7.12 – System Interface Requirements	In Production? YES/NO
Description Addresses Requirements (Provide the range as applicable): 1251-1263, 1665, 1666, 1680, 1764, 1840, 1845	NO

External Interfaces (Unique IDs 1251 – 1263)

Interoperability of the new MMIS is powered by our interChange Connections component that orchestrates interaction of the MMIS with the broader healthcare ecosystem. The functional capability of this module directly aligns to the CMS Seven Standards and Condition interoperability vision. interChange Connections can be used for interfacing with any stakeholder who needs to supply data to or receive data from the MMIS.

- Interoperability with PBM for capitations, encounters, and eligibility data
- Interoperability with enrollment broker for eligibility data
- Interoperability included accept, validate, and edit eligibility data from outside CBMS
- Securely export encounter data to contractors
- Interoperate with Care Management contractor
- Interoperate with COFRS
- Interoperate with BDIM with PBM-related encounter data
- Interoperability with CBMS for client record updates
- Interoperability to link EHR to client data
- Post data analytic reports in case management tool.
- Interoperate with the Case Management Tool for auto prompts to case managers for specific business scenarios

Each of these required data management entities will be managed within the interChange Connections model. The following figure illustrates the role interChange Connections plays as the gateway between the MMIS, related healthcare entities, and Colorado agency systems. Following the diagram is a description of the features that comprise the Connections module.

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A fundamental purpose of the interChange Connections is supporting the integration of the MMIS to external applications and enabling the communication between the MMIS and those applications through defined services. HP is a national leader in HIE implementation and integration services, creating the first EHR in the nation more than 12 years ago.

The following table details interChange Connections features.

interChange Connections Features

Feature	Description
Communication Adapters	Integrating systems starts with the ability to connect and exchange messages through a common protocol. interChange Connections has more than 100 communication adapters available to link quickly to new trading partners and begin transferring data. Common adapters—such as HTTPS, JMS, and secure FTP—are available to support synchronous and asynchronous processing of the Department's transactions. Support for these and other protocols lets us establish communication quickly with the trading partners.

Feature	Description
Security	Security is crucial to enterprises exchanging private information such as an MMIS. interChange Connections uses two types of security when exchanging messages: encryption using an agreed-on public key, or digital signature using a private key certificate. These two methods are industry standards for protecting data.
Routing or Orchestration	The interChange Connections ESB handles simple and complex message processing. In some cases, messages are simply transported to a single service. Other times, the transaction must be guided through many services, dynamically determining the path based on the data submitted and the business rules associated with that data. interChange Connections simplifies the implementation of complex orchestrations and safeguards delivery of messages using a publish-and-subscribe architecture.
Trading Partner Management	Working with external trading partners is an important part of providing a good experience for providers and keeping the system running smoothly. Trading partners will register with HP and test each transaction format for which they want to be certified. After testing is complete, the Trading Partner Management function of interChange Connections will store the trading partner's contact information and a list of the HIPAA transactions the partner can send and receive so interChange Connections can track and verify data exchanges.
HIPAA Compliance Checking	An important aspect of EDI is verifying that incoming and outgoing X12 transactions meet the HIPAA standards. interChange Connections validates X12 transactions for HIPAA compliance as they are received and before they are sent to our trading partners.
Message Translation	Another key component for systems integration is the ability to translate a message into a format that is understandable to the service that will receive it. Whether an X12 transaction or a non-HIPAA transaction, interChange Connections uses a visual point-and-click mapping tool to transform messages to the appropriate format for the system receiving them.
File and Message Tracking	The FTS monitors, tracks, logs, and moves files throughout the interChange solution. FTS provides a complete file audit trail with real-time, processing-stage updates through the file tracking web interface. FTS includes detailed error notifications, which allow quick recovery of failed files.

Feature	Description
Command Console and Business Activity Monitoring	One of the key factors in business success in the right information at the right time, which is where BAM plays a vital role. The interChange Connections BAM lets business users monitor and analyze data from defined business process sources. By using BAM, users can get information about business states and trends in real time.

As shown in the previous table, the features of interChange Connections provide a powerful set of tools that allow HP to quickly create and maintain data exchange interfaces regardless of the exchange protocol or data format.

Reporting Functions (Unique IDs 1665, 1666, 1680)

(1665) interChange has a sophisticated series of automated capabilities to support reporting at the State and federal level with the reliability of interChange Connections managing delivery. The interChange will provide the data to BIDM for production of the State, Federal reports and the CMS certification checklist items.

Besides the data required to support the requirements of the Part 11 of the State Medicaid Manual, we will supply to BIDM the data required to produce financial and utilization reports to facilitate cost reporting and financial monitoring of the waivers, LTC and benefits utilization.

The data transfer is performed on a timely and secure fashion through the interChange Connections module.

The extensive supporting interChange reports and State budget monitoring reports generate from each financial cycle and monthly to support quarterly federal reporting and State fiscal planning at the weekly, monthly, and State fiscal year to-date basis. (1666, 1680) The interChange Voucher Detail that is produced from each financial cycle and its companion the Monthly Budget Monitoring report—coupled with the data provided to the BIDM vendor for report production and predictive modeling.

This series of reports use the system-assigned fund codes and fiscal strings within categories of service, and within quarters to categorize the types of funding by period and financial programs. The interChange financial system is so finely tuned to meet the federal reporting that it handles the fact identifies whether an outstanding AR has been repaid to CMS but not collected yet by the state; however, after it is collected the monies are recorded and reported as State-Only and excluded from the federal reports to avoid returning the funds twice.

For most legacy systems, before the more sophisticated database systems such as interChange were developed, this was a mostly manual, and extremely complex, and time-consuming effort. With the automation of federal and state reporting in interChange, the fiscal staff at the

Department will realize increased time savings to address their own internal analysis and workloads.

BIDM Access through the Web Portal (Unique ID 1764)

HP's interChange security single sign-on solution allows secure access to multiple systems from one web page. The capability will enable smooth access to other systems for authorized users, including the BIDM and the McKesson VITAL care and case management platform.

For an in-depth look at our innovative interChange security solution, please see RESPONSE 38e.

Role Based Security

Each user must register on the Provider Portal with at least one role: provider, delegate, billing agent, trading partner, or out-of-network provider. Each role can be configured with a set of functions that is accessible to its users.

The delegate and billing agent roles are special cases. Role-based security allows providers to create delegates as subordinates and give those delegates access to some or all of the functions the provider role has available, as the following figure details.

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Likewise, a provider can associate with an already registered billing agent and give them access to some or all of the functions the provider role has available.

Background Checks (Unique ID 1840)

HP will conduct background checks on providers' owners, officers, directors, partners, agents, managing employees, affiliates, and subcontractors for sanctions, terminations, and exclusions, in accordance with the ACA Provider Screening Rule. We will conduct background checks after the provider's application, at re-verification, and following Department request. We will, at minimum, use information from the following systems to perform background checks:

- LEIE/MEDEPLS
- NPPES
- Medicare terminations
- Other state Medicaid or CHP terminations
- HHS' healthcare integrity and protection database
- Social Security Administration's Death Master File

We will use LexisNexis to meet the requirements of Rule 6028 of the ACA for provider credentialing and background checks. HP staff members can pull information from a large database provided by LexisNexis that contains public and proprietary records to provide a detailed view of individuals or businesses and their history. This service aids in the investigation process by quickly identifying fraud and other incidents within the last five years that involve the owners, indirect owners, and managing employees.

Additionally, HP will work with licensing and sanctioning agencies to verify that providers meet federal and State enrollment requirements.

We will use electronic interfaces to provider licensing boards and regulatory or certification agencies—such as the federal register—for online, real-time verification, and validation of provider credentials, including employed by enrolled or enrolling providers. We will use the Provider Portal to link available resources. The ability to use the Provider Portal to provide automated interfaces with external systems makes it easier to obtain the required information for provider enrollments and credentialing.

For example, during the online application process, the system will electronically verify licensures. On entry by the provider, the Internet certification-site will transmit the license number to the licensing board for confirmation. License information and effective dates are uploaded to the application data, and the provider will continue the application process. After the provider completes the online enrollment, the information is populated in the Colorado interChange enrollment file.

These verification functions will occur at initial enrollment and following provider revalidation or re-enrollment. The following outcomes may result:

- The verification process identifies inaccurate, inconsistent, or missing information. If so, a return letter is created.

- The application passes the HP verification process and the provider is allowed to proceed with the enrollment process.

HIBI Interfaces (Unique ID 1845)

HP will accept data from HIBI interfaces. The HIBI data exchange interface will be defined during the DDI Phase.

Interface with PBMS Vendor (Unique ID 1874)

HP will develop an interface to transfer pharmacy-related provider data to the PBMS contractor. This data will include new enrollments, updates, terminations, and disenrollments. We will work with the Department to define and develop this interface during the DDI Phase.

RESPONSE 38I

7.13 – Rules Engine Requirements	In Production? YES/NO
Description Addresses Requirements (Provide the range as applicable): 1264, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1307, 1572, 1573, 1574, 1599, 1614, 1628, 1631, 1632, 1633, 1637, 1650, 1661, 1662, 1663, 1671, 1672, 1673, 1674, 1675, 1676, 1678, 1679, 1684, 1685, 1712, 1713, 1716, 1717, 1719, 1720, 1721, 1740, 1817, 1827, 1852	**YES**

When identifying aspects of the interChange MMIS as "In Production," we employed a conservative approach. We identified several elements of the solution as not in production even while aspects of those components have been running in production in multiple states for years.

For example, HP has used the Corticon rules engine in production of our North Carolina PASSR screening solution for several years. We also have made use of other COTS rules engines for solutions such as our Oklahoma member enrollment solution. But for this next-generation interChange MMIS solution, we are working on the integration of the Corticon business rules engine to the specific business areas of the MMIS currently. This integration work is a coordinated effort between our teams working within the HP labs environment as well as our current MMIS implementation teams. While we are actively working on

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Video demonstrations of the scenarios Health Benefit Plan Scenario in RESPONSE 41, New Client Population for Existing Health Benefit Plans Scenario in RESPONSE 42, and Hybrid Fee-for-Service and MCO Health Benefit Plan Scenario in RESPONSE 43.

A video demonstration of additional scenario Business Rules Management is included in RESPONSE 47.

the rules integration for select business areas of the MMIS, our interChange Business Policy Administration rules engine has been in production for more than seven years. This rules engine was specifically built and maintained for the unique rule challenges and volume processing of claims and encounters.

The workflow for rule approval also will be a new part of the overall MMIS workflow capability which is not currently in production. The interChange MMIS, as its name implies, is about change—or continual evolution as MITA envisions it. The proposed Colorado interChange MMIS is a production-proven application that has been certified by the latest CMS checklist. It is that core that is shared for the Department's benefit and enhanced through the proposed architecture improvements

Why the HP Business Rules Approach is the Best Solution for the Department

CMS 7 STANDARDS Most organizations are seeking to increase the speed of change and reduce the complexity of information systems, and a proven approach is to simplify maintenance and implementation of system changes using a rules engine instead of relying on developer customization. This approach to make a system modular is so important that CMS has defined Modularity as one of its Seven Standards and Conditions (7SC). HP's use of rule engines in Medicaid systems predates the establishment of the 7SC and many of the MITA guidelines.

Many information systems rely on a general-purpose rules engine that can be deployed in various business scenarios. The flexibility of the tools enables deployment of the same applications to support multiple business areas within an organization. This reduces training, enables use of rules across multiple domains, and standardizes the methodologies for implementing rules-based processing.

In some circumstances, it is beneficial to supplement a general rules engine with a purpose-built rules engine. Purpose-built rules engines enable increased flexibility of rule definition while also enabling high-volume transaction processing and traceability.

The proposed Colorado interChange MMIS offers the best of both worlds by incorporating a general-purpose rules engine available throughout the system and a highly optimized rules engine used to administer the business policy of claims processing. These tools are used to make the Colorado interChange MMIS both flexible and efficient, even when processing large volumes of data. We have a history of innovation including processes to optimally define, maintain, and apply rules in a consistent and tightly controlled manner.

> The proposed Colorado interChange solution goes beyond by providing online traceability of the rules applied to each claim. This capability enables faster research into the rules applied during processing.

Meets Department Objectives and Goals

The Colorado interChange MMIS directly maps to the Department's objectives and goals for the MMIS—specifically the objective of a highly configurable and flexible rule based processing platform. The interChange business rule solution delivers on the vision of CMS 7SC. From the MITA Condition to the Modularity, Leverage and Business Results conditions, our innovative rule based processing solution provides human readable rule presentation and the ability to export the rules to a repository.

Web-Based Rules-Based Engine (Unique IDs 1264, 1271)

(1264, 1271) The interChange approach enables pre-adjudication rules to be configured and maintained by business analysts through our web-based interface. While the use of an engine has only recently been mandated by CMS through the publication of the 7SC, HP has used business rules engine concepts within our MMIS solution for more than a decade. The CMS vision of the business rules engine is defined in the 7SC with the following text:

CMS 7 STANDARDS

Use of business rules engines. States should ensure the use of business rules engines to separate business rules from core programming, and States should identify and document the business rules engines used, the manner in which the business rules engine(s) is implemented in the state's architecture, the type of business rules engine and the approximate number of rules the business rules engine(s) executes for a given business process.

Submission of business rules to HHS-designated repository. States should be prepared to submit all their business rules in human-readable form to an HHS repository, which will be made available to other states and to the public.

The Colorado interChange MMIS is aligned to the CMS 7SC vision of the use of a business rules engine to implement policy for improved system management. Additionally, interChange meets the RFP requirements of using a COTS Business Rules Engine within the MMIS. The Colorado MMIS solution includes the Corticon Business Rules Engine for general low-volume rules processing, and our purpose-built claims processing rule engine specifically for the state healthcare market. Both provide human-readable rules and are capable of being exported to a HHS rules repository.
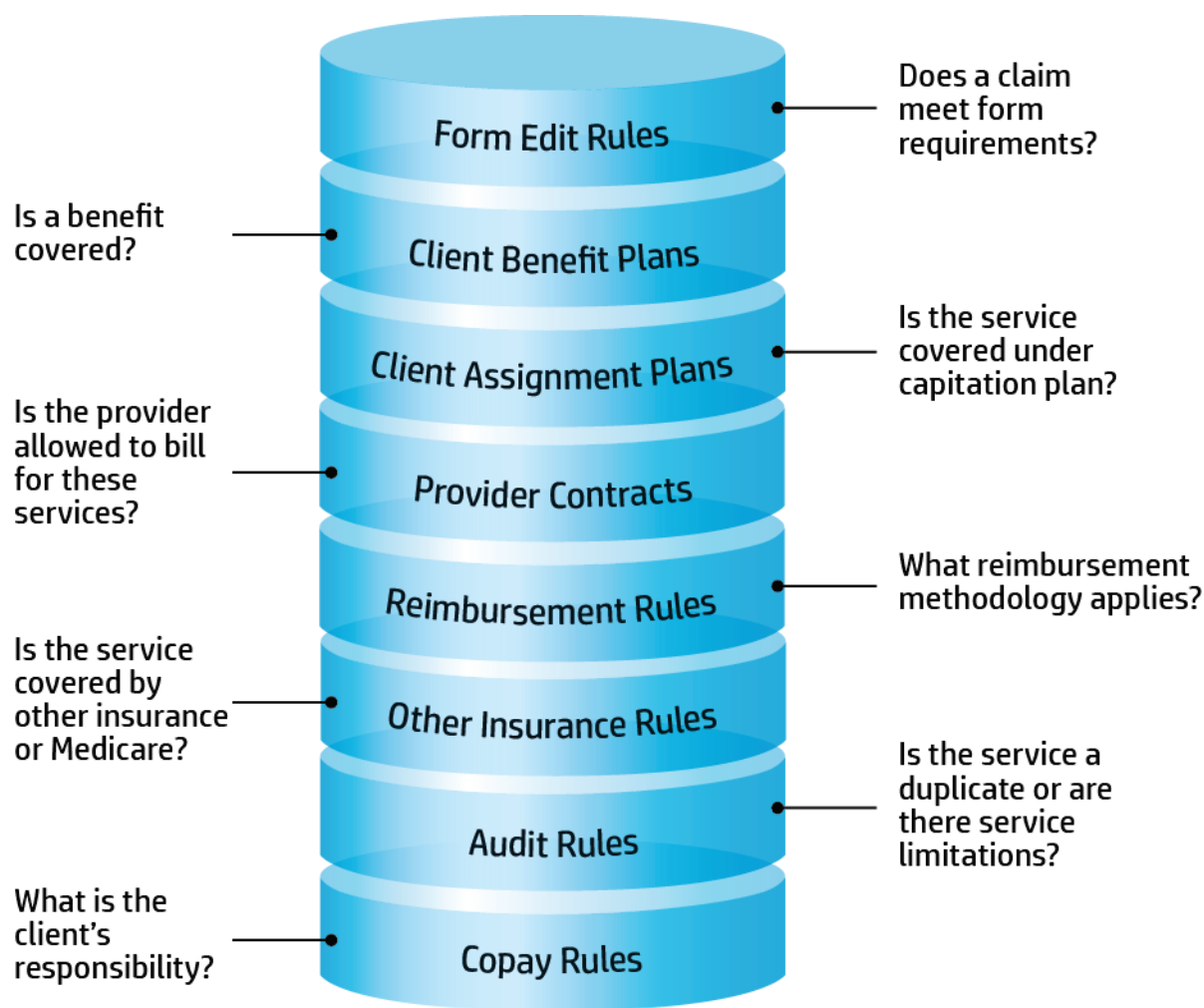
Business Rule Management

interChange Business Policy Administration (BPA) rules are responsible for claims adjudication, pricing, editing, and auditing decisions. The configurability built into BPA rules gives the Department the flexibility and scalability to use the Colorado interChange MMIS for pre-adjudication transaction processing for multiple programs across the MMIS enterprise.

The BPA rules engine defines and processes these rule types:

- **Provider Contract Rules**—The services a provider is allowed to perform
- **Client Plans Rules**—The services a client is eligible to receive
- **Reimbursement Rules**—The decisions on appropriate pricing methodology to apply
- **Assignment Plan Rules**—Services to carve-out of a capitated managed care plan
- **TPL Rules**—Services are covered by carrier-specific rules allowing cost avoidance and recovery
- **Edit Rules**—Most edits are rule-driven through configuration
- **Audit Rules**—Most audits are rule-driven through configuration
- **Co-pay Rules**—Client responsibility amount

The following figure shows how a claim will move through BPA rules engine. It shows the extensible nature of the rules and the business questions the rules address.

interChange BPA Rules Flow

The authorized user can export, manage, and maintain the rules in a human-readable form. They also can publish them to an external registry, such as an HHS repository, leading to a more standardized mode of operations between states. This fully supports a "reuse and reduce" practice and enables the transparency of the processing logic. As mentioned, extending rules throughout the system, beyond BPA is handled through the integration of a general purpose rules engine from Corticon.

The nature of managing changes to the processing rules of the MMIS has altered compared to historical MMIS solutions that had the business rules buried in program code. Instead of a technical resource making a coding change, through the interChange BPA Rules Engine the work is now performed by business analysts to define and maintain the business rules.

This approach makes changes faster and by defining the rules within the rules engine it is essentially self-documenting the processing logic for the transactions. But having a rules engine and effectively using it within the MMIS are two different things. To best explain the full circle business rules management approach that Colorado interChange brings to the Department, we offer a step-by-step rules management example documented in response to the RFP requirements.

> Self-documentation by having the rules in human-readable format meets the CMS vision and makes everyday research into the rules much easier for the business analyst.

The interChange business rules engine enables the ability to implement in real-time newly defined rules and have those rules apply immediately.

Business Rules Management Example

While the case study illustrates the potential to have immediate impact through interChange, our best practices suggest that careful management of the rule base is critical for tight control and communication regarding the defined MMIS program policy. To that end, we offer the following step-by-step explanation of how to update MMIS business rules. This eight-step process provides the mature business process management of rule configuration in the MMIS.

Step 1: Business Team Receives Policy Change Request

Rule Management Actions—The team receives the request for change, understands request and through the interChange user interface navigates to proper Rule Type/Rule Set. The interChange user interface presents a representation of the rules through a highly malleable rule sheet. By default, this rule sheet presentation is read-only, preventing inadvertent changes.

After validating that the rule sheet is not already checked out, the analyst can check out the rule sheet for this rule type or rule set to allow editing.

> **Business Rules Case Study**
>
> From our operational room at start of kickoff, the State and HP personnel monitored the start of the new MMIS. As part of the monitoring activity, staff members noticed that a newly defined policy was causing an unexpected high denial rate for claims. The lead state manager asked if the rule was processing correctly. Our business policy administrator quickly validated that the rule was processing as defined by the business policy. The lead state manager requested that the new policy rule be turned off immediately. Through the interChange rules engine, the business policy administrator updated and promoted the rule to production. On the review of the next set of claim reports, we validated that the rule had been turned off and the next claims processed with the new rule base.

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Choices for Active Rule sheet include download a copy, check out a draft, or simply view in read-only mode.

Step 2: Business Analyst Checks Out Rule Sheet

Rule Management Actions—The business analyst can check out a rule sheet—as the following figure details—and make a copy of the sheet into a working table with a status of "D"raft. The original sheet remains unchanged with a status of "A"ctive. It is possible, based on a user interface control, for a user to look at either the Draft or Active spreadsheet. The rule sheets are a representation of the rules, but the claim engine does not process against the rule sheets themselves, but processes against the rule tables. Additionally, checking out a rule sheet locks it and prevents other users from making changes to that particular rule sheet until the checkout is discarded or the rule sheet is approved and loaded through the special BPA loader program. The BPA loader program performs the proper loading of the rule data from the rule sheets into the rule tables. It is the loader program that will set the rule sheet status back to A, indicating that the sheet and the rule tables are in synch.

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For a rules engine to be effective, there must be advanced capabilities to navigate through the thousands of rules that are used when processing the high-volume transactions of the MMIS. The interChange BPA Rules Engine provides this capability to ease the research of how to best update the rules for the change requested.

Step 3: Uses interChange User Interfaces to Review, Filter, Group, and Manipulate Draft Rule Sheet

Rule Management Action—Unlike rules engines that are not fully integrated within the MMIS, the interChange BPA Rules Engine is integrated directly with the user interface that simplifies how business analysts work with the rules management. The interChange user interface allows significant control presenting, grouping, and filtering the rules within a rule sheet through many controls. Visibility and comparison is focused to a single rule sheet at a time. The rule sheet holds rules and their relationships for this rule type and rule set across code sets (Procedure, NDC, DRG). They are always managed as a complete entity although the view of them can be constrained to the perspective the user. A user can view the rules only from a single code set at a time because the code sets are treated as peers.

The interChange BPA Rules Engine contains the following options for rule sheet display:

- **W/Rules Only toggle**—Users can toggle between only showing services or nodes (benefits) in the hierarchy that have a rule written against them or else showing the services within the scope if they have a rule.

- **Abbreviated Rule toggle**—This feature shows the content of the rule in a single string using abbreviations verses showing the contents of the rule on a line per attribute with expanded names.

- **Descriptions**—This feature hides or shows the description of the service or node in the Benefit column.

- **Show Children toggle**—This features shows the rules under this node and children, grandchildren and ancestor nodes within scope verses simply showing rules at the level in focus and one level down.

- **Active Rules Only toggle**—Shows only active rules that have an end date greater than three months ago—may eventually make the look-back period configurable—versus showing active and inactive rules. Inactivated rules are not the same thing as an active rule that happens to be for a historical date of service. Inactivated rules represent "deleted" rules— ones that never should have been written. It is most common that this will be toggled to active rules only.

- **Group dropdown**—This feature lets the user select attributes within this specific rule type— such as claim type, end date, or place of service—and group the rules with matching values in that attribute. This feature is powerful for research because it reveals which rules, if any, are restricted to children by grouping on the age range.

The following figure illustrates that the analyst reviewing the rules has selected the "abbreviated rule" presentation mode. This is commonly done to reduce the amount of information presented for each rule. Under the Business Rule column the analyst can see which rules are labeled as excluded.

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The following figure of the rules engine depicts where the analyst has elected to include the description and the children of the rules. The folder menu on the left helps the user understand at what level these rules are documented concerning other rules in the repository.

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Step 4: Analyst Edits Draft Rule Sheet

Rules Management Action—When the analyst chooses to edit a specific rule with the edit wizard, an intelligent user interface appears to guide the rule development. Only valid values from valid attributes for this rule type are allowed. Various pick-lists, calendars or drop-downs check to verify that only appropriate values are selected. Users must save between rules. If the user wishes to add an allowable attribute that is not part of this rule sheet for the rules, the user interface will allow them to add that attribute—for example, gender—to the rule sheet. The user interface editor—shown in the following figure—will automatically change to include the validations for that additional attribute. This is because the rule sheet and user interface are reading the metadata associated with this rule type. This same metadata affects how the claim engine processes the business rules.

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The edit rule user interface is auto-generated based on the attributes used by any rule within this spreadsheet and performs the same validations as the current BPA user interface windows do.

Step 5: Copy or Paste rules Between Benefits Within a Rule Sheet

Rule Management Action—Analysts can copy a rule from one benefit (service or node) to one or more services or nodes within the same rule sheet, retaining the rule's content and avoiding rekeying. The content of the rule—except the rule number and benefit—is copied. The copied rows may then be edited, if desired, to change dates or other attribute values.

Users can select the row they want to copy by right-clicking to bring up the context menu, and then select Copy from the menu.

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The system highlights the row to copy.

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As we detail in the following figure, users can select the rows they want to copy to by holding
the ctrl key while clicking on a line.

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Users can right click to bring the context menu back up then select Paste, as we detail in the
following figure.

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After users select Paste, it will copy the rule in yellow/green to the rows they selected in orange as the following figure highlights.

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Step 6: Review Rule Differences

Rule Management Action—When analysts download a rule sheet, the system performs two actions. It saves an Excel workbook of the rule sheet into a selected location. It also adds a new tab to that workbook that identifies the differences between the Active rule sheet and the downloaded rule sheet. The Differences tab only shows rules for which at least one element is added, changed, or deleted between the downloaded rule sheet and the corresponding active rule sheet. This table indicates the action and impact of the action.

Action	Impact
Strikethrough	Value was removed or modified.
Under Line with Red Font	Value was added.
Otherwise	Value not modified.

Unchanged rules are hidden from this view. New rules, deleted rules, and changed values are color-coded for ease of interpretation. Note—this "Difference tab" is only generated on a download and is only viewable in the Excel version of the downloaded sheet. It is not visible in the user interface. An analyst may upload and download a draft sheet multiple times if necessary.

For the next available action, users review the Difference tab, review the Validation Errors tab, edit the draft spreadsheet within Excel, and upload the draft.

The following figure shows the Differences tab of the downloaded rules sheet. It is easy for the analyst to see which rules have changed based on the underscores and strikethrough text.

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While this presentation of updated rules seems simple, it is actually a powerful feature of the interChange BPA Rules Engine. The MMIS features thousands of rules, but often updates are to specific rules or groups of rules. The differences tables filter out the rules that remain the same so that the quality control review can focus on just those rules that have been updated. The focus for the quality review is exactly on the rules that require attention.

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Rules have effective dates for when the rules are to be applied. The rule effective dates define for the system when the rule is used in the processing logic. Within the rules are additional effective dates such as Dates of Service that can provide further flexibility of how to apply rules in a tight policy manner. The following details a rule sheets status indicating errors.

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Step 7: Upload Rule Sheet

Rule Management Action—Several actions are performed when a rule sheet is uploaded. First, a validation routine is run on the rule sheet, comparing each cell to the attribute type and performing validations for valid values. Errors found are written to an Error tab on the Excel workbook. It must be downloaded to be seen as it is unavailable within the user interface. If there are errors, a third version of the rule sheet is stored in the database with a status of "V"alidation errors. The "A"ctive and "D"raft versions of this rule sheet remain unchanged. If there were no validation errors encountered, then the existing draft version—if it exists—is simply overlaid with the uploaded version. This is a destructive write. The old version will no longer be available. A successful upload without validation errors will delete a matching rule sheet in the "V"alidation error status.

Step 8: Submit for Approval

Rule Management Action—The analyst selects the Submit for Approval button and begins a workflow process that references the BPA Rule user interface and Workflow engine. Analysts can submit notes and comments and upload an Excel workbook that includes the Difference tabs. The approver can review comments, Excel worksheets, rules within the user interface, or other supporting information.

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DEPARTMENT AND HAS BEEN REDACTED

Approver verifies work as submitted. After the approver has approved the changes, then the rule sheet may no longer be edited. On a defined schedule, the BPA loader program will pick up the approved rule sheets and perform the load process which will update the rule tables with the data from this rule sheet where they will be available for processing. The loader program also creates an "A"ctive copy of the rule sheet for the user interface to present. The model office/simulation environment will be populated with scrubbed production data as a means of testing the rules against real data. In the production environment, rules are typically procedurally updated daily but can be implemented immediately.

Summary of the Rules Management Process

The management of the rules within interChange is a well-structured, process-driven activity that is easy to follow but provides the quality control required of such critical metadata as the rules by which the program is managed. Through this step-by-step process description, we have shown that the process helps facilitate the management of change that is critical given the number of rules managed for the program.

Configuration Rule Specifications (Unique ID 1267, 1274)

(1267, 1274) The interChange MMIS allows rules to be configured with date specificity. The date the rule is added is immediately captured following rule creation and the date is modified whenever the rule is changed. The MMIS allows the user to specify the start and end dates of service, the start and end processing dates, and effective date for each rule.

Business Rules Documentation (Unique ID 1268)

Every rule configured in the BRE will go through a design process that includes documentation of the configured rules. Each business rule set is closely examined to determine which rules need to be in place to generate the desired outcomes, particularly regarding workflow decisions and task routing. For example, the exception handling rules for claims processing edits and audits are captured for each error code. The method of correction specifies these exception handling rules and are available online for the claims resolution analysts.

Exception Handling Rules Training and Training Documentation (Unique ID 1269)

HP will provide ongoing training and training documentation on exception handling rules. The interChange MMIS stores the method of correction that identifies the step-by-step instructions for the exception handling rules for claim edits and audits. This documentation is available online for consistent application of Department policy. Additionally, the MITA business processes for each functional area are documented in the interChange MMIS and include step-by-step instructions along with prerequisites and outputs. The method of correction instructions and the MITA business process documentation can be updated per Department policy and are used for training purposes.

Rule Usage, Exception Usage, and Rules Failure (Unique ID 1270)

Traceability of which rules applied to the claim is critical. interChange maintains as part of the permanent claim record a history of the rules that were applied in the processing of each claim on the Decision Rules tab. In the following figure, the business analyst can see on the Decision Rules tab the rules that applied to this claim when adjudicated.

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Every rule that was used in the processing of the claim is presented on the decision rules tab along with the order in which they were applied and the level they were applied, either header or detail. As shown in the preceding figure, some of the rules applied included "reimbursement," "other insurance," and "audit" rules. To get additional information about the particular rule, users click on the rule they are interested in and in a separate window the business rules editor will be

displayed with the selected rule highlighted. The following figure displays the resulting window of a user clicking on a business rule in the previous figure.

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The rule that was clicked is now highlighted when displayed through the benefit policy editor. The English presentation of the rule is displayed, making research quick and easy for the analyst. The ability to quickly navigate from the claim to the specific rule greatly enhances the user's ability to quickly and accurately perform research and assist providers and clients.

Rules Engine User Interface (Unique ID 1271)

As answered during our reply to Unique ID 1264, the Colorado interChange MMIS provides a browser-based interface that enables business analysts to configure and maintain the business rules and view the rules that applied to the detailed transactions the MMIS processes.

Program-Specific Alerts (Unique ID 1272)

The following figure shows the various types of alerts that can be generated by the MMIS solution.

interChange-Generated Alerts
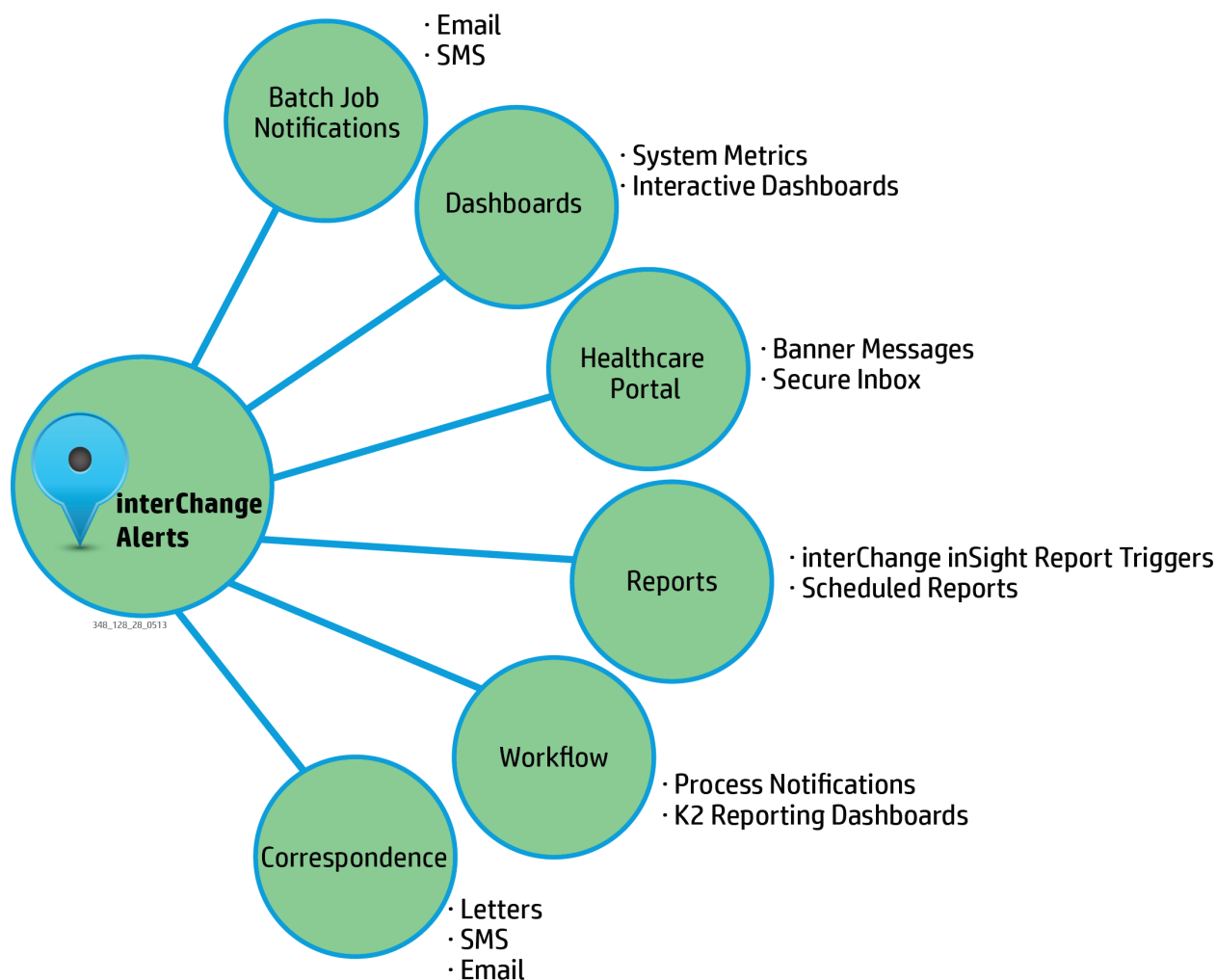
Specific to this requirement, interChange provides the ability to set program-specific edits using the BPA user interface. Edits can trigger alerts to the client or provider in the form of letters or reports. HP's correspondence generation solution includes the ability to generate email and SMS notifications to MMIS stakeholders. Our innovative interChange inSight dashboard reporting solution also will allow configuration of automatically triggered reporting using Microsoft SQL Server Reporting Services.

HP will work with the Department during the BPR and requirements validation phases to define the alerting requirements and balance timely, targeted alerts with the potential for flooding stakeholders with unnecessary notifications.

Documentation Linking Business Rules in the Rules Engine (Unique ID 1273)

The Colorado interChange MMIS allows the linking of an authorization code to reference file updates and Business Policy Administration rule sheets. The authorization code is linked to the

type of authorization that is a configurable item. The authorization type could be items such as policy, legislative directive, or change orders as shown in the following figure.

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The supporting documentation related to the authorization code will be stored online in SharePoint, linked to the change order, and available for research purposes.

Implementation Rules Scheduling (Unique ID 1274)

Because the Colorado interChange allows the user to set the rule with an effective date, and end date if required, the Department can set the date of the business rules implementation date in the MMIS. The MMIS allows the user to specify the start and end dates of service, the start and end processing dates, and effective date for each rule.

Cloning, Modifying, and Implementing Rules (Unique ID 1275)

The interChange MMIS allows authorized users to create rules and modify them as new separate rules at multiple levels as the following figure indicates.

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Rules created at the higher levels such as All Procedure are inherited by the underlying subgroups—for example, CPT and HCPCs. This feature enables users to create a global rule that applies to most of the procedures than simply modifying the rule for the few procedures that have different requirements resulting in less rules and minimizing rule maintenance.

Additionally, the BRE provides the capability to copy rules, change them, and implement then as new separate rules. Please see our explanation of Step 5 in the Business Rules Management Example in our response to Unique ID 1264 for details on the copy and paste feature within a given rule sheet.

Authorized users also can copy entire BPA rule sheets from one benefit plan to another benefit plan. They can then make modifications to the new rule sheet if necessary to meet the requirements of the new benefit plan. This feature enables the reuse of rules when benefit plans have the same or similar coverage.

Rules Exception Configuration (Unique ID 1276)

As we discussed earlier, Colorado interChange provides the authorized user the ability to configure the dates for the business rule and exceptions, to be specific for the start and end dates of service, the start and end processing dates, and effective date for each rule.

interChange Business Process Management

The process management and subsequent business activity monitoring (BAM) solution is an innovative approach that drives business maturity. interChange workflow is a single workflow engine that is enabled throughout the MMIS business areas. Within each business area such as provider, client, or CTMS, the MITA Process Triggers are business area-sensitive. This means only the specific workflows that are configured to appear for that business area are displayed. This

focused presentation of the MITA Process Triggers makes navigation of the options easier for the user community.

Different user interface screens can act as the initiation point for different workflows, allowing users to trigger the proper workflow based on the activity performed. It is not necessary to navigate to a centralized "Workflow Initiation Screen." Business analysts can define numerous process triggers in the interChange Form Builder. Workflow forms allow users to enter workflow-specific data such as case notes or attachments that support the business process. Within the interChange Form Builder, we can select from predefined workflows configured through our COTS solution, K2 blackpearl. The following figure depicts the workflow initiation is as easy as clicking on the hyperlink within the @neTouch menu on the left panel of the screen.

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When the user clicks on the workflow trigger link, the process is initiated by the Workflow Initiation Form popping up for data input. The following figure details this workflow data entry form. The form contains data fields, such as priority and reason, representing the information necessary to complete an investigation of this type. The claims adjuster will input available information before submitting the request.

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Features such as these increase the efficiency and accuracy of Colorado interChange users. The previous figure depicts the additional tabs included with the workflow form. Besides the main data page, users can navigate to additional pages to include notes and attachments. Submitting the Request TPL Review form triggers workflow, saves form data into workflow databases, and sends it to the work list queues of the group assigned to TPL investigations.

TPL Review—Work List

The primary user interface for workflow participants is the Work List screen. This primary interface simplifies navigation, facilitates data access, and increases the productivity of staff members. The following interChange Work List figure depicts the Work List window within interChange.

The workflow engine creates a pool of tasks that the authorized users can select from. The initiation of this work begins the process of assigning and routing the workflow item and its associated metadata as defined in the process flow definition. Automatically distributed notifications inform users they have work to be performed. The workflow engine enables the setting of priorities and displays alerts of tasks that are about to go late or have exceeded a defined threshold. As part of the workflow engine escalation, flows can be defined directly within the workflow such as when a deliverable review period has been exceeded or when the anticipated response to a letter has been exhausted. In these cases, the workflow can take the next automatic function to escalate workflow to the next step as defined by the business. The tasks remain in the work list until they are completed—they cannot be lost, ignored, or deleted.

The Work List screen presents the user with a list of assigned tasks. In the following figure, the analyst has grouped the work list items by the carrier ID to better facilitate a call to that company and through one call take care of the set of follow-up items specifically for that carrier. By being able to change the organization of the work list data dynamically, users can configure the list to optimize their work efforts. Each list item represents the next workflow step to be completed. Tasks are assigned to users based on that specific user's group memberships, which can be tailored to reflect departments, business areas, or even individual task specialization.

MMIS staff members can view and update workflow tasks in the familiar environment of the Colorado interChange MMIS. Additionally, staff members also can receive notifications and participate in workflow review and approval as desired. The TPL Review task is now on the work list of TPL investigators with a status of "Available." When an investigator accepts a task, it is removed from the work lists of other investigators.

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Coordinated Workflow Processing

Accepting and opening the workflow task will open the Work Task Detail window, detailed in the following figure. The data entered by the claims adjuster is available along with notes and attachments. Data collected to support a workflow—for example, the provider application and enrollment data—is held with the specific workflow instance in a workflow database until the workflow is completed. Then the data is saved into the Colorado interChange MMIS database. This approach allows the data to be reviewed, updated, and approved before it is written into the

production database. Data is retained in the MMIS database for historical research and playback of the workflow execution.

At the top of this window is a bar with a menu of actions that the investigator can select while working through this workflow. The workflow engine dynamically presents the available actions appropriate for the current workflow step. The system guides users through the process so they apply consistent business processes in their work. Additionally, our workflow solution accelerates new user training because the system restricts choices to the logical next steps and provides a graphical road map of the process in the ViewFlow screen.

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TPL Review—ViewFlow

A key feature of the Colorado interChange workflow solution is the process flow view of workflows in progress. As depicted in the following figure, users can view workflows that are in progress, see the completed steps, and determine which steps remain. This interface is available within the workflow window through the ViewFlow action button on the menu bar. This is helpful to allow a participant with a task in the middle of the flow to see what has happened in previous steps.

The interChange MMIS workflow solution transforms workflow from an abstract concept to a user-centric, high-business–value capability. ViewFlow mode provides the "big picture," showing what has been completed and what will occur next. Having this pictorial presentation of the workflow process aids in the education of new business analysts who are trying to understand the overall process and how their task fits within that flow of activity.

The ViewFlow is available for in-process and historical workflows, allowing reviewers to determine exactly what path a given instance of a workflow followed, even months later. Processing data is retained for every work instance. This data supports research or dispute resolution should the need arise.

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This ViewFlow depiction of the workflows provides an innovative method of providing visual guidance to the business users who now see how the business process steps relate to each other. The flow of the workflows and the respective view flows can be configured and customized to meet local business policies. This includes the ability to define and configure workflows of security alerts. The security alerts workflow capability and features would parallel the workflow engine capabilities described in the TPL example detailed in this section. This single workflow

engine, integrated with the Colorado interChange MMIS, is flexible enough to provide comprehensive workflows across the MMIS business areas. The final aspect of the business process management engine is the ability to analyze the efficiency of the processes. The following section details the transparency the interChange BAM provides to the Department and HP leadership team.

interChange Business Activity Monitoring

At the managerial level, the interChange workflow engine provides in-depth reports and ad hoc capabilities that provide information about staff workload and productivity at an enterprise level. Such data will help managers identify bottlenecks in processes. Managers can drill down to the individual level to determine productivity measures or compliance to service-level agreements (SLAs). The workflow web services store key performance metrics in the BAM repository database, allowing transparency into business processes.

At predetermined steps along the way, logging points built into the workflow services collect and store information. This allows the dashboard to graphically present the key performance indicators (KPIs) and SLA categories related to timeliness, throughput, approval, and denial percentages for workflow-enabled business processes. The interChange MMIS workflow drives efficiencies by presenting real-time or historical metrics in the form or graphs, pie charts, and more. It also provides the key inputs to improve workflow processes based on that information. Analysis of these reports can help identify exactly where business processes can be improved, enabling evidence-based enhancements in the business process.

Managers can use the following five predefined workflow reports:

- Activity statistics
- Process statistics
- Process information
- User performance
- Process overview

The following figure depicts the process overview report that drills down into a single workflow instance. The report details the statistics such as completion time for each step of the workflow process.

One of the most powerful features of our workflow solution is the ability to visually analyze workflow information in real time. This will allow the Department to adapt business processes in response to data gathered from the field.

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The following figures depict the activity and user performance statistics reports. These reports display the productivity statistics associated with an individual step in a workflow process or a user. Managers can use this information to determine easily which workflow steps may be a roadblock in business processes and update to increase efficiency.

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Managers also can identify individuals who may need additional training or support to complete certain workflow steps. Users may "drill down" into key data and customize reports providing ad hoc information to aid in business process management.

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One of the key benefits of the interChange workflow solution is its ability to provide transparency into the real metrics of the business processes and the team members working the processes. MITA is about continual evaluation and improvement of business processes, striving for continued maturity of those processes. Now, through the interChange MMIS workflow and business rules solution, the ability to make informed decisions based on real metrics enables continual improvement of business results.

Adding or Updating Valid Values (Unique ID 1307)

The Colorado interChange MMIS uses role-based security to control access to the database and supporting tables without the need for customization. Users will be granted the appropriate access based on their role to add and update valid values.

Provider Preventable Conditions (Unique ID 1572)

The interChange MMIS provides the ability to deny claims whenever a Present on Admission indicator on the claim indicates a Provider Preventable Condition such as Stage III and IV pressure ulcers or air embolism. The exact logic used will be reviewed during DDI with the Department.

Outlier and Provider Peer Group Pricing Options (Unique ID 1573)

The reimbursement rule type within the BPA rules provides the capability to define the reimbursement methodology to use during claims and encounter processing. The interChange MMIS supports the pricing methodologies of inpatient Diagnosis Related Groupings (DRG) and Enhanced Ambulatory Patient Grouping (EAPG) System. For both the DRG and EAPG methodologies, the provider can be reimbursed using peer group pricing or a provider specific rate. Outlier calculation and payment is available for both DRG and EAPG pricing.

Claim or Encounter Denials (Unique ID 1574)

HP exceeds this requirement. The configurable member benefit plan rules allow authorized users to determine the coverage requirements. The user can configure a rule based on a list of "uncovered" diagnosis codes and in which position the diagnosis code appears—primary, secondary, and any position both at the header and detail level. For example, the rule could deny services when the primary diagnosis code is in the list of "uncovered" diagnosis codes and to allow the service if it is not in the list.

Encounter Validation Criteria (Unique ID 1599)

Form edits are one of the rule types within the interChange BPA rules engine. This rule type allows authorized users to specify the rules for a valid encounter by form type such as professional, inpatient, outpatient, durable medical equipment, and pharmacy. The user can specify what fields are required and the acceptable values. The rules can vary depending on the client's benefit plan.

Payment Suspensions for Ineligible Clients (Unique ID 1614)

When a claim processes in the interChange MMIS and the client is not eligible for the Colorado Medical Assistance program or for a specific service, the appropriate edit will post to the detail or entire claim. The flexible disposition tables enable authorized users to specify the outcome for each edit. The user can deny the edit or suspend for manual resolution. If the Department's direction is to provide payment, the claim can be manually priced.

Client Diagnosis Code Validation (Unique ID 1628)

The interChange BPA rules engine provides the capability to specify the acceptable diagnosis codes for a service. When a claim is submitted and contains a diagnosis that is not acceptable, the appropriate edit will post. The flexible disposition table specifies the outcome of the edit—suspend for manual review, deny, or pay.

Health Benefit Plan Limits (Unique ID 1631)

The audit rule type within the interChange BPA rules engine provides the capability to configure the rules related to Department-defined limits. The limitation can be based on units, hours, or dollars and applied across multiple claims for the specified time period. Additionally, the limitation can be for a specific benefit plan or across multiple benefit plans.

TPL Coverage (Unique ID 1632)

The interChange MMIS edits the benefits, services, and benefits utilization services for third-party liability (TPL) coverage before payment. For each client with TPL coverage, we maintain the policy information including the type of coverage—such as medical, dental, or inpatient. The other insurance (OI) rule type within the interChange BPA rules engine specifies when a particular service is covered by the primary insurance. For example, if an eye exam is only covered with a diagnosis of cataracts, the rule would reflect that requirement. This allows only those services covered by the primary insurance to be denied and cost-avoided, reducing the burden on the provider to bill known non-covered services to the primary insurance while verifying Medicaid is the payer of last resort.

OI Coverage (Unique ID 1633)

When defining the rules for third-party liability or other insurance (OI) coverage in the interChange MMIS, the user specifies the outcome if the detail or claim does not meet the rule. The acceptable outcomes are deny, pay, pay and report, or suspend. Details or claims with a deny status are cost-avoided and the details or claims with a pay and report status are marked for the pay and chase process. The OI rules can vary depending on various elements including the age and benefit plan of the client, procedure code, family planning indicator, and category of service. This feature enables States to reduce billing hassles for providers by only requiring providers to bill the primary insurance or Medicare for those services known to be covered by the primary insurance carrier or Medicare.

Trauma Indicators (Unique ID 1637)

The Colorado interChange MMIS provides the capability to designate diagnosis codes as trauma or accident related. The MMIS then flags claims with the appropriate diagnosis codes as part of a potential TPL case. Using the case-tracking panels in the interChange MMIS, authorized users can determine and indicate which claims to include in the case.

Payment Methodology and Health Benefit Plan Accounting Codes (Unique ID 1650)

In the interChange MMIS, financial transactions including claims—whether priced at the detail level or at the header level for institutional claims—are assigned a fund code as shown in the next figure.

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The fund code is an accounting code associated with the federal and State share of funding supported for that service within the Health Benefit Plan of the client. Fund codes support the federal claiming on the CMS fiscal reports; and the State budget reporting needs, as defined by the State users at the State budget appropriation or lowest level of fiscal reporting needed by the State—for example, an organization or project level reporting for specific waiver.

New Accounting Codes (Unique ID 1661)

FUTURE VISION

The interChange MMIS is a truly multi-payer system that can support many programs within the same financial cycle or separate financial cycles with a different set of fund codes. As new programs for State legislative or federal mandates require changes, the Colorado interChange system's highly configurable business functional areas interact with each other to provide a smooth transition in coverage definitions by population, rendering provider, and other criteria. These changes are effective date–specific at the date of adjudication or date of service level and provide the updates of the federal and State shares because of the changes required.

When the federal fiscal year or State fiscal years change, the new funding is loaded into interChange with the previous versions still available for retroactive features as needed. For new health programs, Colorado interChange offers the ability for the new services and program to be merged or separated for coverage definitions with benefit plans, pricing, funding, and reporting as requested by the Department.

Financial Cycle

A financial cycle is a grouping of fund payers as it relates to the processing of transactions within a financial batch cycle. This level of association allows the MMIS to assign rules and attributes to a group of fund payers as it relates to transaction scheduling, payment, bank reconciliation and account receivable recovery. Examples of a financial cycle would be Medicaid, WCDP and WWWP.

Fund Payer

A fund payer is an entity defined in the financial subsystem as the payer as it relates to the fund codes assigned to claim and financial transactions. This level of association provides the ability to control processing and reporting of transactions based on fund code. Examples of fund payers would be renal, hemophilia, and cystic fibrosis.

Fund Codes

Fund codes are associated with a specific financial cycle and based on predefined, static criteria such as the following:

- Transaction type—such as claim, capitation, expenditure, and account receivable
- Procedure code
- Assignment indicator (formerly MCP code)
- Claim dates of service
- (State) category of service
- Benefit plan
- Race or ethnicity code

  – Assigned to batch transactions—such as claim transactions, claim adjustment transactions, capitation transactions and OBRA Nurse Aide transactions—in the batch cycle by a financial subsystem controlled program

  – Assigned to financial transactions—such as expenditures and accounts receivable—either by the system batch processes or directly through the user interface panels

Nationally Accepted Medical Review Criteria (Unique ID 1662)

The highly configurable Colorado interChange MMIS provides the ability to implement claims and encounter edits based on nationally accepted medical review criteria. Through the flexible BPA rules engine, authorized users can create the specific edits and audits related to a client benefit plan or provider contract such as procedure versus provider type conflict edit.

Additionally, if the criterion is not specific to a client plan or provider contract, the authorized user can create restrictions at the procedure or diagnosis level such as procedure versus gender conflict.

Health Benefit Plan Services, Limitations, and Other Aspects (Unique ID 1663)

The proposed Colorado interChange MMIS is a web-accessed modem healthcare management system that integrates highly optimized business rules engine (BRE) to provide the right rule at the right time.

interChange BPA rules are responsible for most claims adjudication, pricing, editing, and auditing decisions. The configurability built into the BPA rules gives the Department the flexibility and scalability to use the interChange MMIS for pre-adjudication transaction processing for multiple programs across the MMIS enterprise. The BPA Rules Engine defines and processes the following rule types:

- **Provider contract rules**—Services a provider is allowed to perform
- **Client plans rules**—Services a client is eligible to receive
- **Reimbursement rules**—The decisions on appropriate pricing methodology to apply
- **Assignment plan rules**—The services to carve-out of a capitated managed care plan
- **Edit rules**—Most edits that are rule-driven through configuration
- **Audit rules**—Most audits that are rule-driven through configuration
- **Copay rules**—Client responsibility amount
- **TPL rules**—Services are covered by carrier-specific rules allowing cost avoidance and recovery

Reimbursement Rates (Unique ID 1671)

As documented in response to unique IDs 1264 and 1271, the interChange business rules are structured in a modular manner that enables the rules engine to be applied to different services such as client plans, client assignment plans, provider contracts, reimbursement rules and copay rules. Each rule set for these modules is a segregated rule set that can be managed and called as a service itself.

The dynamic reimbursement rule type of the interChange BPA Rules Engine enables authorized users to create pricing rules by a variety of variables such as provider type, specialty, provider contract, geographic location of billing provider, geographic location of performing provider, geographic location of the client, modifier, claim type, encounter, or any combination of these factors. Each rule type is metadata driven, enabling new variables to be quickly added to support processing against any data element held in the MMIS.

Capitation Rates (Unique ID 1672)

Colorado interChange provides the ability to enter, upload, and modify the capitation rates used for specific managed care entities and primary care physicians. Capitation rates are maintained through the managed care business functional area. The rate cells can be updated through the

online windows or through uploading rates from a spreadsheet. Through the mass adjustment capitation panel displayed in the following figure, the user specifies the criteria for the mass adjustment.

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The interChange MMIS will use this criteria to perform the mass adjustment of the capitation payments.

Rates and Payment Types for Managed Care Entities (Unique ID 1673)

Through the interChange MMIS solution, HP is successfully managing MCO enrollment and payments in several states. Within the solution, we support the capability to maintain capitation rates with effective dates for each provider, client, and program. The rates are segmented in the relational database and therefore are not overridden by updates. We base the rates for the clients on the demographic profile of the client such as age and gender. The flexibility of the system also allows for rate overrides.

For example, we can use the rate in the capitation rate cells or use the one for the specific provider in the override table. Sound and proven system design allows for accurate payments based on known information at the time of the capitation runs. HP will use the Department-defined factors for calculating per-member per-month (PMPM) payments made to each entity. We base the payment on the following:

- Age
- Sex
- Category of eligibility
- Health status
- Geographic location
- Number of eligible days in the month

We use the current client eligibility data within the managed care subsystem processes to calculate the monthly capitation payments. We exclude terminated, disenrolled, and deceased clients from the monthly capitation payment to the MCO. Periodic reconciliation of client files is conducted. We also balance these against the MCO and PCP tables. If retroactive changes occur to a client's eligibility, interChange picks up and adjusts the reported data to the previous capitation payments made for the client. Additionally, if a client changes plans, we generate a reconciliation and transfer of the capitation along with the changes. A history of the capitation rates can be viewed through the online audit trails.

Rate Combinations for Managed Care Entities (Unique ID 1674)

Colorado interChange provides robust capitation functions, including the flexibility to pay capitation, premium, case management fees, or medical home payments, and fully supports PMPM rate structures. The features also allow capitation payments to be made using the appropriate rate for the time being paid. The system prorates capitation payments to the days the client is enrolled with the managed care provider in the given payment period, or the system pays a flat monthly rate based on the payment requirement for the particular managed care program.

Colorado interChange will make capitation payments to MCOs and other providers on a schedule defined by the Department. The system enables users to set capitation payments at provider-specific rates based on client demographics, including eligibility program, place of residence, age, gender, and risk factors. Colorado interChange stores the capitated rates for the respective managed care programs in an easily maintainable and user-friendly browser environment. The system has standard capitation rates that can be overridden by provider-specific rates.

FFS Health Benefit Plan Encounters (Unique ID 1675)

The robust claims engine within interChange can parse information based on State-defined rules. In the states where we run interChange for a Medicaid Managed Care program, the rules, edits, and audits provide accurate and timely payment to the MCOs and providers. Colorado interChange can pay capitated services and fee-for-service (FFS) on the same clients in the same month based on rules and client eligibility files.

The interChange claims engine can identify capitated services, allowing FFS claims to be denied if directly submitted by the provider or MCO. This helps the Department avoid costly overpayment and recoupment on those capitated services. Also driven by the rules in the claims engine, interChange can process services carved out of the managed care program as FFS claims.

Colorado interChange can identify effective dates of enrollment, allowing providers to be paid for pre-enrollment services and for other periods of transition when the client is not covered through capitation. Emergency services also can be set to bypass the capitation edits, allowing the client to get needed service immediately.

Multiple Risk Criteria (Unique ID 1676)

Colorado interChange provides the ability for the system to generate capitations based on multiple risk criteria. As illustrated in the following figure, the capitation rate cells can vary based on the client's benefit plan, age, gender, type of plan, and managed care service area.

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The managed care service area is configured through the managed care area or area cross-reference table. The service area can include a single ZIP code or county or a logical grouping of ZIP codes and counties.

Mass Updates to Reference Files (Unique ID 1678)

A healthcare management system that can respond quickly and efficiently to change is essential when states make changes to code sets, such as annual, quarterly, weekly, or State-defined frequency updates. These code sets can include procedure codes, diagnosis codes, or drug files obtained from external sources. Before the effective date of the code set change, the interChange MMIS uses batch processes to load code set data after capturing the code set data from the authorized code source. Each batch job generates output reports that list appropriate counts such as the number of adds, deletes, and changes.

The interChange Reference File Workflow for code sets shown in the following figure will provide orchestration of business activities standardizing best practice business rules for defining the covered services and administration under various benefit plans maintained in the interChange MMIS.

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We will load recommended coverage criteria and benefit package criteria to the policy test environment for Department review and approval. Department staff members can review the recommended changes, make modifications to the recommended changes, and approve or disapprove the recommendations through the user interface. When approved, the modifications move to the production environment with a unique version number as part of the change management process. An audit trail of changes to the code set files is maintained, including who made the change, the date, and time of the change.

Manual Update of Reference Files (Unique ID 1679)

The interChange MMIS uses role-based security to control access and provide the ability for users to manually update the database and supporting reference tables. Users will be granted the appropriate access based on their role to view and update reference files.

Health Benefit Plan Code Sets (Unique ID 1684)

Various combinations of individual, ranges of codes, and combinations of codes can be grouped together to form certain conditions. The following figure shows an HCPCS procedure group that includes individual codes and ranges of codes.

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The Colorado interChange provides the capability to group codes for a wide range of codes such as client benefit plan, diagnosis, diagnosis-related groups (DRG), modifier, occurrence code, provider contract, provider type, provider specialty, revenue code, and type of bill.

Add or Remove Modifiers (Unique ID 1685)

The interChange MMIS uses role-based security to control access to the database and supporting tables. Users will be granted the appropriate access based on their role to add or remove modifiers, on any procedure, or procedure code modifier relationships. Besides the capability to add modifiers to the supporting tables, users can add modifiers or combination of modifiers as a

variable to the BPA rules such as client plan, provider contract, and reimbursement rules. This feature provides the ability to vary coverage and pricing by the use of specific combinations of modifiers.

Rate and Pricing Methodology (Unique ID 1712)

Colorado interChange manages encounter claims in the same way as FFS claims, applying edits, audits, and logic. The MMIS adjudicates or rejects encounters received from MCOs based on State-defined rules. By receiving, processing, and storing encounter data, the MMIS makes it ready for use by the Department to measure performance and track usage.

Colorado interChange can collect and store encounter data at any interval deemed appropriate between the Department and the MCOs. Whether the MCO submits data in a monthly upload or by individual claim at the time of service, the MCO can submit transactions through the web or as file uploads. Electronic encounter submissions are HIPAA-compliant through the X12N 837. Colorado interChange can process the transaction, apply the correct edits and audits, and adjudicate or deny it listing the corrections needed. Colorado interChange can perform pricing to determine Encounter Cost Value based on Department-established rules. We also can adjust the encounter claims if needed.

Authorized users will have access and the ability to define and edit different rates and pricing methodologies within the BRE for encounters separately from FFS claims as indicated in the following figure.

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If users want the pricing to apply only to encounter claims, they simply set the encounter indicator to "Yes." Additionally, the pricing methodology can vary by multiple variables including geographic location of the provider or client, client age, client plan, diagnosis codes, place of service, and provider contract.

Encounter Pricing (Unique ID 1713)

The flexible reimbursement rule feature enables authorized users to define pricing rules based on provider ID fields in a standard HIPAA transaction.

MCO Auto-Enrolling (Unique ID 1716)

Enrollment processing encompasses multiple functions. In Colorado, the Department will define how each benefit plan or MCO may differ in the enrollment methods employed. The enrollment method used may depend on one or several of the following items or other criteria. The information is viewable online through interChange screens:

- Eligibility classification (medical status code)
- Demographic location—client or service area of MCO plan
- Availability of the MCO to accept additional enrollments
- Previous placement in an MCO
- Other household clients' current or previous placement

- Exemption codes (to prevent enrollment)
- Age or gender of the client
- Day-specific or monthly enrollment—prospectively or retroactively

The Colorado interChange MMIS calculates capitation payments based on current or retroactive enrollment dates. The auto-assignment function of the interChange MMIS interfaces with the benefit plan tables to obtain the client- and MCO plan–specific information before making an assignment decision. Auto-assignment occurs only if the client identified as qualifying for mandatory enrollment does not make a choice within the defined time and interChange bases auto-enrollment on other MCO plan unique criteria as defined by the Department such as priority or hierarchy of the plans.

Auto-Enroll Mechanism (Unique ID 1717)

The auto-assignment function of Colorado interChange uses the Department-defined criteria to make an assignment decision, including distribution of clients across MCOs or Health Benefit Plans.

Adding Clients in the Same MCO and Health Benefit Plan (Unique ID 1719)

The ability to auto-assign clients based on clients of the same household is a feature of the interChange MMIS auto-assignment process as defined in our response to Unique ID 1716.

Auto-Assigning a Child (Unique ID 1720)

The ability to auto-assign a child based on the parent's or caretaker's assignment is a feature of the Colorado interChange auto-assignment process.

System Hierarchy Creation (Unique ID 1721)

The auto-assignment process in Colorado interChange will be configured to meet Department policy including a hierarchy to prioritize managed care enrollment and auto-disenrollment from lower priority programs.

Service Plan Spending Limits (Unique ID 1740)

The interChange MMIS supports the ability to set Service Plan Spending Limits (SPSL) using prior authorization (PA). The PA can include multiple line items and each line item authorizes a particular service with its own unit, dollar, or combination limitation. Authorized users can amend a PA record and change spending limits or caps.

Health Benefit Plan Service Limits (Unique ID 1817)

Colorado interChange will allow authorized users to identify and limit services within a Benefit Health plan and by a specific client using the PA features. The PA function enables users to approve a specific set of services for a specific client for a specific time period taking into account utilization criteria set by the department.

Payment Suspensions for Specific Services (Unique ID 1827)

The flexible interChange BPA rules enable authorized users to configure coverage rules for specific services that would only allow payment if the client is not an inpatient of a hospital, nursing facility, or ICF/ID or the client is not enrolled in PACE.

Provider Referral Conflict of Interest (Unique ID 1852)

Authorized users can configure the coverage rules for providers through the Colorado interChange BPA rules engine. HP will work with the Department to define the provider referral conflict of interest criteria for configuration.

7.13 – Rules Engine Requirements	In Production? YES/NO
Description Addresses Requirements (Provide the range as applicable): 1265, 1266, 1277, 1278, 1279	**NO**

System Rules for Business Functions (Unique ID 1265)

The proposed Colorado interChange puts into practice CMS' Modularity Standard, from the Seven Standards and Conditions, by separating business rules from the system core programming. This capability puts the power of creating business rules into the hands of the Department and HP staff members who best understand the Colorado program—the program experts and business analysts.

To put an often-complex legislative requirement into practice, it takes a business-savvy staff member, or a team of these knowledgeable staff members, to incorporate the new legislation into the existing state program nuances and distinctive characteristics. Putting the "clay" into the hands of the business analysts allows them to "mold" and implement the system business rule to carry out the state or federal regulation, incorporating the requirements with the unique aspects of the Colorado healthcare program.

This approach enables authorized system users to create and maintain rules for various business functions including provider enrollment, managed care plan enrollment, managed care client enrollment, client service plan design, health benefit plan design and administration, reimbursement rules, claims or encounter processing, program integrity validation, and reference data update functions.

By understanding the thought process and actual business steps of these various program functions, the Department and HP staff members can turn rules on paper into Colorado interChange business rules that affect client and provider enrollment, transaction processing, and post-payment validation.

Rules Configuration and Rules Engine Design (Unique ID 1266)

The rules in the BRE will be created by authorized users according to the business process requirements. If necessary, a workflow process will allow for rule review and approval by the Department before being configured in the BRE.

interChange Rules, Business Process, and BAM Management (Unique ID 1277)

The Colorado interChange MMIS provides the flexibility needed to address changes managed through business rules and business process management. Our solution is a comprehensive approach that maximizes the coverage and efficiency of these process updates. As described in our response to Unique ID 1264, we presented the step-by-step rule management approach that guides a business analyst through stages of business rule management and rule management details.

Built-In Multi-Level Rule Review and Approval Process (Unique ID 1278)

In our earlier response to Unique ID 1264, we outlined our business rule creation process. One of the first tasks for the analyst is validating the specific rule sheet is not already checked out – making sure the work does not interfere with other modification from the beginning. This check-out process prevents inadvertent work to the rule while this modification is in work.

In step 6 of the process, *Review Rule Differences*, the business analyst can view the difference (at least one element is added, changed, or deleted) between the rule sheet being worked and its corresponding active rule sheet. The focus for the quality review is exactly on the rules that require attention. Step 7, *Upload Rule Sheet*, also validates the performed work by documenting errors for the analyst's review before the final upload of the modified rule.

HP puts validation into the process from the first step to the last approval to help identify any conflicts in the rules as development, testing, and implementation are completed.

Workflow and Rules Approval Process (Unique ID 1279)

HP understands that careful management of the rule base is critical for tight control and communication around the defined MMIS program policy. We defined our workflow and rules approval method, part of our proven eight-step process, in our case study illustration under the response to Unique ID 1264 earlier in this section. From the first step to completion and submittal for approval, HP uses a mature, proven process to make sure the workflow and rules meet the documented requirements, from simple modification in transaction processing to complex federal or state regulations impacting client benefits, provider reimbursement, or code set usage.

RESPONSE 38m

7.14 – Workflow Management Requirements	In Production? YES/NO
Description Addresses Requirements (Provide the range as applicable): 1280-1294, 1766, 1868, 1869	NO

When identifying aspects of the interChange MMIS as "In Production," we employed a conservative approach. By that, we mean we have elements of the solution identified as not in production while aspects of those components have been running in production, in multiple states for years.

For example, HP has been integrating workflow for years in multiple states including BPEL workflows for business processes and paperless document management workflows. We also have delivered workflow as part of our Wisconsin MMIS since 2008.

CLICK FOR VIDEO

A video demonstration of the additional scenario Integrated Workflow is included in RESPONSE 47.

The integration of the K2 workflow engine with interChange, which offers the best features of the workflow experiences we have done in the past, is an enhancement to the MMIS and thus labeled as not in production.

The interChange MMIS, as its name implies, is all about change, or continual evolution as MITA envisions it. The proposed core MMIS is a production-proven application that has been certified by the latest CMS checklists. It is that core that is shared for the benefit of Colorado and enhanced through the proposed workflow improvements.

Workflow Management

Making human and automated tasks and workflows repeatable, accurate, and smooth is part of improving the efficiency of any business process. HP's proposed Colorado interChange solution offers extensive improvements to core MMIS capabilities, making it easier to streamline repeatable business processes and allow for accurate reporting of detailed metrics.

Comprising business process management and business rules, the Colorado interChange workflow solution will allow authorized users to manage business processes at the granularity of a particular step in the workflow process or review the statistics of workflows aggregated across months. The workflow solution also will provide consistent quality and productivity, leading to optimal performance.

HP's workflow solution is built on a service-oriented architecture (SOA), which allows for extension of workflow capabilities across business units and to external organizations. The

solution orchestrates staff consistency and efficiency, making training easier and quality management and workflow metrics measurable by providing the following:

- Integrated workflow that standardizes business processes and facilitates consistent quality and productivity

- Integrated security, role management, and control screens that let authorized users adjust workloads, schedule time off, monitor exceptions, and action escalations

- Out-of-the-box reporting and dashboards that provide control and transparency to the entire workflow solution or on single workflow instance basis

- A graphical representation of the current workflow process, displaying possible paths, paths taken, activities begun, and enabling standardized workflows throughout the MMIS workflow solution

Why Workflow Management from HP Is the Best Solution for Colorado

Colorado will benefit from the implementation of HP's workflow management solution:

- Workflow efficiency is demonstrated through detailed online reporting of the process metrics, their individual steps, and the analyst efficiency at each step.

- Healthcare administration is simplified in the following ways:

  - Processes are standardized, raising quality.

  - Efficiency is improved by workflow integration into the Colorado interChange.

  - Analysis and decision-making is supported with detailed metric reporting.

  - Transactions are auditable because they are registered as they occur.

  - Workloads are managed through an integrated security, role management, and control console. Supervisors can adjust workloads, schedule vacations, and monitor exceptions and escalations.

- We achieve greater workflow efficiency through detailed online reporting of the process metrics, individual steps, and analyst efficiency at each step.

- Simplification of healthcare administration occurs because of the following:
  - Standardization of workflow processes raising quality
  - Integration of workflow within the Colorado interChange for high efficiency
  - Detailed metric reporting supporting insightful analysis and decision-making
  - Registration of workflow transactions making them auditable

Workflow Capabilities

Workflow technology will transform almost every facet of daily work with the Colorado interChange. It is one of the key areas of transformation requested within this RFP. Successful workflow is more than just having a piece of software. The workflow technology needs to standardize and enhance the business steps, making it easier to route information, track stages of a process, automatically send correspondence, and track the detailed metrics of each of these steps along the way. We understand the full potential of workflow, and have designed our solution to be holistic and integrated into the interChange User Interface (UI) and the Business Services Framework depicted in the following figure.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE DEPARTMENT AND HAS BEEN REDACTED

The interChange Business Services Framework solution integrates COTS products into the interChange system to create one integrated view that brings high value and efficiency to the user. Standard application workflows will not suffice for the type of transformation Colorado requires and, as such, we have focused on integrating enterprise-capable COTS tools to achieve the goals.

The framework streamlines business processes, provides visibility into detailed metrics, and facilitates consistent quality and productivity to promote optimal performance. Our HP workflow management solution will standardize practices into processes supported by a COTS workflow engine. Workflow will provide visibility into the status and issues of business processes, allowing supervisors to identify, resolve, and prevent bottlenecks to produce higher-quality business outcomes.

Workflow Initiation (Unique IDs 1280, 1282, 1285, 1288, 1290, 1291, 1766, 1868)

(1291) The K2 blackpearl workflow engine and Colorado interChange MMIS portal will support workflow access, configuration and delegation of task assignments, and efficient execution of the business processes developed for the Department. As part of workflow configuration and ongoing process tuning, authorized workflow users can assign weights and priorities to workflow items and indicate whether completion of an item requires HP or the Department's approval. (1285) Weights and priorities will be used to automatically prompt users to work the most critical workflow items from the worklist before less critical items. As tasks are completed, they are removed from the worklist. (1282) A single workflow may have multiple paths, include escalation for issues, and involve multiple users drawing tasks from different worklists. Additionally, the integrated workflow engine manages multiple simultaneous processes as workflow items progress throughout the MMIS.

(1280) A business event—such as receipt of a provider enrollment application—will trigger a call to a web service that will start a new business process workflow. The engine will generate work items and assign them to appropriate workers' worklists tailored to reflect departments, business areas, or even individual task specialization. Security services integrated within the Business Services Framework associate user IDs to groups by their profiles to manage access to data, screens, or applications and worklists. (1288, 1766) Based on the association of user IDs to workflow items, automated alerts are generated to individual users or group user lists when new items or changed items require a specific action from the user.

Workflow automatically assigns tasks and delivers them to individual or group task lists. Notifications are automatically distributed by email to inform users that they have work to be performed. Overdue assignments in the users queue are noted with a red flag. The tasks remain in the worklist until they are completed—they cannot be lost, ignored, or deleted. Each list item represents the next workflow step to be completed. Tasks are assigned to users based on that specific user's group memberships, which can be tailored to reflect departments, business areas, or even individual task specialization. (1287, 1868) Tasks are automatically updated real-time based on user response through the interChange screens or automatic adjudication by the workflow engine. Meta-data regarding elapsed time between steps is dynamically captured at each step and available for business activity reporting and trending. Each of these interactions continues until the task has reached the end of the process and is considered "complete" as defined by workflow.

The following figure captures the worklist filled with tasks to be completed. The worklist is customizable, allowing the user to sort by fields or group tasks to quickly find the work item needed. In the figure, the analyst has grouped the worklist items by the carrier ID to better facilitate a call to that company and through one call take care of the set of follow-up items specifically for that carrier. By being able to dynamically change the organization of the worklist data, users can configure the list to optimize their work efforts.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE DEPARTMENT AND HAS BEEN REDACTED

The next image shows the different options located in the worklist tool bar after the task has been opened. The user can continue with the process, view a navigational chart of the current business process, or pass the task along to another user.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE
DEPARTMENT AND HAS BEEN REDACTED

At the top of this window is a bar with a menu of actions that the investigator can select while working through this process. The workflow engine dynamically presents the available actions appropriate for the current workflow step. The system guides users through the process so they apply consistent business processes in their work. Additionally, HP's business process solution accelerates new user training because the system restricts choices to the logical next steps and provides a graphical road map of the process in the ViewFlow screen.

TECHNOLOGY HIGHLIGHT Some fields will have a special icon next to them. These buttons provide instant access to the data necessary for the analyst to perform their tasks. The quick access feature will increase the efficiency and accuracy of Colorado interChange users. The preceding figure depicts the additional tabs included with the workflow form. The Notes and Attachments tab keep a log of information that will stay with the worklist item through the entire process. Notes and attachments are stored and assessable online and can be configured to HP workers and Department workers. (1290) Files from productivity applications can be included as attachments during the process so that they are available to task assignees as part of their workflow duties. If desired, we can create additional tabbed windows that can display information such as instructions to the claims adjuster.

After a task has been completed, the item is removed from the worklist and passed on to the next user to complete the following step of the business process, supporting current, real-time information. The workflow process also can initiate the creation of letters to clients or providers. The request is initiated within the workflow process, and a service call initiates the HP Exstream letter-generation process. The interaction between workflow and letter generation is handled automatically as the analyst simply clicks a button.

ViewFlow (Unique IDs 1281, 1287, 1291)

TECHNOLOGY HIGHLIGHT

(1291) The Colorado interChange MMIS workflow solution transforms workflow from an abstract concept to a user-centric, high-business–value capability. ViewFlow mode provides the "big picture," showing paths taken, highlighting the current location, and displaying options available at any point in the process. The interChange workflow engine provides support for priorities, security alerts, and the multi-routing of tasks. The routing of task configuration includes the ability for escalation to multiple layers of management as defined by local business rules. (1287) The K2 ViewFlow is dynamically updated in real time as workflow activities are completed, including human tasks. The relevant data and metrics are captured and available for reporting.

(1281) As the following figure shows, ViewFlow is available for in-process and historical workflows, allowing reviewers to determine exactly what path a given instance of a process followed, even months later. Processing data is retained for every work instance. The interChange workflow engine documents and stores the results of each process as part of the overall MMIS history database. The storage of this detailed metadata enables the business users to recall processes, see the defined ViewFlow path of activity, and view the detailed metrics of each step of the business workflow, seeing the duration of the process and who performed the work. This data supports research or dispute resolution should the need arise.

K2 ViewFlow

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DEPARTMENT AND HAS BEEN REDACTED

This ViewFlow depiction of the workflow provides an innovative method of providing visual guidance to the business users to see how the business process steps relate to each other. The workflows and their respective view flows can be configured and customized to meet local business policies. This single workflow engine, integrated with the Colorado interChange, is flexible enough to provide comprehensive workflows across the MMIS business areas.

Managers and Authorized Users (Unique IDs 1280, 1283, 1286, 1288, 1291, 1766)

(1280, 1291) By configuring the workflows for the Colorado interChange business functions, we are building into them the unique business rules that are used to define the process. In each of the workflows, we can include a step at the end of the process to make the item available for selection by the QA workflow. Authorized users can determine a specific number or percentage

of instances based on the entire workflow, an individual step, the user who performed the step, or a combination. This process allows us to target our QA efforts to best identify opportunities for process improvement or performance issues.

(1283) Managers and other authorized users also will have access to the tasks assigned to them and their employees. Task assignments and workflow processes will be configurable and managed by web pages in the Colorado interChange. These pages will allow a task assignee to be quickly and easily updated should the need arise. (1766) Using this web page, authorized users can override current task assignments and reassign, delegate, or close at any point in a workflow process where a task is pending or active.

(1286) When reassigned or delegated, the task will no longer appear on the previous task assignee's worklist. Capacity levels for each user can be assigned to case managers at the agency or program level and PAR or program integrity reviewers for related tasks managed by the MMIS workflow. Additionally, timing and escalation parameters for workflow process and individual tasks will be configurable, and the assignees for such escalations. If an issue or error occurs within the workflow or other special circumstance, a configured administrator or other authorized users is notified of the issue or event. If a task has not been put into action by the defined amount of time, it will escalate and assign a task to the configured assignee for disposition.

Reporting (Unique IDs 1281, 1284, 1291)

TECHNOLOGY HIGHLIGHT

(1284, 1291) The workflow also can capture which user completed each step and when it was completed, and it allows management to view time spent on each task and the caseload that each reviewer possesses. This helps verify that tasks are being completed promptly and users are not overwhelmed with their caseload.

At the managerial level, K2 blackpearl provides in-depth reports that give information about staff workload and productivity at an enterprise level. (1281) The workflow engine and services collect and store key information during the workflow process that is then accessible from the dashboard and can graphically present key process indicators (KPIs) and other reports that detail task metrics such as user timeliness and pending work, approval and denial percentages, throughput, and time metrics by task that help identify bottlenecks. Managers can drill down to the individual level to determine productivity measures or compliance to service-level agreements (SLAs). The workflow web services store key performance metrics in the Workflow Business Activity Monitoring (BAM) repository database, allowing heightened insight into business processes.

Managers can select the following five workflow reports:

- Activity statistics
- Process statistics
- Process information

- User performance
- Process overview

One of the most powerful features of our business process solution is the ability to visually analyze workflow information in real time, as the following figures detail. This will enable the Department and HP to adapt business processes in response to data gathered from daily operations.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE DEPARTMENT AND HAS BEEN REDACTED

The preceding figure and following figure depict the process overview report that drills down into a single workflow instance. The report details the statistics such as completion time for each step of the workflow process. The reports display the productivity statistics associated with an individual step in a workflow process or a user. Managers can use this information to determine easily which workflow steps may be a roadblock in business processes and update to increase efficiency.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE
DEPARTMENT AND HAS BEEN REDACTED

Managers also can identify individuals who may need additional training or support to complete certain steps in the workflow. As the following figure depicts, users may drill down into key data and customize reports providing ad hoc information to aid in business process management.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE
DEPARTMENT AND HAS BEEN REDACTED

Workflow Training (Unique ID 1289)

The workflow engine dynamically presents the available actions appropriate for the current business process step. The system guides users through the process so they apply consistent business processes in their work. Additionally, our workflow solution accelerates new user training because the system restricts choices to the logical next steps and provides a graphical road map of the process in the ViewFlow screen.

We will have workflow overview training that level sets the capabilities of workflow, how it interacts with the rest of the MMIS, and other features. A second aspect of workflow training will be an overview of the workflows that are enabled through each business area. This second training is geared specifically for role-based training of who works on what aspects of the program.

Workflows and Processes to be Developed (Unique IDs 1288, 1292-1294)

Our workflow process operates completely online. A business process workflow can be initiated from a webpage directly where certain information is populated and then submitted for workflow. Additionally, HP can enable users to create a workflow instance by a batch process according to an optical character recognition (OCR) scan, such as in the cash receipts and check processing workflow. After the workflow has been initiated, work items will be created according to the design of the workflow and outcomes of previous tasks or, as in the case of provider enrollment, according to the list returned from the rules engine denoting which tasks are required for successful provider enrollment.

(1294) We will create a business process workflow that will allow the submission of grievances and appeal requests. When submitted through the portal, these requests will initiate a process that will route to the configured list of authorized system users designated for approval, according to the specified business rules. The workflow features apply to include delegations, escalations, and configurable timing and task assignment parameters.

(1292) A business process workflow will be developed that will allow authorized system users to submit requests to update system profiles. The workflow will contain a list of approval tasks that will be routed to the designated approvers (user or groups), as the Department defines.

(1293) The EDMS will support K2, the MMIS workflow processes, and serve as an attachment repository for incoming workflow attachments after workflows have been completed. In the example of provider enrollment, after the workflow instance is completed and an approval or denial has been made, a call is made to the EDMS to store the applicable attachments for that workflow instance for archival purposes.

SharePoint (Unique ID 1869)

Through SharePoint, users can create customizable team workspaces, coordinate calendars, organize documents, and receive important notifications and updates through communication features including announcements and alerts. SharePoint also supplies workspaces with

document storage and retrieval features, including version history and custom metadata. New features in Microsoft SharePoint Foundation include enhanced recycle bin functions for easier recovery of content and improved backup and restoration.

Users can collaborate on creating and editing documents. With enhanced document management capabilities, including the option to activate required document checkout before editing, the ability to view revisions to documents and restore to previous versions, and the control to set document and item-level security, Microsoft SharePoint can help validate the integrity of documents stored on team sites.

IT departments can now set permissions as deep down as the document or item level. Site managers, teams and other work groups can initiate self-service collaborative workspaces and tasks within these preset parameters. New features enable IT to set top-down policies for better content recovery and users, groups, and team work space site administration.

RESPONSE 38n

7.15 – Data Management Requirements	In Production? YES/NO
Description Addresses Requirements (Provide the range as applicable): 1154, 1295-1315	YES

HP is one of the world's largest technology companies with more than 75 years of technology innovation and almost five decades of experience managing large systems. Data security and integrity has always been the cornerstone of our healthcare management solution. HP is aware of the critical data management role of the Colorado interChange. HP will work with the Department to implement policies and procedures in accordance with HIPAA and HITECH security standards and industry best practices.

HP's experience and industry expertise will enable the Department to accomplish the following:

- Provide the appropriate system access to users and system partners. This will be achieved by implementing the Colorado interChange Medicaid Enterprise system Security solution. This software will allow the Department to provide secure access to web-based applications. This component of our solution also will reduce the burden of access management by providing the Department and its business partners with the ability to share a common identity and access management system.

- Provide industry leading logging and system monitoring through the HP ArcSight and our Standard Reference Architecture. This will provide litigation quality chain of custody with digital signatures and timestamps. ArcSight will encrypt logging messages within the system using FIPS 140-2 encryption in adherence with federal and HIPAA security standards.

- Provide a managed, integrated, security service designed to address security threats specifically targeting desktops, laptops, and servers. This will be accomplished through HP End Point Threat Management service. This service includes a 24 x 7 monitoring of endpoints from a central console.

- Provide the Department and its business partners secure, timely, and accurate data interfaces using the Colorado interChange solution. We will use our extensive Medicaid experience to work with the Department's business partners to implement reliable interfaces to securely send and receive information from the MMIS.

- Provide testing support to the Department and its business partners to establish testing and verification procedures when implementing interfaces. These processes will provide the consistency and quality control essential to operating a successful MMIS ecosystem.

- Provide a storage capability that will retain interface files for at least 60 days and archives for six months. We will take advantage of our experience and best practices to develop a storage plan where data is kept for the required life cycle.

HP understands that for the Department's MMIS to be successful, it is critical that the system provide reliable interfaces to a significant number of entities, such as the CBMS, COFRS, BIDM, and PBM. This information must be limited to the authorized party; it must also be secure, accurate, and timely. Our healthcare experience gives us the understanding that there must be quality mechanisms in place to verify the quality and integrity of the data being exchanged.

Coordinate with other Contractors (Unique ID 1154)

HP will work directly with the Department and its contractors to establish a mutually acceptable schedule for batch processing. The Colorado interChange solution will use CA AutoSys to automate the scheduling of batch processing jobs. HP also will coordinate with each business partner and agency to develop best practices to verify each interface file is validated, required data is present, and the data is received. For HIPAA-mandated transactions, our translator will verify that the transactions meet HIPAA standards for format and content.

TECHNOLOGY HIGHLIGHT

HP's solution will include interChange Connections, which is a flexible message-oriented framework for implementing system interfaces. Part of this offering is a File/Message Tracking Service (FTS). This service will track, monitor, move, and log files through the Colorado interChange solution. FTS provides a complete audit trail of each file and provides real time updates as its status changes. The File Tracking Web interface displays detailed error notifications allowing quick response to failed transactions. Sharing our experience and lessons learned operating Medicaid systems in 20 states, HP will cooperate with each interface partner to develop a communication plan to resolve problems quickly.

Support Federal Regulation (Unique ID 1295)

HP is the best qualified organization to work with the Department to accomplish its goals during this time of tremendous change in regulations. The interChange system currently meets HIPAA, HITECH, and ARA security and privacy requirements. We have been proactively evolving the interChange MMIS business functions by incorporating MITA and the Seven Standards and Conditions (7SCs) guidelines. HP is committed to support the MITA Maturity Model, as it provides direction related to the federal legislation in support of the American Recovery and Reinvestment Act (ARRA), Health Information Technology for Economic and Clinical Health Act (HITECH), and the Affordable Care Act (ACA).

We look forward to working with the Department to meet the evolving CMS initiatives such as the CMS 7SCs, MITA, ARRA, HITECH, ACA, and other health mandates. For example, HP has experienced staff members who are committed to work with the Department to enhance business process maturity in functional areas such as provider enrollment, enhanced communication, and advanced data access and reporting.

HP will provide industry leading logging and system monitoring through the HP ArcSight and our interChange Connections technology framework. This will provide litigation quality chain of custody with digital signatures and timestamps. ArcSight will encrypt the logging messages within the system using FIPS 140-2 encryption that meets federal and HIPAA security standards. Our interChange File/Transfer Service will verify files can be securely sent and received. HP will work with the Department and its interface partners to develop any validation or editing required for each interface. HIPAA required transactions will go through compliance checking to validate the transaction is complete in format and content. Since each regular interface will be scheduled, any missing interface files will be found quickly and users notified.

The Colorado interChange system can accept digital signatures during the enrollment process. This signature is required by the individual provider or the office manager of larger groups to accept the terms and conditions of the agreement and confirm that information is valid. The use of digital signature dramatically improves the provider enrollment process.

MMIS Data Management (Unique ID 1296)

- HP ArcSight will verify event integrity, confidentiality, and availably with your Colorado interChange solution. This offering will provide a litigation quality chain of custody with digital signatures and timestamps with each event. ArcSight log messages are encrypted and can be installed in an agent-less or agent-based configuration with software and hardware form factors. One of the high points of the software design enables logging to continue in cache, even if connectivity with the ArcSight logger is unavailable. HP ArcSight supports the ability to make sure continuous data access for the client account by emailing analysts to recognize and respond to security alerts related to nonreporting devices. HP ArcSight messages are sent using FIPS 140-2 encryption to protect the data in transit throughout the HP ArcSight infrastructure

- The Colorado interChange Security system component will provide single log on (SSO) access to Department users. This approach will allow the Department to provide secure web-based applications to authorized users. This component also will reduce the burden of access management by providing the capability for the agency and its business partners to share identity and access management.

- The Colorado interChange Connections will provide a File/Messaging Service that monitors, tracks, and moves files throughout the Colorado interChange solution. FTS provides a complete audit trail for each file and provides updates in real time through a web interface.

The underlying process uses Secure File Transfer Protocol (SFTP), and will include AES 128 or higher encryption. The HP standard for encryption is FIPS 140-2 certification for encryption devices. The HP policy is to encrypt traffic in transit where possible, using AES 128 or higher algorithm.

- Network security: HP design practices involve the use of encryption for traffic crossing WAN links and traffic is run through HP TippingPoint IPS devices and Cisco ASA or Juniper firewalls. Network equipment used is FIPS 140-2 and CCS compliant. By default, the firewalls are configured to deny traffic; the only traffic allowed to pass is that which is specifically allowed. Unused network ports on the network equipment are administratively shut down/disabled.

- Security Administrators verify the availability and authenticity of data with support along four functional areas:

  - Security Design – evaluate security requirements and products, design rules for privileged access
  - Security Monitoring – monitor vital files, review logs and compliance
  - Security Management – protect PKI keys, provide user account management
  - Security Incident Response – report, investigate, and address security incidents

- Account Security Officers use the Account Security Governance and Compliance Management (ASGCM) tool. The ASGCM tool was developed and maintained by a core group of security and privacy professionals. The ASGCM tool provides a common and standard approach to risk management, account security governance, and compliance monitoring. The ASGCM gives HP security and privacy officers a solid platform to verify the integrity, confidentiality, and availability to sensitive information.

The Colorado interChange framework delog will include audit trails to keep track of the data modified by a given user or process. Online audit trail information will be available through auditing panels which are linked from each panel in the Colorado interChange user interface.

We also will implement HP End Point Threat Management, which is an integrated security service designed to validate the security of desktops, laptops, and servers. This service includes 24 x 7 monitoring of server endpoints from a central console. Our EDI translator will be used to validate the HIPAA transaction to make sure that it conforms to the HIPAA standard with valid structure and content.

Reliable Data Exchange (Unique ID 1297)

HP will implement the Colorado interChange Connections solution to provide a robust data exchange capability for the Department's MMIS. Colorado's interChange Connections will feature a flexible message-oriented, middleware framework supporting our SOA approach. Colorado's interChange Connections will provide an FTS that will be used to monitor,

track, log, and move files between external systems and internal components. FTS includes detailed error notifications, which allow for quick response to data exchange problems.

Our proven, CMS-certified interChange data model design will meet the business process needs of both the Department and MITA. The design of our data model is separated into discrete MITA business areas such as provider, member, claims, reference, TPL, EPSDT and allows our teams to take a modular approach to the management of the data within the system.

With a unique ID for each party involved in the file transfer process, the parties involved cannot deny their participation in a transaction. ArcSight will create a litigation-quality chain of custody with digital signatures and timestamps when the file or transaction passes through each component of the MMIS ecosystem.

Provide Data Changes and Consistent Provider Naming Standards (Unique IDs 1298, 1299)

(1298) interChange is a highly configurable system, allowing for business users to make changes to processing rules and code tables using the user interface, without requiring the assistance of a developer. When analysis determines that a change affects the database structure, the change will be submitted and approved through the data model review board and implemented through the systems development life cycle (SDLC).

(1299) interChange has a mature database model with has been continuously refined through 13 Medicaid implementations. The database design delineates between data elements by function and avoids the high degree of data normalization that can make data models hard to maintain and understand. As specified in the requirement, the Provider function differentiates between first names, last names, and business or corporate names. HP will work with the Department to review the current search capability, and if changes are necessary, will work to find a balance of search flexibility and performance of the system for provider data searches.

Establish Master Source (Unique ID 1300)

HP will work to establish the Colorado interChange system as the primary record source for the over-arching COMMIT project, working with the Department, PBM, BIDM and other vendors to establish robust data governance and data model change communication processes.

Provide Data Source information (Unique ID 1301)

The Colorado interChange system will provide a comprehensive online audit trail function that allows a user to determine the 'who, what and when' of data updates to the MMIS. This audit trail tracks the user id, in the case of online activity, or the batch user ID that modified the data and the date of the modification. Auditing is a critical requirement of CMS certification, and the base interChange system has been CMS-certified in 12 states, including four states using the new MECT checklist.

Colorado's interChange online audit function will meet the requirement of being able to track changes to the system and assist with the identification of source data used with the system. Below is an example of the audit trail panels tracking to updates diagnosis code 4019.

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Provide Access to Process and System Documentation (Unique IDs 1302, 1303, 1311)

(1303) HP's innovative @neTouch online help feature provides context sensitive linking to the MITA business process steps directly from the interChange user interface. HP will change the @neTouch capabilities for Colorado to link to the MMIS data dictionary, to supplement the current online help capability and meet this requirement.

For more details on our @neTouch family of features, see RESPONSE 38j.

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DEPARTMENT AND HAS BEEN REDACTED

(1311) HP will use a combination of HP Project and Portfolio Management (HP PPM) and HP Application Life cycle Management (HP ALM), and Microsoft SharePoint to support the Department's MMIS and provide a comprehensive view into structured data, whether it is project related or MMIS data.

HP PPM will serve as the overall project tracking and reporting tool. HP ALM will be used for requirement management, and testing management. SharePoint will be integrated with HP PPM and HP ALM, to serve as the document repository. The tool enables HP to create and access secure content while automating records management. It provides versioning and streamlines content management. We use these sites for "living" documents—types of documents that typically require updating and versioning. This integrated collection of collaborative tools provides a complete set of documentation capabilities throughout the project life cycle.

(1302) HP PPM, HP ALM (which have been repeatedly rated in the top tier of enterprise commercial off-the-shelf (COTS) products by Gartner and Forrester), combined with SharePoint, will allow authorized users to view and manage:

- Project Reporting

- Risk Management

- Issue Management

- Schedule Analysis

- Requirements Management

- Testing Management

- Test Case and Test Results Documentation

- System Object Documentation (which would include data dictionary information and documentation of structured data

- System Object Management

- Business Process Documentation

- Developer Work Patterns

HP's Process and System Documentation Tools

HP PPM
Overall Exec PM Reporting
Risk Management
Issue Management
Schedule Analysis

ALM
Requirements Management
Testing Management
Test Case Documentation
Test Result Documentation

SharePoint
System Object Documentation
System Object Management
Business Process Flow Relationship Mgmt
Developer Works Patterns

348_072_01_0313
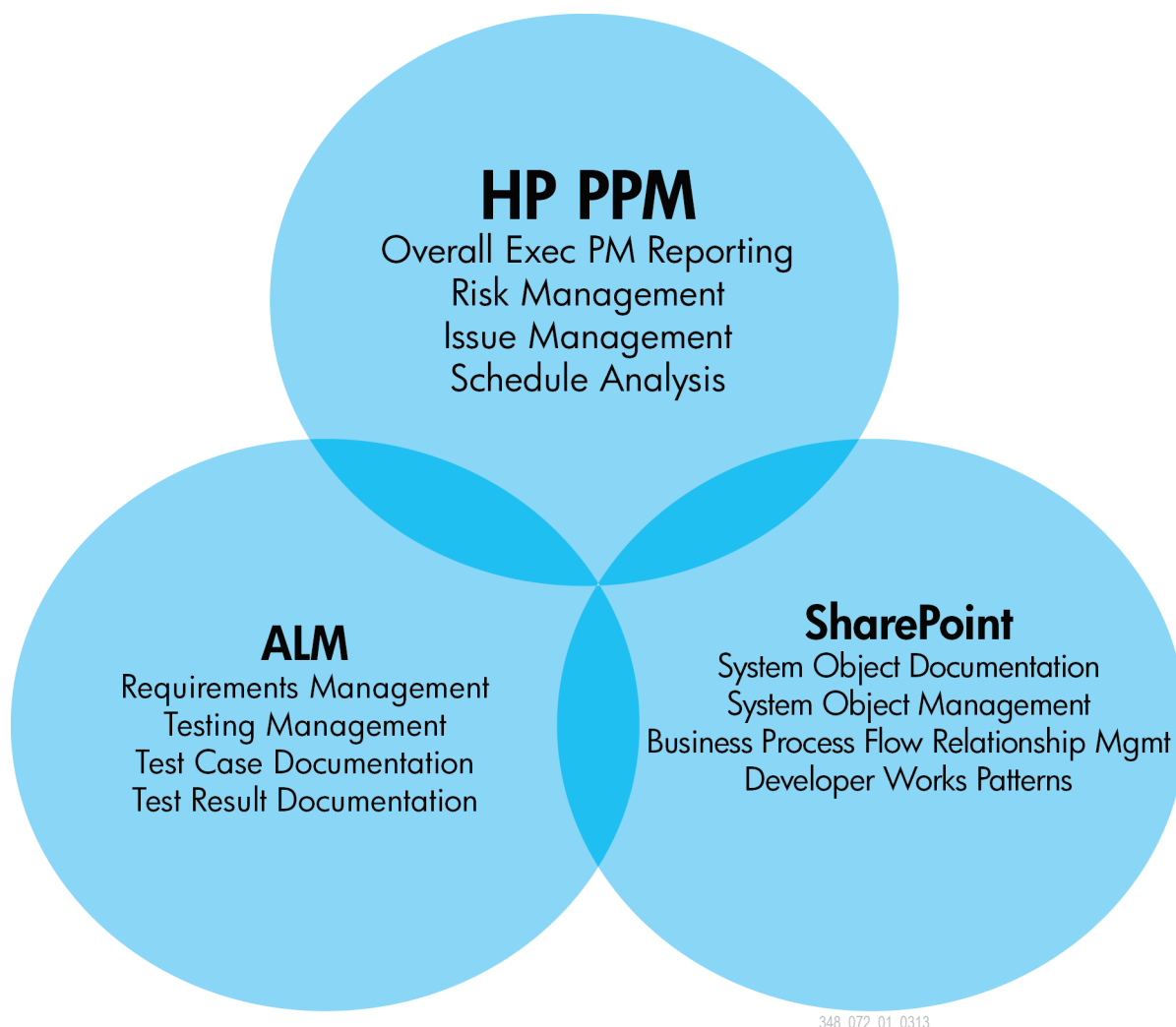
Provide Data Conversion (Unique IDs 1304, 1305)

HP details our conversion approach, which meets both requirements, in RESPONSE 29e.

Provide Data Storage and Backup (Unique ID 1306)

The interChange batch framework creates a generation data set for each interface file. This generation capability has configurable parameters that determine how many generations to keep in the file system and how many of these should be retained in a compressed archived format. These interface files will be configured to keep the files for 60 calendar days, with a maintenance period of 6 months. HP will work with the Department to define each individual interface retention requirement in the Requirements Verification Phase.

Provide Authorized Users Configuration Access (Unique ID 1307)

The interChange system is highly configurable and provides many options in each functional area for the user to add or update valid values. The functional area with the most configurable attributes is the Reference subsystem, which provides much of the support data used through the interChange system. For example, a user can configure a client benefit plan and provider contracts through user panels. The data entry of this information allows the user to add rules to define policy without the need for developer customization. These capabilities will give the Department the ability to make changes to policy more quickly and more accurately than in the legacy system.

We include an example of the Benefit Administration Panel in the following figure. This panel is used to define the services and restrictions that control whether a service is covered. This panel has many options available to the Department to make changes to meet the business policy. The panel allows the effective and end dates, Recipient Age, Medical Review, Prior Authorization, Medicare Coverage, Drug Class, NDC Coverage, Family Planning, Place Of Service, Claim Type, DRG and Procedure, Provider Type and Specialty, Modifier, Condition Code, and Billing Provider Group Editing.

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Effective Date for Eligibility for Clients and Providers (Unique IDs 1308-1310)

(1309, 1310) The interChange system's client eligibility and plan enrollment information is date-segmented to support claims processing by date of service. In the case of managed care enrollment, the client information panel will show the beginning and end enrollment dates for the MCO.

The following two figures show the eligibility and the managed care enrollment information for a client.

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(1308) The eligibility of the client is correlated with incoming claims using the from date of
service on the claim. The following figure provides a screen shot showing the Claim Health

Program panel that displays the program the claim adjudicated under, and other information, which includes attributes that impacted payment such as the rate type and pricing indicator.

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The interChange user interface also provides panels to display details of the MCO capitation payments and status. Role-based security allows an authorized user to view capitation payments and any recoupment that has occurred, as seen in the following figure, which provides a screenshot of the client payments and recoupments. Should the MCOs require access to view this information online, HP will work to establish read-only access to the Department's MMIS to provide this capability. The MCO will also be notified of changes to a client's enrollment through the HIPAA-compliant 834 transaction. The MCO also will be notified of any capitation payments or recoupments through the HIPAA 820 transaction.

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Provide Contact Information (Unique ID 1312)

HP will work with the Department to define and develop a directory of contact information for clients, providers, vendors, Department employees, and contractor employees. The Colorado interChange user interface will be enhanced to allow an authorized user to submit an online request and be provided a comma-separated (CSV) file to import into desktop mail merge applications. HP plans to change interChange to conform to the requirements of the Department's ACP program and will verify this enhancement retains integrity of the address confidentiality changes.

Ability to Report on Client Address (Unique ID 1314)

HP will work with the Department to develop claim and encounter editing against the client's address when it is provided on the claim. Edits will be set during claims processing flag address discrepancies between the claim and the address of record. HP will work with the Department to define and implement a report showing claims with address discrepancies and distribute to the required stakeholders.

Role-Based Authorization (Unique ID 1315)

HP will implement the Colorado interChange Security solution, which provides secure, role-based authentication and single logon capabilities. interChange implements role-based security at the field level, allowing the configuration of read-only, update and invisible permissions for a given field and role combination. Role-based security permissions also can be inherited, providing a role full access to a business area such as provider using a single security rule at the provider subsystem level, if desired.

7.15 – Data Management Requirements	In Production? YES/NO
Description Addresses Requirements (Provide the range as applicable): 1313	**NO**

Upload of Biometric Data (Unique ID 1313)

Please see RESPONSE 49 for detail on this optional requirement.

RESPONSE 38o

7.16 – Application Environment Requirements	In Production? YES/NO
Description Addresses Requirements (Provide the range as applicable): 1316-1318	YES

Application Environments Approach

Establishing the application environments that support the architecture and business needs during development and operations is critical to the success of an MMIS project. Our teams have found that the delineation of environments and the activities that are performed in each environment leads to greater project management control, easier testing coordination, and overall higher-quality results.

Application Environment Concurrency (Unique ID 1316)

The separation of environments allows for applications to be run simultaneously in each, without effect on one another. Additionally, the Colorado interChange web user interface (UI) will enable Department analysts to work in multiple sessions simultaneously. This increases efficiency, allowing analysts to have multiple records or screens open at one time, without having to close the previous. This functional capacity is enhanced with @neTouch Access.

The @neTouch Access feature—shown in the following figure—provides dynamic, context-sensitive, single-click navigation to the most relevant panels based on the current business process being worked.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE
DEPARTMENT AND HAS BEEN REDACTED

As shown in the previous figure, @neTouch Access will enable Department Analysts to click on the @ icon next to a field and bring up a new browser window with the most commonly required page and tabs related to that field and the new screens are already populated with the detailed data related to the original screen. For example, in the example above the Department analyst is on the claims screen and clicks on the @neTouch hyper-button next to the Provider ID field. Instantly, the analyst is presented with the Provider Information related to the original claim screen. Analysts can easily toggle between the different browser windows or place them side by side on the display to view simultaneously. interChange not only allows for a user to have multiple screens open, but makes the navigation available through @neTouch, making navigation easier and fast.

Application Environment Implementation (Unique IDs 1317, 1318)

The following figure presents the comprehensive view of the proposed environments and their relative relationships within the Colorado MMIS solution. The figure details several solution highlights.

(1318) Our solution provides a comprehensive approach to environment management. HP was an industry pioneer in the use of a configuration environment. This environment provides a central location for configuration values and business rules, allowing them to be maintained and locked down for quality purposes. This best practice is based on lessons learned from our 13 successful interChange implementations.

The organization of the environments follows a quality control change management promotion path, providing orderly releases to the MMIS—illustrated by the green environments on the figure. Release management encompasses the following types of changes, allowing each to move from environment to environment:

- Application changes
- Workflow changes
- Data changes
- Benefit plan additions
- Data model changes
- Security role changes
- Rules engine changes
- Configuration data
- Infrastructure updates

The release management process tightly controls the changes moved into each environment. It coordinates the activities of stakeholders and provides communication to confirm awareness of which changes are being released into each of the separate environments.

The ability to move these types of changes between environments through the change management path allows for quality assurance at each step, while significantly lowering the risk of Production issues.

Finally, the figure documents two support environments which complement the other environments and the activities required to support the diversity of project activities.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE
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(1317) The following topics define the activities that each environment supports:

- **Data Migration**—A dedicated implementation environment used by the Conversion team to map the source MMIS data to the interChange MMIS repository and to validate the business rules applied to the data during conversion. This environment is specific to the implementation phase of the project and will be removed after moving to operations.

- **Configuration**—A single-purpose environment stores the official benefit plan administration and other configuration code values of the Core MMIS solution. This environment allows the configuration and validation of benefit changes outside the production environment, giving greater control to managing new or changed benefit policies.

- **Development and Integration Test**—This environment is used by developers to experiment, develop, and unit test solutions. It also is used to initiate the integration of the separate MMIS components from developers. This environment provides the opportunity to test module changes as they relate to the MMIS application as a whole.

- **System Test**—This environment provides end-to-end testing. Within this environment, testers will review the major MMIS scenarios.

- **User Acceptance Test**—The Department will use this environment to validate the business features meet the finalized requirements. This environment also allows vendors to submit test

transactions. This is the final quality assurance stop before the application migration to the production environment.

- **Production**—The final stage of change management release houses the components that support the clients, providers, and support user personnel of the interChange MMIS. Performance testing will be performed in the production environment during the DDI.

- **Production Reporting**—This environment supports Production reporting and analytics.

- **Parallel**—This environment emulates the production environment to support parallel testing, where legacy system production claims will be processed to identify potential problems with data configuration, file conversions, and critical system functions.

- **Disaster Recovery**—A production-like environment supports MMIS disaster recovery business needs.

- **Training**—This environment provides the users with the latest copy of the application for user training of the features that are ready for implementation. The environment is rebuilt as needed to support the user community training needs.

- **Model Office (Simulation and Modeling)**—This environment where potential changes to adjudication rules can be tested and analyzed for scenario modeling and effect on the program.

Our teams will set up and maintain these environments with security applied at the individual environment level. The interChange security process tightly controls user access requests and the provisioning of security in each environment. This ability to provision security and to automate the workflow around security processes provides highly secure environments in a cost-efficient manner. Security auditing also can be performed to determine user access per environment. HP uses established work patterns, developed on previous successful implementations, to create the environments for the Colorado interChange implementation.

Self-documentation by having the rules in human-readable format meets the CMS vision and makes everyday research into the rules much easier for the business analyst.

Rule Engine (Unique ID 1318)

The proposed interChange MMIS integrates a highly optimized business rules engine (BRE) to provide the right rule at the appropriate time. The interChange approach enables clear and concise preadjudication rules to be configured and maintained by business analysts through our web-based interface. These business rules can be moved from environment to environment through the change management path, confirming quality at each step while reducing the risk of issues after deployment to the Production environment. The use of a business rules engine has only recently been mandated by CMS through the publication of the 7SC, the HP team has incorporated business rules engine concepts within our MMIS solution for

more than a decade. The CMS vision of the business rules engine is defined in the 7SC with the following text:

> *Use of business rules engines. States should make sure the use of business rules engines to separate business rules from core programming, and States should identify and document the business rules engines used, the manner in which the business rules engine(s) is implemented in the state's architecture, the type of business rules engine and the approximate number of rules the business rules engine(s) executes for a given business process.*

> *Submission of business rules to HHS-designated repository. States should be prepared to submit their business rules in human-readable form to an HHS repository, which will be made available to other states and to the public.*

The interChange MMIS is completely aligned to the CMS 7SC vision of the use of a business rules engine to separate business rules for easier management. Additionally, interChange exceeds the RFP requirements for a COTS Business Rules Engine within the MMIS. While interChange includes the Corticon Business Rules Engine, that functional capability is complemented with our highly optimized interChange Business Policy Management rules engine and its human-readable rules, which can be exported to an HHS rules repository.

Business Rule Management

interChange Business Policy Administration (BPA) rules are responsible for the vast majority of claims adjudication, pricing, editing, and auditing decisions. The configurability built into the BPA rules gives the Department the flexibility and scalability to use the interChange MMIS for preadjudication transaction processing for multiple programs across the MMIS enterprise. The BPA rules engine defines and processes the following rule types:

- **Provider Contract Rules**—What services a provider is allowed to perform

- **Client Plans Rules**—What services a client is eligible to receive

- **Reimbursement Rules**—Determines the appropriate pricing methodology to apply

- **Assignment Plan Rules**—What services to carve-out of a capitated managed care plan

- **TPL Rules**—What services are covered by carrier-specific rules allowing cost avoidance and recovery

- **Edit Rules**—Most edits are rule-driven through configuration

- **Audit Rules**—Most audits are rule-driven through configuration

- **Copay Rules**—Client responsibility amount

The following graphic shows how a claim will move through BPA rules engine. It shows the extensible nature of the rules and the business questions the rules address.

interChange BPA Rules Flow
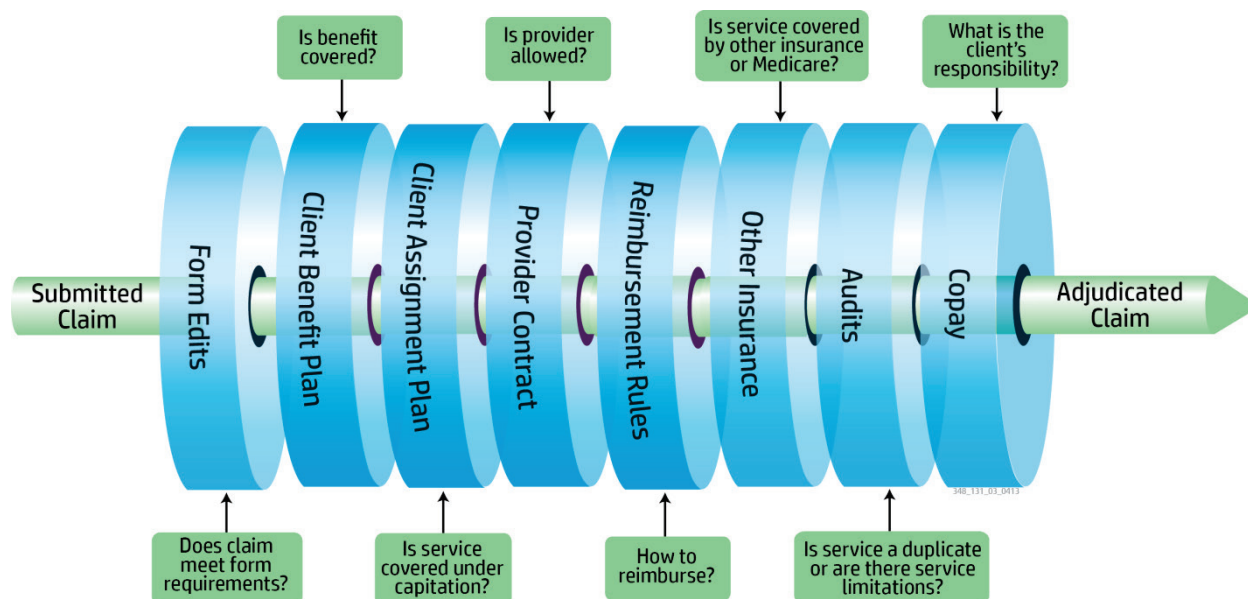
An authorized user can export, manage, and maintain the rules in a human readable form. They also can publish them to an external registry, such as an HHS repository, leading to a more standardized mode of operations between states. Not only does this fully support a "reuse and reduce" practice, it also enables the transparency of the processing logic. As mentioned, extending rules throughout the system beyond BPA is handled through the integration of a general purpose rules engine from Corticon.

The nature of managing changes to the processing rules of the interChange MMIS is vastly improved, when compared to historical MMIS solutions that had the business rules buried in program code. Instead of a technical resource making a coding change, the work is now performed through the interChange BPA Rules Engine by a business analyst who defines and maintains the business rules.

This approach makes changes faster. By defining the rules within the rules engine, it is essentially self-documenting the processing logic for the transactions.

Traceability of which rules applied to the claim is critical. interChange maintains a history of the rules that were applied in

> Self-documentation by having the rules in human readable format not only meets the CMS vision, but makes every day research into the rules much easier for the business analyst.

the processing of each claim as part of the permanent claim record on the decision rules tab. In the following figure, the business analyst can see on the Decision Rules tab the rules that applied to this claim when adjudicated.

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Every rule that was used in the processing of the claim is presented on the decision rules tab along with the level and order in which they were applied, either header or detail. As shown in the example above, some of the rules applied included "reimbursement," "other insurance," and "audit" rules. To get additional information about the particular rule, the user simply clicks on the rule they are interested in, and in a separate window the business rules editor will be displayed with the selected rule highlighted. The following screen example displays the window that appears when a user clicks on a business rule above.

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The rule that was clicked is now highlighted when displayed through the business rules editor. The English presentation of the rule is displayed, making research quick and easy for the analyst.

The ability to quickly navigate from the claim to the specific rule greatly enhances the analyst's ability to quickly and accurately perform research and assist providers and clients.

RESPONSE 38p

7.17 – System Performance Requirements	In Production? YES/NO
Description Addresses Requirements (Provide the range as applicable): 1319, 1320	YES

System Overview

HP brings more than 40 years of experience working with state governments delivering innovative health and human services solutions. We have a verifiable track record of successful implementations within a defined time frame. It is our goal to give the customer what they need when they need it, adapt to changing business demands and deliver operational service excellence. Behind the mundane term "maintenance" is the reassuring reality of a trusted, reliable HP team that will take pride in its commitment to Colorado.

CLICK FOR VIDEO

A video demonstration of the additional scenario Performance Dashboards is included in RESPONSE 47.

Managing, controlling, and optimizing the performance of each individual technical capability—and keeping the technical components together—involves interrelated tasks that are as repeatable, well-documented, and customizable as Colorado requires. We will make it easier for the Department to do its job and do it well by providing a reliable, trustworthy system. We will work hard to verify that our solution meets Colorado's expectations by minimizing downtime and providing optimal infrastructure tools that help the job get done efficiently and effectively. If downtime does occur, HP has plans in store for every scenario plausible to verify the time is minimal and taken care of with by-the-book procedures.

Performance Value

We are excited to offer the HP Colorado interChange Medicaid Enterprise system solution that provides extensive configuration and enables future program changes without costly system modifications. We understand the trade-offs between cost and availability. We carefully consider this and put an optimal solution in place. The best way to know how to create an optimal system performance and availability outcome is to have done so in the past. HP uses it experience at delivering solid quality for responsible expense the cornerstone that has made us the MMIS market leader.

Recovery Plan and Procedures

The HP DR team works directly with the customer to tailor the disaster recovery plan based on the agreed disaster recovery solution architecture and metrics. During the DR planning, three primary documents will be created, the TRP (technical recovery procedures); the DR script,

which is the sequential recovery plan; and the customer specific disaster recovery plan (as part of a complete facility recovery).

The TRP is an in-depth technical description of the recovery efforts for each part of the infrastructure. The TRP will document the step by step tasks be the documented recovery steps.

The DR script is the sequential technical tasks that are executed during either a rehearsal or an actual recovery event. For each task, it identifies the responsible team member, whether the task is performed during rehearsals, recoveries or both, and the estimated time to complete that task. Rehearsals are monitored and rated based on the completion of tasks against the estimated times.

The DR plan identifies the measures that will be taken in many given circumstances, how the recovery will be handled as either a single or global recovery. The plan also identifies the communication strategy and scope of a disaster recovery effort. The customer specific recovery plans are completed in terms that the recovery is only for Colorado or global, where the data center suffers a catastrophic failure.

HP's proposed disaster recovery solution for Colorado—shown in the following figure—is a compilation of the critical production infrastructure set inside the disaster recovery facility in Colorado Springs. HP uses a dedicated recovery data center with both dedicated and shared recovery hardware.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE
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For both solutioning and recovery, two primary metrics are used, RPO (recovery point objective) and RTO (recovery time objective). **RPO** describes the acceptable amount of data loss measured in time. **RTO** is the amount of time expected, after a declaration is made, until the system is back online (in 'recovery mode'). Colorado, now, has only defined their RTO to be less than 96 hours. The RPO has not yet been defined.

The recovery process will start immediately after authorized account personnel have declared a disaster. The recovery time objective (RTO) allows 96 hours to transfer critical production operations to the recovery facility, redirect associated network traffic, and return to regular operation.

Failover Environment

The HP solution includes numerous capabilities that enable recovery at our secondary data center. A dedicated recovery environment in Colorado Springs provides the ultimate recovery to promote continuous flow of operations so business is not impacted by natural disaster or manmade events at the primary site. The HP solution includes high-availability features such as Tier 2 equivalent data centers, multipath network links, redundant compute and storage components, application clustering, and virtualization. The primary and backup data centers are

linked with redundant, high-speed multiprotocol label switching (MPLS) network circuits that enable continuous replication of data using storage area network (SAN) based replication technology. This replication method allows for a near real-time, asynchronous update of transactions to the secondary data center's failover environment.

The Colorado interChange disaster recovery site will be in Colorado Springs, just east of the Rampart mountain range, in a stable, protected area that is free from most natural disturbances that can affect business. This secure site is separate from our main production center in Orlando, Fla. The recovery center is a Tier 2+ equivalent with a concurrently maintainable 99.982 percent availability data center as defined by the Uptime Institute. The Colorado Springs recovery facility has more than 20,000 square feet of total space with raised floors, N+1 power and cooling, UPS and generator, temperature and humidity control, central monitoring, dedicated full-time security personnel, video monitoring, keycard access, and full on-site disaster recovery rehearsal areas.

Backup and Recovery Features

Our solution is a high-speed, high-capacity approach with enterprise-class, industry-leading components and products. The recovery center will host the disaster recovery environment in a dedicated warm site model. HP will provide a warm site at Colorado Springs with data continually replicated to keep the data in both environments synchronized. This solution will allow for a rapid resumption of system operations after declaration of a primary site data center failure.

Through our experience supporting many state MMIS operations, HP has refined our backup and recovery processes, incorporating best practices from real experience. HP will perform daily or checkpoint backups and include data changes that occurred that day. HP also will perform a full backup weekly. Backup tapes and disks receive equal protection using off-site storage. Data is encrypted on the tapes for on-site and off-site storage continuing regular production level rotation and retention periods.

HP acknowledges our responsibility to maintain adequate backups to provide continued automated and manual processing. We perform automated incremental and full system backups for each of our environments. We also keep multiple copies in multiple locations to make recovery possible regardless of the type of disaster, as detailed in the following sections.

Disk Storage and Redundancy

The solution includes enterprise-class storage systems designed for organizations that cannot afford downtime or tolerate data loss. The HP storage array mitigates business downtime risk with a rigorous platform of complete hardware redundancies, hot-swappable components, and nondisruptive online upgrades.

Among the various features of the HP storage array is "Business Copy." This is a controller-based function which allows for duplicating logical disk volumes nearly instantaneously, reducing the time necessary to provide a point-in-time backup. This nondisruptive operation

allows the primary disk volume to remain online to servers for read and write I/O operations while the secondary disk volume is being created or used for making backups.

Daily Backups

For daily backups we use our HP SAN to create and hold snapshots of our primary storage (residing on high-end Fiber-Channel disks), on secondary storage, comprising high-capacity Serial Advanced Technology Attachment (SATA) drives for Tier III storage used in the Disk to Disk to Tape (D2D2T) process. We make encrypted backup copies daily to Linear Tape Open (LTO) tape media of data stored on the HP SAN to guard against unintended deletion of this data, making use of the same technology used for point-in-time recovery of our databases. We will keep these backups on tape in our tape library to make them available for recovery. We maintain the snapshot until the next snapshot has been created to facilitate a fast recovery using disk instead of tape.

Weekly Backups

Weekly we create an encrypted backup copy on a different (off-site) set of LTO tapes, which we ship to our off-site storage provider, Iron Mountain. These off-site sets of LTO tapes are for use as a backup copy of our on-site LTO tapes and for disaster recovery purposes at our disaster recovery site.

Restore

If a restore is required, the database would first be restored from the previous successful backup—a checkpoint backup—from disk or tape. Archive logs would then be applied to bring the database back to a current state before the issue occurred. The Oracle database's archive logging ability and Oracle Data Guard are important aspects of the comprehensive disaster recovery and business continuity service for the Colorado interChange solution, allowing for full or point-in-time database recovery and restart of the database. The point-in-time snapshot technology makes an instant copy of the environment, enabling point-in-time recovery of the database up to the last completed transaction.

Online Replication

The backup process is separate from, and supports the continuous online replication of the Colorado interChange data to the XP24000 storage environment at the disaster recovery facility using redundant high-speed WAN links, assisting in supporting Colorado's RTO if a natural or manmade disaster occurs at the primary site.

Data stripping on the primary storage array, data replication to the backup site, and disaster recovery support enable this multisite disaster-tolerant design to achieve complete recoverability. With enhanced data protection and security features, this decreases exposure to data loss.

Business Continuity

Our proposal response contains our business processes, methodology, and procedures for backup and recovery that form the basis for our subsequent disaster recovery and business continuity

plan. Our plan will include detailed and complete information necessary to organize efforts and reconstruct Colorado's Colorado interChange if a disaster occurs. By maintaining an aggressive system backup schedule, storage of backup information off-site, secondary site, trained and readied staff members, and comprehensive disaster recovery and business continuity plan, we can provide Colorado with full system recovery capabilities should circumstances create such a need.

Infrastructure Tools (Unique ID 1319)

HP provides a series of tools available to support staff members through the various aspects of the infrastructure. This includes an end to end approach to having the right tools available that enable asynchronous communication about the availability of the MMIS and stakeholders ability to know if they have access to the data. The tools are categorized into Dashboard reporting and Infrastructure monitoring. These tools help verify the network is up and running and that the server is working properly and efficiently by providing asynchronous data availability. We have created a well-designed solution that meets the requirements for the infrastructure tools for support staff members and Department and HP management.

interChange inSight Dashboard Reporting

HP will continue to bring new ideas, processes, and improvements to Colorado stakeholders. Our interChange inSight Dashboard is a beneficial tool for management that provides online performance reports, system management, business support measurement, and effective operational oversight. The interChange inSight Dashboard is part of the production reporting environment of the interChange MMIS and offers customizable content available at the click of a mouse. The following figures are samples of the Contact Management Dashboard and Claims Processing Statistics Dashboard using filters to sort information.

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Our dashboards provide the information to help the Department and HP make informed decisions. The dashboard's automated status reporting function will let the Department determine acceptable parameters of operation. The base dashboard architecture for interChange enables configuration of the data refresh rates. HP offers the base capability for providing dashboards and performance reports to the user's desktop in real time, delivering instant access to reliable, daily information for reports to be submitted monthly, coinciding with the Department's monthly invoicing. The information is timely; the Department does not have to depend on a weekly, monthly, or quarterly hard-copy summary of the performance activities. The information is available when needed.

Our dashboards use PowerView and PowerPivot to generate online reports to see current statuses and historical trends. The following table shows the uses and benefits to Colorado of these programs.

inSight Benefits

Product	Use and Benefit
interChange inSight Dashboard	• Allows user display KPIs to gauge the performance of the value, defined by a base measure, against a target value, also defined by a measure or an absolute value • Displays KPIs to show progress toward goals • Allows drilling down into charts and graphs to get deeper information about subcategories, which is helpful when attempting to single out information or trends • Offers geographic analysis through Bing and time progression analysis using scatter charts • Offers interactive data exploration using data visualizations, letting the user select a point on map, line on a graph, or a slice on a chart and filter other graphs, charts, and tables on the page • Creates reports in SharePoint or Excel

Our tools enhance performance measurement, processes measurement, and the ability to get information quickly. The following figure is a sample of the Contact Management Dashboard displaying color-coded KPIs.

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The dashboard is not a static picture but rather an analysis tool that lets the reviewer alter the filters and drill into the content.

Infrastructure Aspects

The following table lists the aspects for the infrastructure and their purpose.

Infrastructure Aspects

Aspect of Infrastructure	Product Name	Description
Backup	Backup Tape Media	Backup Tapes
Backup	Backup Tape Labels	Backup Tape Labels
Database	Microsoft SQL Server Enterprise Edition 2012	SQL Server Database
Operating System	Windows Server 2012 Data Center	Windows Operating System
Operating System	Windows Server 2012 Standard	Windows Operating System
Collaboration	Microsoft SharePoint 2013 CALs	Collaboration and file sharing
Collaboration	Microsoft SharePoint 2013 Server	Collaboration and file sharing
Administration	Windows Remote Desktop Server CAL	Server Remote Access
Administration	Windows Remote Desktop Service External Connectors	Server Remote Access
Virtualization	VMware vSphere 5.0 Ent Plus	Hypervisor for blades
Virtualization	VMware Center 5.0 Mgmt Server	Hypervisor Management console
Operating System	Red Hat Enterprise Linux Server	Linux Operating System for Oracle
Database	Oracle Enterprise Edition	Oracle RAC Database
Database	Oracle RAC	Oracle RAC Database
Database	Oracle Tuning	Oracle RAC Database
Database	Oracle Partitioning	Oracle RAC Database
Database	Oracle Diagnostic Pack	Oracle RAC Database
Database	Oracle Programmer	Oracle RAC Database

Aspect of Infrastructure	Product Name	Description
Project Management	SteelRay Project Analyzer	Project quality check
Project Management	Microsoft Project 2007	Project management
Design	Microsoft Visio Professional	Diagram creation
Help	Adobe Technical Communication Suite v.2.5	Help file creation
Design	Altova XMLSpy Professional	XML file creation
Code	Microsoft TFS 2010//Visual Studio	Code management
Code	Eclipse IDE	Development Environment
Code	SCCS//VCTL (Source Code Control)	Code management
Code	Apache ANT	Java build tool
Content Development	Telerick Framework	Code automated test tool
Code	Oracle Javadoc	Code documentation
Directory	Microsoft Active Directory Services (external facing)	Directory service
Security	ManageExpress AD self-Service Plus	Password self-reset
ESB	BizTalk Enterprise Interactive Server	Enterprise Service Bus
Workflow	K2 Blackpearl Workflow	Workflow
Online Forms	K2 SmartForms	Online form creation
Reporting	SAP BOBJ Desktop Web Intelligence Pro	Reporting system
EDI	Edifecs Trans Mgr, SpecBuilder	EDI transaction manager
File Management	MoveIT DMZ SFTP	Files Transfer management
File Management	MoveIT DMZ Central	Files Transfer management
File Management	MoveIT DMZ v. 7.0 API Interface Option	Files Transfer management API
Geolocation and Mailing	Pitney Bowes Spectrum Suite (Mail	Mail support and

Aspect of Infrastructure	Product Name	Description
	Support) w/GeoCoding	geolocation service
Data Management	Informatica Data Explorer Edition DMExpress Sort	Data Quality
Data Management	ERWIN Model Manager - 5 users	Data Modeler
Database Management	DBArtisan Workbench	Database management tool
Database Management	TOAD for Oracle and SQL Server	Database management tool
Claim grouping	Ingenix Easy Grouper	DRG Grouper
Website Statistics	Google Analytics	Website analytics
Scanning	Mavro Scanning Suite	File scanning
Job Scheduling	CA Job Management Option Batch Job Scheduler	Batch job scheduler
Security	Tirion MEUPS	Single Log on
Business Rules	Corticon Business Rules Server	Business Rules
Business Rules	Corticon Business Rules Modeling Studio Enterprise	Rules studio
Printing	Site Printer	Account printers
Scanning	Kodak i1120 20 PPM Duplex Color Scanner	Account scanner
PC	PCs for Training - Acct Site	Training Room PCs
PC	PCs for Call Center - Acct Site, 26 cc,	Call Center PCs
Correspondence	Mail Daemon Lsoft Listserv Maestro	Email distribution management
Network	HP Networking Equipment - DDI State Facilities	Network equipment
Data Management	OTSort	Data sorting utility
Utilities	Symantec Ghost	Server image replication
Learning	Qarbon LMS (500 seats)	Learning Management System

Aspect of Infrastructure	Product Name	Description
Learning	HP MAPIR	Learning Management System
Prescreening	HP PASRR	Prescreening application
Case Management	McKesson VITAL	Case Management application
Document Management	On Demand	Document Management
Portal	HP HCP - Client/Provider Portal	Healthcare Portal
Ticketing	HP Service Manager	ITIL ticketing system
Claims	HP interChange Batch - SORT	Claims engine
User Interface	HP interChange User Interface (Compete)	Internal user interface
File Management	HP FTS Server	File transfer system
Code	HP HP-UX Ansi C/C++ Compiler (per socket)	Code compiler
Backup	Iron Mountain Off-site Storage	Off-site secure storage
Backup	Managed Disaster Recovery	Disaster Recovery Service
Servers	HP BL460c G8	Blade servers
Servers	SuperDome2i4 (2 Boards)-2xCPUs,16Cores,128GbRAM/Board	Blade servers
Storage	Storage	SAN Storage
Security	SIEM ArcSight	Security Logging
Security	SSL Certificates	Website security
Security	EPTM	Server security
Server Management	HP Server Automation	Server Automation
Server Management	SRA Leveraged Service	Server Monitoring
Security	SSAE 16 Audit	Security Audit
Security	Full Risk Assessment Every 3 Years	Security risk assessment
Security	Penetration Testing	Penetration testing
Security	ZixMail 8/user/qtr 150 users	Secure email
Correspondence	HP Exstream	Printing Services

Aspect of Infrastructure	Product Name	Description
Performance Testing	LoadRunner Performance Training	Application and network performance testing
Project Management	HP PPM	Project Management
Application Lifecycle Management	HP ALM	Application Lifecycle Management
Mobile Management	Perfecto UFT Mobile	Mobile Application testing

Monitoring interChange

From an application perspective, we monitor and measure the interChange User Interface (UI) and database performance to verify the overall application is performing within the specified parameters. The UI is measured using our interChange UI Performance Utility that tracks the data "post backs" to the user after a data request has been made. This tool is specific to the UI and provides us direct measurement of the performance that the user community is experiencing. To provide additional control for the solution, the database administrators (DBAs) use Enterprise Manager Control Console to configure, manage, and monitor the SOA environment using a web browser–based GUI. Using this tool, the DBAs perform Oracle Database tuning and diagnostics and administer the Oracle Security Management administrative consoles.

For network infrastructure monitoring, Oracle Grid Control will be used to monitor the Oracle databases configured as a Real Application Cluster (RAC). The infrastructure components will be monitored through HP's Standard Reference Architecture (SRA). SRA is the governed combination of globally standardized and shared HP capabilities based on an integrated set of business processes, people, architecture, applications, tools, and infrastructure, which provide a cost-efficient, reusable framework for delivering IT service management.

Standard Reference Architecture

The HP Delivery teams use the SRA to support our customers. This common set of applications tools monitor and manage services enabling consistency in delivery and cross-trained staff members. The underlying infrastructure, applications, and processes used to deliver IT Service Management as the SRA include items in the following table. The MMIS Support team will automate the alert capabilities within the features of the tools to proactively communicate performance metrics.

Secured Infrastructure	Applications	Processes
U.S. Citizen Only Access	Enterprise Service Portal	Incident
Data does not leave U.S. Soil	HP Service Manager	Problem

Secured Infrastructure	Applications	Processes
FIPS Enabled	Enterprise System List	Change
SNMP V3 Enabled	CMDB+	Configuration
Secured SSL VPN Access	Business Objects	Request
HP Asset Manager	Aries/Aldea	Service Level
Event	JTOC	Asset

System Operation Time and Unscheduled Downtime (Unique ID 1320)

We will verify that our systems work as designed 24 x 7. We take production downtime seriously and aspire to meet the service level agreement (SLA) set forth by this RFP. We recognize and understand the importance of proactive monitoring of system performance. We will monitor our system performance 24 x 7 so we can verify that the MMIS is meeting the established performance requirements because we fully appreciate the importance the Colorado interChange plays in the provider and client community.

HP will validate that the unscheduled downtime because of system failure is limited by verifying that we meet the system availability and response time service levels defined in the RFP and the new system functions without interruptions from unscheduled downtimes. Notifications regarding unscheduled downtime and scheduled maintenance are evaluated to confirm occurrences do not exceed service-level thresholds. Maintenance will occur Sundays between 1 a.m.–3 a.m. MT, unless otherwise approved by the State. HP notifies the Department within 30 minutes and provides regular updates of the unscheduled maintenance or system downtime issues. Notification is in writing and denotes when we estimate the Colorado interChange or its components to be available. For the documented communication process regarding system maintenance, HP informs the appropriate stakeholders using the methods defined in the maintenance plan.

Infrastructure Service Outages

The primary objective of Incident Management is to restore regular service operation as quickly as possible, and communicate the resolution to the user. It supports the organization by seeking to minimize disruption to critical business processes, through the timely resolution of incidents in the IT environment affecting service availability and performance. Incident Management is not concerned with "fixing" the underlying problem (source) of the incident; this is managed by problem management. It simply restores users to an agreed service level in the fastest way possible, by whatever available means – this may include employing the use of a final resolution, temporary fixes or workarounds.

High-Level Incident Process Description

ITIL defines an incident as an unplanned interruption to an IT Service or reduction in the quality of an IT Service. The Incident Management process manages the daily interface between users and service providers, handling incidents which potentially affect agreed service levels. This includes events resulting from failures or queries reported through the service desk or alerts generated using event management tools. Logged incidents are categorized, prioritized, owned and progressed through to service recovery and incident resolution.

Failure of a configuration item that has not yet impacted service also is an incident, for example, failure of one disk from a mirror set. This is referred to as an "operational incident." Because operational incidents are not affecting the client (no current SLA effect), they are excluded from customer SLA reporting.

Process Benefits and Customer Business Value

An effective and enforced Incident Management process enables a service provider to add value to the business by:

- Increased stability in IT environment
- Improved service performance and availability
- Optimized service costs (operational delivery and support)
- Optimized resource usage
- IT activity aligned to business priorities
- Potential service improvements identified

Service-Level Management

Service-level management provides SLAs, which describe the targets to be achieved by incident management for restoring IT services during service disruptions. Metrics are measured and reported against incident management SLA targets and supplied to service-level management to assess service delivery and opportunities for continual service improvement. Incidents will be managed to minimize the impact of the service interruption.

Availability Requirements

HP strives for 100 percent availability for datacenter components under its and its vendor's control, such as building infrastructure and network infrastructure. Wherever possible, redundant components are used to improve availability. HP offers a wide range of monitoring, auditing, and reporting toolsets to meet availability requirement needs.

HP server infrastructure vendors have a documented infrastructure availability target and usually this is 99.99 percent availability. The HP 99.99 percent availability target is derived from the minimum availability provided by the HP data center facilities. Customer system-specific availability requirements are driven by the customer-specific SLA, the customer's system architecture, and as such, are typically unique to each customer.

Customer availability requirements are defined and provided by each customer. HP will document the customer's availability requirements and conduct an internal review to see that service capabilities requested can be delivered and provisioned. We also will review documents and supply customers the listing of service capabilities for agreement before service implementation.

HP will document installation and operation qualification reports, as well as screen shots demonstrating response times and downtime/outage functional capability.

We will retain incidents, problems, and changes in service catalog. We will provide customer availability management reports or alerts per agreement from the documented availability plan and will follow proper change management for any future changes in the availability plan.

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7.18 – Enterprise Architecture Requirements	In Production? YES/NO
Description Addresses Requirements (Provide the range as applicable): 1321, 1322, 1328, 1329, 1327, 1330, 1015	**YES**

When identifying aspects of the interChange MMIS as "In Production," we employed a conservative approach. We identified several elements of the solution as not in production even while aspects of those components have been running in production in multiple states for years.

For example, the interChange MMIS has made use of Service-Oriented Application Protocols (SOAP) for more than a decade when processing transactional data between the HP Healthcare Portal and the interChange transactional system. But for this next-generation MMIS solution, we are transitioning the services to be managed through a COTS ESB.

Additionally, while aspects of our interoperability—such as the use of Edifecs for HIPAA transaction validation and BizTalk for data mapping—have been used successfully for years supporting multiple states, the fact we are expanding our use of BizTalk for ESB management is an enhancement to the MMIS and thus labeled as not in production.

The interChange MMIS, as its name implies, is about change—or continual evolution as MITA envisions it. The proposed Colorado interChange MMIS is a production-proven application that has been certified by the latest CMS checklist. It is that core that is shared for the Department's benefit and enhanced through the proposed architecture improvements

interChange Enterprise Architecture

The National Medicaid EHI Healthcare (NMEH) work group recently concluded in its "Value of MITA" report that Medicaid programs are in an unprecedented season of change. Medicaid Information Technology Architecture (MITA) and service-oriented architecture (SOA) are revolutionary approaches to system design that enable this change and support Medicaid agencies in their ongoing mission to provide better healthcare delivery while reducing the overall cost of healthcare management.

The Colorado interChange Medicaid Enterprise system solution delivers new technologies to the Department through the most proven next-generation MMIS available in the market. The interChange MMIS delivers stronger visibility into enterprise information and quickly adapts to changing business processes and regulatory requirements, thus lowering the long-term cost of ownership.

In this section, HP responds to the enterprise architecture requirements and their respective link to achieving the Department's goals. Our response is organized into the following sections:

- Technical Architecture Overview
- Alignment to CMS 7SC
- Responses to Detailed Requirements

Technical Architecture Overview

The Colorado interChange MMIS architecture will deliver the improved adaptability and flexibility required for today's healthcare programs. Our proposed Colorado interChange MMIS is a powerful combination of a certified base, enterprise architecture principles, and an infrastructure that supports the Department's goals to continue MITA business maturity growth throughout the contract. We will explain our use of reusable assets, standard processes, and experience included in our approach to SOA and MITA. Highlights of the Colorado interChange MMIS solution include the following:

- The most CMS-certified and proven transfer MMIS available in the market

- Alignment to CMS' Seven Standards and Conditions (7SC) framework that optimally positions the Department for efficiencies today and flexibility for tomorrow

- A MITA SOA delivered at the MMIS DNA level, driving business process consistency and maturity for interoperability, adaptability, and flexibility across time

- A focus on advanced healthcare portal technologies that emphasizes self-service healthcare management for providers and clients

- Industry "top-quadrant" COTS tools that deliver advanced business features

- Integrated workflow, rules, correspondence, and document management business services

- A private cloud infrastructure designed for efficient and flexible provisioning of high-performance computing, storage, and network capacity

- Robust security including Multi-Protocol Label Switching (MPLS) wide area network (WAN) supported by high-performance Cisco and HP network routers, switches, firewalls, and intrusion prevention systems (IPS)

- Inherent scalability and comprehensive solution security required to serve the clients, providers, trading partners, and the Department

The Colorado interChange MMIS completely matches the architectural vision established within the Department. The following table summarizes the tight association between the Department's technical architectural guidelines and our solution.

interChange MMIS Enterprise Architecture Goal Alignment

| Department Goals	interChange MMIS Architecture Alignment
Emphasize the use of services	The interChange MMIS is based on a SOA that facilitates the use of components through services to support plug-and-play capabilities. At the heart of the service-based approach is the interChange Connections module that includes the enterprise service bus (ESB) for orchestration of the business and technical services. The interChange MMIS best positions the Department to meet the business challenges for today and tomorrow by using the principles of service orientation.
Adaptability	The solution includes the interChange Business Services Framework, providing the SOA integration definition and structure that enables the promotion of loosely coupled services and facilitating interoperability to the broader Colorado healthcare environments. The modular solution effectively delivers information to business analysts and program managers, enhancing decision-making and increasing management efficiencies.
Information Sharing.	The Healthcare Provider and Client portals provide unprecedented self-service that delivers the information sharing required to efficiently and effectively engage the provider and client communities. The HP Healthcare Portal delivers on the CMS vision of delivering a 21st-century healthcare experience to the stakeholders of the program.
Interoperability	The interChange Connections module manages the interoperability of the MMIS. The Connections module includes an ESB that extends the MMIS to the broader healthcare ecosystem in a tightly managed and adaptable manner.
Configuration and Customization	The interChange MMIS has been carefully designed to enable configuration and customization at each level of the architecture. From the user experience where the user-driven configuration enables each business analyst to personalize their business experience to the configuration of business policy rules and the customization of workflows to meet Department-specific business processes, the interChange MMIS provides an architectural framework that delivers long-term value throughout the contract.

As documented in the previous table, the Colorado interChange MMIS solution directly aligns with the Department's goals. The interChange MMIS delivers a solution, based on services and process maturity that delivers a long lifespan cost-effectively. The proposed solution meets the

Department's technical architecture requirements—including scalability, configurability, capacity, extensibility, adaptability, performance, availability, stability, and security.

Why the HP Adaptable Approach Is the Best Solution for the Department

HP has been actively evolving our interChange MMIS business functions, incorporating MITA and 7SCs guidelines through the addition of advanced features and architectural capabilities. The result of our efforts is a solution at the forefront of configurability. The following figure highlights aspects of our approach that enables adaptability so the interChange MMIS will evolve with the continuing changes in healthcare.

interChange Configurability Across the Architecture
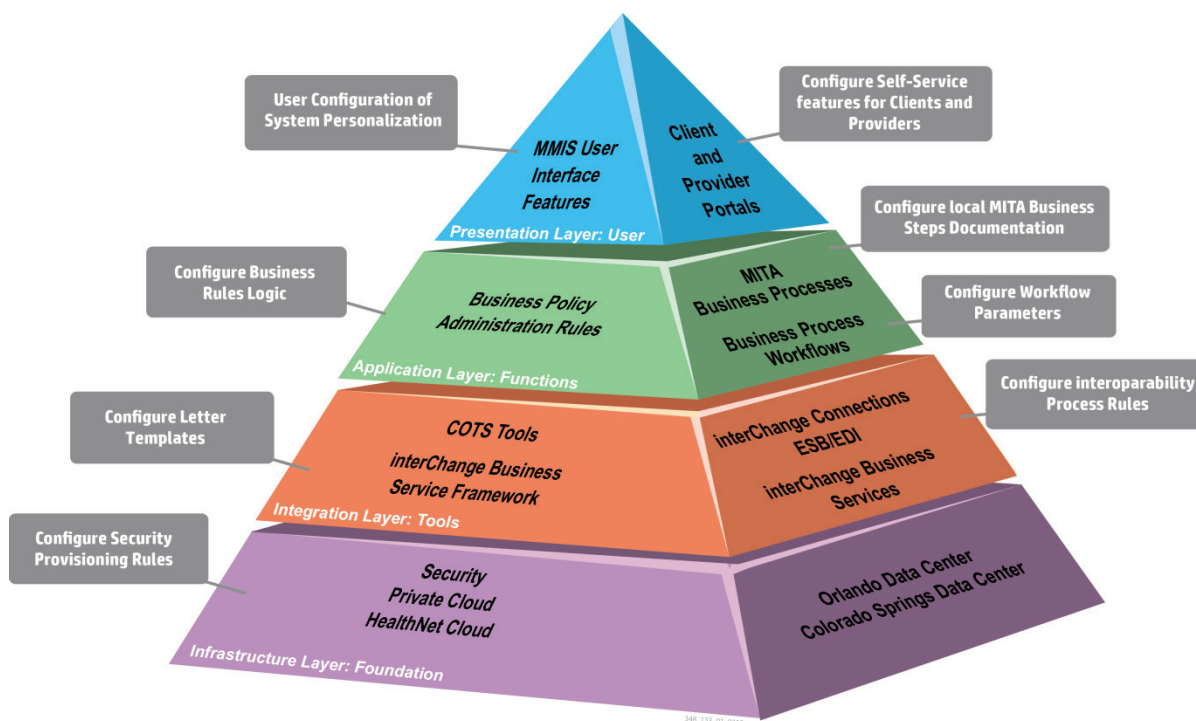
Our approach—configurability at every layer of the solution—increases the flexibility and adaptability of our solution to the constantly evolving healthcare landscape. By continually adapting, the solution meets the business challenges of today and tomorrow. This end-to-end, enterprise approach to configurability is why the interChange MMIS is the best long-term value for Colorado.

Through the remainder of this section, we present the proposed interChange MMIS enterprise architecture. First the application, infrastructure, network, and data architecture will be presented. Then we will show how the interChange MMIS architecture aligns within the CMS 7SC. We intentionally present the information in this manner because a critical aspect of the Department and HP's success during the implementation of the solution will require articulating the capabilities within the 7SC framework to CMS. For each implementation moving forward, this is a federal requirement, and HP is ahead of the game by already creating a solution-mapping tool

that makes documentation, tracking, and communication of the 7SC alignment an activity throughout the implementation. The remainder of the enterprise architecture response is organized into the following sections:

- Application Architecture
- Infrastructure Architecture
- Network Architecture
- Data and Information Architecture

Application Architecture

Through the Colorado interChange MMIS architecture solution, the Department can respond faster to regulatory, programmatic, and technology changes because HP's proposed solutions and services are standards-based, adaptable, and extensible. A combination of proven approaches to security and privacy and the technical and business architecture provides easier access to data and information across the MMIS. At the heart of the interChange MMIS is the CMS-certified Wisconsin MMIS, the first MMIS to successfully be evaluated and certified through CMS' new MITA Certification Toolkit certification process. Throughout the application architecture, COTS packages are integrated with the MMIS to present service-based modules. The result is an efficient, business-feature-rich solution for the users.

The interChange MMIS contains our secure, public-facing web portals as the access channel for clients, providers, and trading allies. CMS reviewers identified the business services provided through the HP web portal as a best practice. This is an example of the attributes we are bringing with the interChange web portal in Colorado. To complement these applications, we also are incorporating the Case Management Tool from McKesson Care Management.

In Wisconsin, the interChange MMIS has demonstrated its adaptability and capability to support changes in the healthcare program through the implementation of 1,000 work items in less than a year. Forty-one of the work items have accounted for an estimated savings of $350 million in benefit expenditures.

The overall purpose of the technical architecture, as defined within MITA, is to provide a layered, modular healthcare solution for greater overall flexibility. The interChange MMIS architectural solution provides a logical separation across layers that are implemented independent of the underlying platform. This includes services that support the various layers and component interaction. The services are initiated using standard methods in the invocation of the functions supported.

The overall architecture schematic in the following figure includes an overview of the interChange MMIS application architecture, its functional layers, and how the interoperable layers relate to each other. The presentation layer depicts the various access channels that the

stakeholders have to the solution. The integration services layer depicts the interChange Business Service Framework components: interChange Connections and interChange Workflow. interChange Connections provides secure and highly efficient management of healthcare data sets and the business-to-business connections required to manage the new-generation MMIS. interChange Workflow orchestrates human and machine-based business activities. The application layer depicts the major application components in the interChange MMIS base system and the proven COTS application components integrated within the overall solution.

Finally, the data layer illustrates the delineation of the data management and data sharing used for the business functions. The interChange MMIS is the SOA-enabled solution that best positions the Department to continually mature the business processes supported by the MMIS.

The proposed architecture provides a level of reliability and adaptability that older MMISs and unproven start-up solutions cannot provide. Our MMIS is built to foster adaptability to evolve as state healthcare programs change. From our Business Policy Administration configuration features to our integrated, configurable COTS packages, our solution can be adjusted and configured to meet changing business demands as healthcare in Colorado changes.

The following figure shows the integration between the layers of the MMIS, including external stakeholders. This configuration results in a solution that is flexible, configurable, and scalable.

The interChange MMIS architecture harnesses the right technology and organizes it to produce effective results as established through the vision of the CMS 7SC. One portion of the 7SC encourages meeting the MITA goals. The interChange MMIS was built using the MITA principles of adaptability, configurability, flexibility, scalability, performance, extensibility, and security.

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By keeping these principles at the core of our system development and maintenance, interChange MMIS supports more providers and provides administrative support for more clients than any other MMIS available. HP continually invests in interChange to share lessons learned from our customers and advancements in technology. The proof of this success is that more states have selected interChange during the past 10 years than all other vendor solutions combined, with 13 operational installations and 12 CMS certifications to date.

interChange Businesses Services Framework

The need for the MMIS to interact within a broader healthcare environment has never been stronger. A key to the future success of the interChange MMIS is how the components are integrated in a manner that facilitates business efficiencies. Enabling these business efficiencies is the interChange Business Service Framework, which provides the capability for SOA integration in an enterprise environment. At the heart of the Business Services Framework are two components. The interChange Connections component provides the Electronic Data InterChange (EDI) and ESB services. It provides service orchestration, rules-based routing, event-based messaging and the data translation and transformation adapters necessary to

integrate into the larger Colorado healthcare ecosystem. Anchoring this capability is Edifecs for Colorado-specific transaction compliance checking and the Microsoft BizTalk ESB. Together, these leading COTS packages and HP integration make for an industry-leading, high-volume file service solution.

The second services component is the interChange Business Process Management, which enables human workflow and business rules application. Working together, the Corticon rules engine and the K2 workflow engine form the basis of our interChange Business Services Framework for standardized business processes. This framework provides a layer of abstraction through an integration and messaging backbone with the capability to incrementally develop interfaces and expose them as web services. This structure allows for SOA integration of these services throughout the interChange MMIS.

The following figure illustrates how the interChange MMIS is a business-centric solution providing leadership insight into the effectiveness and efficiency of supporting business functions. The Workflow component manages and integrates human and machine tasks, supported by a high-speed business rules engine (BRE).

Each process contains unique business logic that triggers chains of decision-making events. Subject-matter experts and users guide the process development in a visually-designed collaborative environment that addresses what the users actually do, rather than what the IT department thinks is done. When combined with HP's technical and business healthcare expertise, the workflow and business rules capabilities of the interChange Business Services solution dramatically increases user productivity, business process quality, and transparency.

interChange Connections can significantly reduce the impact of changing business needs by removing the link between data delivery and business processing.

Through a SOA approach that centralizes management of business monitoring, the interChange Business Services Framework simplifies the process of tracking business activities. The analyst work list is the one-stop portal presenting a single view of their assigned tasks integrated directly into the interChange web user interface (UI). Efficient screens save analysts time and keystrokes because a single environment allows them to perform their jobs, such as enrolling providers or updating third-party liability. Workflow orchestration automatically presents the next required screen, filled with the appropriate data, based on the choices already selected.

The feature-rich, process-driven, visual workflow designer allows analysts and technical professionals to define and deploy the appropriate role security, queues, business logic, notification, redirection, escalation, and exception processes. Design wizards automatically

create web services that interact with services-enabled applications, such as the HP Exstream Correspondence Generator, and electronic document management systems such as IBM OnDemand or a contact tracking system. Business Activity Monitoring (BAM) is available in a web console view, in easy-to-define reports, and charts that provide clear insight into the overall performance of a department or single individual. Because each individual process is monitored, it is easy to generate Key Process Indicator (KPI) reporting for early warning when intervention is required, to keep the system operating within specified parameters. This proactive view allows problems to be recognized before they happen, rather than the next day. If questions arise, audit logs graphically depict the actual flow through a specific workflow instance using colored lines, removing the guesswork of exactly which decisions were made.

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interChange MMIS Application COTS Software Highlights

While we have detailed how the COTS packages are implemented to service the overall solution, understanding how HP selected specific tools is just as important. When evaluating the options, our team used our extensive experience, our HP Agility Alliance expert vendor support, and

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independent industry reports such as Gartner and Forrester. The COTS packages we have selected for the interChange MMIS are rated in the "top right quadrant," meaning these packages and vendors are leaders in their respective segments with a completeness of vision and strong ability to execute. This translates into leading business features being integrated into the overall solution.

The following table highlights some of the most prominent packages and their use in the solution. We have included the rationale for each of these parts of the solution and additional documentation for important parts of the Colorado interChange MMIS solution for the Department's consideration.

interChange MMIS Tools

Business Feature	COTS Package	The Right Tool for the interChange MMIS
Transaction Data Repository	Oracle RDBMS	HP has a long history of success using the Oracle relational database in Medicaid and will continue that lineage with the database deployed in new ways that directly map to the architectural principles of scalability and security.
Interoperability	Microsoft BizTalk ESB	The BizTalk ESB is a market-leading ESB. It is designed to connect, mediate, and manage interactions among heterogeneous services, applications, and multiple ESB instances across a service network.
Workflow	K2 blackpearl	K2 blackpearl provides end-to-end workflow orchestration and management integrated directly within the interChange UI application. This coordinated approach to workflow provides unparalleled process maturity and transparency to the MMIS business processes.
Rules Engine	Progress Software Corticon Business Rules Engine	Corticon rules engine is used to define configurable business rules within the application. Corticon is ranked as a BRE leader by Gartner (Magic Quadrant) and Forrester (WAVE).
Content Management	Microsoft SharePoint	SharePoint is a market leader in content management as a means of providing secure storage and easy user navigation to content required to support large business enterprises. With integration to workflows and the ESB, it will allow for more flexible and advanced functions than SharePoint alone.

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Business Feature	COTS Package	The Right Tool for the interChange MMIS
Correspondence Management	HP Exstream	HP Exstream was selected as part of the interChange MMIS based on its recognized industry-leading features and ability to deliver. Through HP Exstream, the solution standardizes "constituent experience" with a common look and feel across the letters and publications. HP Exstream is an SOA-enabled application.
Document Management	IBM OnDemand	IBM OnDemand will serve as the electronic document management solution for Colorado. With this interChange MMIS implementation, our teams will be implementing the OnDemand interface that includes SOA capabilities to enable document management integration to the interChange MMIS.
Project Management	HP PPM	HP PPM provides overall project management, schedule management, risk, and issue management and status reporting. With the HP PPM approach, the Department has visibility into everything that's being worked on—including project health metrics, active issues, and risk management.
Requirements and Testing Management	HP Application Lifecycle Management (ALM)	HP ALM allows for requirements management and testing management. HP ALM and HP PPM integrate to provide a comprehensive set of tools delivering traceability and transparency to the tasks of project management and each aspect of testing.

Infrastructure Architecture

The HP Colorado interChange MMIS technical architecture will be a private cloud infrastructure, delivered through a next-generation, standards-based IT architecture that merges virtualized compute, storage, and networks with facilities into a single shared services environment optimized for the workload of an MMIS—and the security requirements of an MMIS. This unique approach will help the Department accelerate the delivery of applications, optimize application resources on demand, and deliver predictable levels of service that make the most efficient use of IT, facility, and staff resources to drive business innovation and outcomes. This results in better IT performance and easier management. The following figure illustrates the interChange MMIS private cloud infrastructure and how the stakeholders use the access channels to interact with the cloud.

The objective of the cloud architecture is to provide an efficient and cost-effective common IT infrastructure that does everything. The result is a common, mission-critical platform from x86 to Superdome systems. By standardizing the way we design, deploy, and manage systems, the blade-scale architecture lets Colorado certify once, train once, and deploy once.

Virtualization enables the dynamic provisioning and management of resources to adjust to fluctuations in the business workloads, shifts in business strategies, and changes in the MMIS load. Virtualization also allows management through a single console and provides the ability to automatically provision or save work images for rapid disaster recovery.

Cloud computing is a powerful way to deliver services more efficiently. In short, it allows the Department to access highly scalable and flexible resources and services, as needed. The HP private cloud provides the flexibility and economics of cloud computing while retaining the security, transparency, and control the Department requires.

Mission-Critical Data Centers

TECHNOLOGY HIGHLIGHT

The Colorado interChange solution will be housed in our Florida and Colorado data centers. For the production and nonproduction environments, we will install the next-generation Colorado interChange MMIS in our Orlando Data Center (ODC) in Florida. The ODC is a Tier 3 data center that will provide excellent infrastructure service to the benefit of the Department, the clients, and the providers as a smooth migration during the interChange MMIS implementation. A Tier 3 data center comprises redundant and diverse power and network services to sustain 72 hours of power outage protection.

The ODC is HP's preferred Medicaid information processing center. This data center is specifically equipped for handling government healthcare customers and the strict operating protocols that are required. The data center and the support staff follows ITIL processes for efficient management of the services provided. Its facilities and services are designed for high security, privacy, and business continuity. It supports numerous states running HP's interChange MMIS. Its experienced support team is trained in the HIPAA, HITECH, and other privacy and security requirements mandated by the RFP. Nonproduction and production environments supporting Colorado will operate at this facility, except for the disaster recovery environment.

Based on Colorado's requirement for disaster recovery and secondary site failover, HP will provide an alternate dedicated site in Colorado Springs. This is HP's preferred Medicaid disaster recovery center and supports numerous states today. This facility also meets HIPAA and other security and privacy requirements. The network circuits designated for replication are already in place between Orlando and Colorado Springs. They have been tested and proven in disaster recovery drills for other states. HP already has operational and disaster recovery processes and procedures in place for operating each of these facilities.

The recovery center will host the disaster recovery environment in a dedicated model. Data will be continually replicated between both facilities to keep both environments synchronized. This feature will allow HP to quickly resume system operations on declaration of a primary site data center disaster.

Market-Leading Computing and Storage Components

TECHNOLOGY HIGHLIGHT

The HP Colorado interChange MMIS solution uses the HP Superdome 2 and ProLiant computing systems with the HP BladeSystem architecture to deliver mission-critical computing. With a blade-based design, HP builds a common infrastructure to support the Department. The MMIS infrastructure provides a robust platform while being flexible to adjust to the needs of tomorrow. The following sections describe our key infrastructure building blocks.

HP Integrity Superdome 2 Batch Servers

The Superdome 2 is the ultimate mission-critical consolidation platform for healthcare. This category of modular systems scales up, out, and within to consolidate the applications tiers on a common platform. The Superdome 2 provides as many as four times the performance compared to prior Superdome systems, thus providing increased operational performance. This platform is extremely scalable and reliable, with fault tolerance in 100 percent of the chipset data paths. It is one of the only systems available to scale I/O, memory, and processor on-demand to precisely provision and repurpose capacity where needed. The Superdome 2 platform comprises our core computing foundation for interChange MMIS claims processing. These servers deliver the massive scale and ultimate performance required to meet the Department's growing needs.

HP processed more than $94 billion in payments for FFS claims in 2011.

HP ProLiant BL460c G8 Server Blade Application and Database Servers

The BL460c G8 simplifies network connections and delivers cost-effective, scalable, dense two-processor, 24-core performance for virtualization and compute-intensive applications. The BL460c G8 provides many features that enable HP to build a solution specific to the Colorado environment and application needs. The BL460c G8 will be used for web, application, and database tier requirements in support of the COTS packages and middleware applications. The BL460c G8 includes an integrated 10Gb Converged Network Adapter, which merges LAN and storage area network (SAN) traffic across a single flexible connection. This converged network technology simplifies administration while enabling each blade's bandwidth to be tuned, based on the capacity requirements of each individual blade.

The BL460 G8 constitutes the foundation for HP's proposed VMware virtualization solution. These combined technologies provide scalability and flexibility by enabling VMware to autonomously move active VMs to another physical blade host when the existing host nears its

capacity limits. The HP BladeSystem c7000 Enclosure platform supports as many as 16 BL460 G8 blades while integrating server, storage, networking, and power management into a unified solution. This platform will support future generation blade technologies with interchangeable components, minimizing the cost of capacity upgrades and expansion.

HP StorageWorks XP 24000 Disk Array

HP proposes the HP StorageWorks XP 24000 (XP24k) Disk Array as our primary storage platform. The XP24k is a large, enterprise-class storage system designed for organizations that simply cannot afford downtime or tolerate data loss. The XP24k mitigates the risk of business downtime by providing a robust platform with complete hardware redundancies, hot-swappable components, and nondisruptive online upgrades.

High-Availability Infrastructure for Business Continuity

The infrastructure of the MMIS provides a robust platform that supports the MMIS needs of today and is flexible to adjust to the needs of tomorrow. HP will meet the system availability and response time service levels defined in the RFP and verify that the new system functions without interruptions from unscheduled downtimes. The HP solution incorporates high-availability features such as Tier 3 data centers, multipath network links, redundant compute and storage components, application clustering, and virtualization. Additionally, the HP solution includes numerous capabilities that enable failover at our primary and backup data center. A dedicated failover environment at our backup data center in Colorado Springs provides the ultimate recovery to promote continuous flow of operations so business is not impacted by a disaster at the primary site.

The primary and backup data centers are linked with redundant, high-speed MPLS network circuits that enable continuous replication of data using SAN and image-based replication technologies. For example, HP uses Oracle Database Enterprise Edition with replication to keep both data centers' databases synchronized. This allows for rapid updates of transactions to the backup data centers failover environment for 24 x 7 access to data. This approach verifies that critical systems are available 24 x 7, except for scheduled downtime.

In Wisconsin, the interChange MMIS and infrastructure support many healthcare programs through a single installation of the solution. The MMIS supports the traditional Medicaid and CHIP populations, the Chronic Disease Program, the Well Woman's Program, and BadgerCare Health Insurance Premium Payments. This demonstrated flexibility provides a tremendous return on the MMIS investment for the state. These multi-payer support capabilities can be configured to support Colorado's healthcare needs.

Network Architecture

The Colorado interChange MMIS provides a high-availability secure network for the mission-critical solution. Our team has carefully studied the requirements and performance criteria defined in the RFP to develop this network solution.

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HP manages the Customer Edge (CE) devices, while Verizon Business Services provides the connectivity. The solution includes redundancy for the critical connections to eliminate single points of failure. The proposed network can automatically switch pathways if a primary connection goes offline. This design is required to meet the needs of the MMIS, to provide continual connectivity for the providers, trading partners, Department staff members, HP staff members, and Colorado clients who are served by the interChange MMIS solution.

Scalability was a key consideration in the Colorado interChange network design. The solution is designed with the ability to increase capacity while minimizing costly hardware replacements. When capacity adjustments are needed, they can normally be accomplished without any downtime.

As shown in the following figure, the main HP sites include the local Denver offices, our Orlando primary information processing location, our disaster recovery locations, our print center, and help desk operations site.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE DEPARTMENT AND HAS BEEN REDACTED

Our robust healthcare network is highly secure. Our security approach includes the following features:

- Traffic will traverse the WAN within IPSEC encryption tunnels
- Intrusion detection and prevention systems are applied at each access point
- Multiple managed firewalls limit traffic to only what is required

Data and Information Architecture

To explain the makeup of the interChange MMIS data architecture, we present the solution by breaking it down into the following subsections:

- Data Structures
- Data Flow Management

The data architecture incorporates how the MMIS data is stored, how it is moved, and how the interChange MMIS metadata extends to the broader state healthcare enterprise.

HP will employ the enterprise editions of Oracle Relational Database Management System (RDBMS) products for the transactional MMIS components. This includes several Oracle add-on products such as Oracle Tuning, Diagnostics, Provisioning, and Partitioning to enhance our database management capabilities. The Oracle database will include the Real Application Clusters (RAC) module which is a key component of Oracle's private cloud architecture. This increases reliability by pooling together multiple physical blades/nodes, to verify sustained operations in case of a hardware failure. HP uses best-in-class analysis tools—Computer Associates' ERwin for data modeling and Informatica's Data Explorer for data profiling during data conversion. These tools, along with additional market-leading database products, allow HP to create a data infrastructure that is easily configurable and role-based, with 24 x 7 access to data, excluding scheduled system maintenance time.
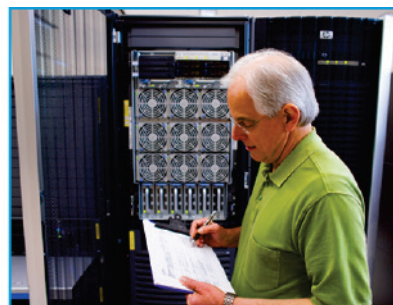
Data Structures

The data and application layers of the MMIS are separate layers of the interChange MMIS architecture framework. An MMIS is a large enterprise solution comprising technical, application, network, and data architectures. The base MMIS includes data structures that have demonstrated their flexibility. The transfer to Colorado contains a proven multipayer open data model that has been deployed in multiple states. Other vendors have rigid data models that force state business practices into their singular vision of the business. The HP interChange model establishes table structures, relationships, naming conventions, and change management procedures that allow us to bring a proven base to the Colorado interChange MMIS. This includes the online transaction processing (OLTP) data model for high-performance transactional processing and online analytical processing (OLAP) data model for effective MMIS MAR and inSight Dashboard reporting. These interChange online reporting capabilities are useful to the operational staff as they actively manage the business operations.

Our solution segments the MAR and dashboard reporting architecture from the transactional processing architecture based on a best practice approach refined across 13 successful interChange MMIS and reporting solution implementations. Although the separate BIDM solution will support ad hoc requests, the MMIS analytical reporting structure will provide our support team immediate access to the most common data attributes. This accelerates our team's ability to perform operational research as requests arise.

The proposed Core MMIS has demonstrated its scalability through the high-volume production metrics recorded by our Florida account. The MMIS processes more than 300,000 claims daily and has handled more than 800,000 claims in a single day. It also processes more than 65,000 eligibility inquiries a day, serving 110,000 providers and 3.1 million members.

Data Flow Management

HP's interChange Connections module offers readily available channels for HIPAA transaction management. This HIPAA-compliant system is based on a three-tier architecture that separates external communication, application, and data layers. Reliability and performance are the foundation of the SOA and clustered infrastructure. This is built to deliver high-availability, fault-tolerant, and highly secure EDI services. The architecture is flexible, scalable, and allows for rapid document turnaround. It supports numerous communication protocols, file types, and integration capabilities. It can quickly integrate, manage, and automate dynamic business processes by exchanging business documents among applications, within or across organizational boundaries.

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The ESB/EDI solution is extensible to permit the integration of additional value-added services. A significant advantage of the interChange data management solution is our File Tracking System that provides a single conduit for the MMIS Support team to manage the file exchanges with MMIS stakeholders.

Advantages of Proposed interChange MMIS Technical Architecture

The Colorado interChange MMIS solution is an innovative, feature-rich, flexible solution that delivers the strongest short- and long-term value for the Department. It is built on a proven MMIS core that has been fully certified using the latest CMS MITA Certification Toolkit. Based on the CMS evaluation, many interChange business features were identified as industry best practices.

The new Colorado interChange MMIS will deliver the following technical and business features:

- Direct alignment with the State of Colorado Enterprise Architectural goals of SOA enablement, using services for a loosely coupled set of components that take advantage of COTS packages

- Increased self-service resources for clients and providers through a secure public portal that simplifies healthcare management

- A services framework that facilitates the process efficiencies of today while being adaptive to the changing business needs

- Flexibility to quickly configure benefit administration policy rules as the program evolves across time, making it easier to invoke policy changes

- Highly protected information through a secure, private cloud infrastructure

- Increased maturity of the MITA business functions through a SOA framework supported by a top-tier ESB and services-enabled interfaces

The HP healthcare expert teams continually deliver success to the MMIS market by building on these proven technical solutions and mature processes. HP looks forward to delivering these same comprehensive benefits to Colorado.

The HP interChange MMIS directly aligns to the CMS 7SC. The combination of this solution's capabilities, along with the ability to articulate the alignment within the framework, is critical for HP and the Department to gain CMS approval. HP has already mapped the advanced features of the MMIS within the CMS 7SC evaluation template, which guides the documentation and communication effort.

Alignment to CMS Seven Standards and Conditions

The following figure documents our core MMIS framework components and COTS packages. This is a graphical representation of how our base MMIS solution meets the 7SC and the growth in maturity through the DDI efforts. The base system will evolve as it is enhanced to address even higher maturity levels of the 7SC.

interChange MMIS Framework

SEVEN STANDARDS AND CONDITIONS	BASE MMIS	ORIGINAL STATE	MATURITY GROWTH			DDI MATURITY STATE	INTERCHANGE CORE MMIS
Modularity Standard	BPA Rules, Proprietary Portal, integrated Care Management						interChange Connections, Healthcare Portal, SOA Framework, BPA Rules, COTS rules engine, HP Exstream
MITA Condition	MITA-Aligned business processes, MITA-Aligned data model						MITA Business Process Document, integrated workflow, interChange Connections, Cloud infrastructure, Concept of Operations, MITA-Aligned business processes and data model
Industry Standards Condition	HIPAA, Edifecs compliance checking						HIPAA, Enhanced Web Services, interChange Connections, MAPIR, CAQH Operating rules
Leverage Condition	BPA rules, Edifecs compliance checking						BPA Rules, MAPIR, interChange Connections, HP Exstream, Cloud Infrastructure
Business Results Condition	Browser-Based UI, BPA rules, proprietary Portal, SLA/ KPI reporting						Insight, Workflow, interChange Connections, Enhanced UI, BPA rules, @neTouch features, Healthcare Portal including member support, HP ALM
Reporting Condition	BusinessObjects, Browser-Based ad hoc reporting						interChange Connections, Insight, BusinessObjects, Browser-Based ad hoc reporting, API, Cloud
Interoperability Condition	Data Security Management, secure file transfer						Informatica, interChange Connections, Data Security Management, Published Services

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The base interChange MMIS starts from a strong position and is then further enhanced through the additions we document in the fourth column of the preceding figure, to achieve an even greater maturity level.

Modularity Standard

The Modularity Standard sets a vision of a modular, flexible approach to systems development. This incorporates SOA, exposed APIs, and a business rules engine, for streamlined submission of business rules to a Department-designated repository. The interChange MMIS employs a demonstrated 3-tier architecture that places an emphasis on reuse and flexibility. The following component overview figure illustrates how the MMIS MITA business area modules are supported across the MMIS enterprise using the COTS packages. It further describes how the interChange Connections module provides the interoperability between the MMIS and the stakeholders.

This solution approach increases the Department's return on investment and aligns with CMS' 7SC. The interChange MMIS framework facilitates the use and reuse of modular solution components, saving development time for the Department and HP. This approach reduces long-term investment costs, because we can share and reuse solutions across business areas within the interChange MMIS. To achieve the goals of maximizing reuse and business service flexibility, the interChange MMIS makes extensive use of specialized COTS packages and HP-developed components; including the Healthcare Portal.

SOA

HP built the processing platform on a SOA framework, supported by web and business services. Through data translation adaptors, we can readily transform data from one format to another, allowing a more interoperable data exchange. The Colorado interChange MMIS delivers increased maturity of the MITA business functions through a SOA framework supported by interChange Connections, which includes a top-tier ESB and services-enabled interfaces. Additionally, SOA, rules engines, and table-driven features at the application level in the Colorado interChange help simplify configurability without the need to hard code changes within the system code.

Open APIs

Open APIs support interoperability while easing system and component integration. Standardized interfaces and functions across components support better health outcomes by simplifying the integration with internal and external systems. Clearly defined APIs connect interChange components, including HP Exstream for correspondence management and the HP Healthcare Portal components.

MMIS Rules Engine

The proposed Colorado interChange MMIS is a web-accessed healthcare management system that integrates highly optimized, purpose-built rules, along with a BRE that provides the appropriate rule at the right time. Our Colorado business services functions include workflow management and business rules execution.

Business Rule Submission to Department-Designated Repository

The interChange MMIS Business Policy Administration (BPA) rules are responsible for most claims adjudication, pricing, editing, and auditing decisions. The configurability built into the BPA rules gives the Department the capability to use the Colorado interChange MMIS for multiple programs transaction processing. Through this rules engine, the business logic is configured and maintained by business analysts, rather than technical support team members. The following figure summarizes the breadth of the interChange BPA rules engine and the business questions it addresses when processing transactions.

interChange Business Policy Administration Rules Engine
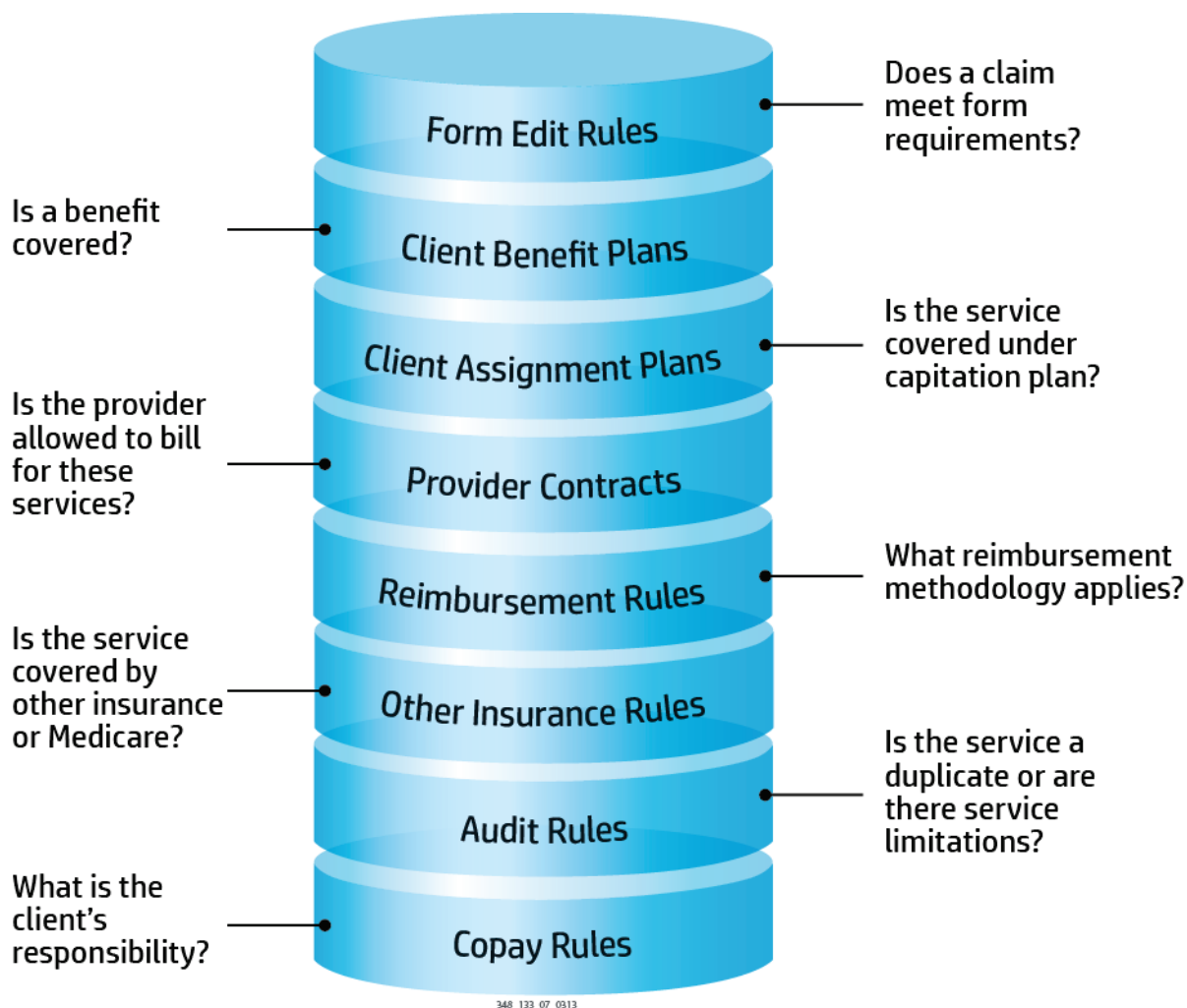
The authorized user can export, manage, and maintain the rules outside of the system in a human-readable form. They can publish them to an external registry, such as a Department repository, to promote a more standardized mode of operations between states. This fully supports a "reuse and reduce" practice and enables the transparency of the processing logic.

MITA Condition

This CMS 7SC condition sets the direction to align with MITA maturity for business, architecture, and data. It includes state self-assessments (SS-As), road maps, concept of operations, and business process models. HP understands how business requirements drive technical solutions. Our teams focus on the MITA principles supported by the interChange solution—aligning and advancing business, architecture, and data in MITA maturity. The following figure highlights how the new interChange MMIS UI closely aligns with MITA business processes, presenting the most common MITA business process functions performed through a specific business screen.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE
DEPARTMENT AND HAS BEEN REDACTED

Understanding that any growing structure or program advances when its foundation is sound, HP continues to refine the interChange MMIS solution across years of implementations to continue to deliver a solid solution for our customers. The Department will have this solid foundation—a proven, certified MMIS on which it can move forward to build a growing and evolving enterprise solution.

State Self-Assessments and Roadmaps

If desired, HP will support the Department to complete an updated SS-A in the period prescribed by the MITA 3.0 guidance. The interChange MMIS solution that HP proposes for Colorado is designed to meet the guidance of the CMS 7SC in the near term with its SOA, modular components, integrated COTS packages, and open standards. As the architectural foundation of the Colorado healthcare ecosystem, the interChange MMIS will provide the strong yet flexible infrastructure to support the CMS 7SC road map of increased processing maturity and capability.

Concept of Operations and Business Process Models

The Colorado interChange MMIS workflow standardizes business processes, enhances efficiency, optimizes outcomes, and brings greater maturity to the MMIS concept of operations. Business owners have complete control in generating and updating the MITA process documentation that is available through the Colorado interChange's UI. This enables process growth from idea to implementation across the entire business community in less time.

Using the Colorado interChange MMIS workflow, a user can configure the following:

- Where the workflow triggers are logically located throughout the UI

- The quality management workflow step of when to send workflow processes to quality review for configurable quality management

- The workflow escalation rules so that the Department and HP leadership receive timely notification of processes that exceed defined thresholds

As a secure, regulations-compliant platform, the HP Colorado Healthcare Portal will set the foundation for a 24 x 7 self-service healthcare model, except for maintenance windows. Colorado's user community will find several levels of support while completing tasks such as submitting a claim, inquiring on eligibility, or enrolling as a provider. This self-service support comes through guided self-validating forms, online contextual help, and published guides.

Industry Standards Condition

This condition defines the alignment to and incorporation of industry standards (HIPAA, 508 of Rehabilitation Act, 1104 and 1561 of Affordable Care Act). Industry standards provide a common and transferable language that government entities, health plans, and providers can use to communicate healthcare services and information. These common standards enable interoperability, while reducing the administrative burden on providers, health plans, and clients.

Identification of Industry Standards

The Medicaid program is continually evolving. HP will use our experience and knowledge from implementing new federal regulations in other HP state Medicaid programs, to incorporate innovative ideas into Colorado. We have access to the shared knowledge of our other Medicaid, Medicare, and commercial healthcare support teams. Our team members continually share knowledge and lessons learned between accounts to increase effective business practices, adherence to industry standards, and common industry changes; including the following:

- Supporting HIPAA-standard transactions and HIPAA code sets for transaction processing
- Enforcing HIPAA security and privacy standards across the MMIS
- Incorporating ACA Section 1104 and Section 1561 transaction standards and operating rules
- Ability to support HL7 and Nationwide Health Information Network (NwHIN) standards in the larger healthcare ecosystem

Leverage Condition

This condition encourages the sharing and reuse of Medicaid technologies and systems—for example, multistate efforts, availability of reuse, identification of open source, cloud-based and commercial products, and transition and retirement of duplicative systems. The transfer of the base interChange MMIS, which was the first to be certified under the new CMS worksheets, is exactly what CMS had in mind with the Leverage Condition. Colorado and CMS do not need to pay for ground-up development but can immediately take advantage of the countless development and testing hours spent proving the operational effectiveness of the base system. Sharing is about applying documented, proven processes, and lessons learned from earlier MMIS

implementations. The subsequent projects are more efficient and avoid delay or failure. The Colorado interChange MMIS would directly benefit from the built-in configurability necessary for sharing across programs and states.

Multistate Efforts

The HP healthcare accounts worked together on the HP Medicaid Assistance Provider Incentive Repository (MAPIR) solution, which encourages collaboration between states on federal mandates. This innovative, shared solution won the 2012 National Governors Association (NGA) Public-Private partnership award for showing, according to Pennsylvania Gov. Tom Corbett, "how technology and innovation can help states achieve real cost containment and efficiency." This project involved collaboration between our accounts and 13 HP customers on a multistate, shared, vendor-agnostic solution to the federal mandate supporting the meaningful use of a health information exchange (HIE). This is a solution that each account discussed individually with its customer and then with CMS as a means to reduce the overall cost of compliance for the federal mandate.

Identification of Open Source, Cloud-Based, and Commercial Products

HP has selected HP Exstream as the correspondence management tool. This tool uses open APIs and will be deployed as a cloud-based, service-enabled offering. This method of delivery matches the CMS vision for efficient usage of advanced business packages in state healthcare.

Business Results Condition

This condition sets the goal of delivering 21st-century customer service with applicants, clients, plans, and providers through identified performance standards and testing. To achieve the desired business results, the technology must support the users' needs and simplify their work processes, not just merely replace manual processes without added benefits.

We have enhanced our interChange MMIS UI to enable customer and HP account staff members to enhance productivity significantly by simplifying tasks in the interChange MMIS. These enhanced features, known as interChange @neTouch, provide users maximum efficiency, exceptional productivity, and personalization. @neTouch features include user configuration settings, including Favorites, Search, Print Profiles, Help, and Access. Now, the information most critical to each user is available literally at the touch of the button.

Degree of Automation

The interChange MMIS is designed to support a high degree of automation. Every claim type, no matter how received, is processed as a transaction in real time. This allows us to use one claim engine for web, EDI, paper, or batch claims of every claim form. Eligibility file processing is transactional, allowing us to support batch, real time, or both in the same engine. For years we have been running claims and eligibility "as a service" using a common interface and process. We continue extending this perspective through the expansive use of workflow and rules.

Together, the workflow and rules engine support machine and human activities to standardize and automate many business processes.

Customer Service

The Colorado interChange MMIS solution provides accurate and timely processing adjudication of submitted transactions. To provide high quality customer service, HP goes beyond routine transaction processing and delivers flexible, 24 x 7 accessibility, and comprehensive self-service functions to Colorado Medicaid providers and clients. The following figure is from the HP Healthcare Portal, where providers can enroll, check client eligibility, handle claims, and receive a "Client Focus View" for the clients within their practice.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE DEPARTMENT AND HAS BEEN REDACTED

The HP Healthcare Portal offers program stakeholders a single, secure website for self-service functions, including the following examples:

- **Providers**—Claim submission and inquiry, eligibility inquiry, client health history, provider enrollment, prior authorization submission and inquiry, communication, and program information

- **Clients**—Benefit coverage, service and dollar limits, claim information, service authorizations, spend-down tracking, third-party coverage on file, and provider search capability

- **Managed care entities**—PMP Enrollment and Presumptive Eligibility

Performance Standards and Testing

Testing and performance standards share similar desired outcomes—the right business process achieved in the right amount of time to deliver the right results. HP's approach to planning through execution, across each test level, provides tight controls and proven processes to facilitate high-quality outcomes. Our repeatable, proven testing processes support system performance to meet the prescribed service-level agreements (SLAs) and key performance measures (KPMs) in daily operations of the new Colorado interChange. The HP Reporting inSight operational dashboards keep staff members informed of the KPIs at a glance. SLA and KPM monitoring is simplified.

Reporting Condition

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The Reporting Condition defines the generation of transaction data, performance information, and other reports through open interfaces to designated federal repositories or data hubs with the appropriate audit trail. The HP Reporting inSight Dashboard adds reporting clarity in two key ways. First is the presentation of the most requested operational statistics in a series of reporting dashboards. These provide easy interpretation using trend lines and color-coded gauges for at-a-glance understanding of the underlying operational condition. The following figure is an example of a program analytics dashboard that displays metrics and facilitates user interaction with the introduction of a third dimension of "time."

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE DEPARTMENT AND HAS BEEN REDACTED

As the user plays the "Time Slicer" at the bottom of the chart, the data on the graphs dynamically updates based on the values during the quarterly time periods. This ability turns the inSight Dashboard into a performance analytics tool.

Besides producing reports, the actual data that feeds the operational reports can be exported as CSV files for publication to a central repository, shared with trading partners, or imported into alternate reporting tools.

Accurate Data and Interfaces

HP's fully integrated MMIS links transactions—such as claims, adjustments, payments, receivables, cash receipts, recoupments, and voids—to related records in the database. The interChange MMIS provides prompt and accurate claims processing with system controls for accurate financial reporting and forecasting of budget expenditures. The interChange Connections solution simplifies data exchange and integration with external agencies' trading partners and programs.

Report Generation and Audit Trails

HP Reporting inSight reporting services allow users to take the actual data that generated the operational reports and exports it as CSV files. Users can transfer the data into the application of their choice to filter and refine. Users can publish this data through defined APIs to CMS data hubs or repositories. Predefined online performance reports enable system management, provider feedback, and effective operational oversight.

The Colorado interChange MMIS will track updates to data through batch, real-time external interfaces, or web panels. This provides a complete audit and reporting process. The audit trail records the action performed (insert, update or delete), date of the change, the source of the change (electronic file or staff ID making the change), and the information changed because of the update.

Interoperability Condition

The Interoperability Condition sets the vision of how the MMIS engages with the broader healthcare ecosystem in a defined and service-oriented manner. The interChange Connections EDI and ESB share standard transaction sets with trading partners through an integrated ESB, file-tracking system, and service monitoring framework. For example, the file-tracking system web application allows users to view file events that have been logged into the database. The authorized user can look at the processing of the file and see the path the file has taken through the system. The HP Help Desk staff can look at the file-tracking system to help determine the status of the files going to or coming from MMIS stakeholders. Although most states do not purge the file-tracking system information, the capability exists to configure the amount of retained information. Some configuration will occur to set up the file-tracking system; otherwise, it requires minimal customization.

Interactions with the Exchange

Our network monitoring and NIST-based security standards control authorization and authentication within a high-availability processing hub to control data sharing. These adaptable data sharing tools extend to systems supporting the evolving HIE and health insurance exchange (HIX) transaction standards.

Interaction with Other Entities

The Department can use interChange Connections as the backbone and traffic cop for exchanging data with other entities within the Colorado healthcare ecosystem. With its security, encryption, integration, and messaging capabilities, the interChange Connections module provides the foundation for interacting with other agencies. It is designed to serve as the middleware between multiple systems. As illustrated in the following figure, interChange Connections is the conduit that manages the technical and business services of the MMIS and the interoperability to the broader healthcare environment.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE DEPARTMENT AND HAS BEEN REDACTED

The interChange Connections handles file and transaction routing, pre- and post-process, translation, and connectivity supporting various data connections and transport protocols simplifying the integration effort with external entities. By allowing systems to interface with each other, HP's EDI/ESB standardizes communication protocols and works with trading partners as a transaction manager. By handling the complexity of numerous systems,

interChange Connections provides the configurability that enables the Department to interact with other agencies in the future.

Enterprise View Summary

HP's Colorado interChange MMIS will deliver an enterprise view to healthcare. The enabling technologies drive continual improvement and increased business process maturity throughout the life of the contract. The architecture components and solution within the 7SC framework provide the Department a road map of how the enterprise approach of interChange meets the needs of today and is adaptable for the challenges of tomorrow.

Response to Detailed Requirements

Our response has presented an overview of the technical architecture and how the solution addresses the CMS 7SC in this narrative overview because it is critical to have this complete picture of the foundation before individual details can effectively be discussed. By presenting the complete picture that builds the strong framework of the MMIS, we established that the interChange MMIS is flexible, adaptable, and scalable and will meet the Department's business demands of today and tomorrow. The following addresses the Department's specific architecture requirements.

interChange Enterprise Perspective (Unique ID 1321)

As described in the overview of this section the interChange MMIS is built for flexibility, adaptability and scalability. We understand that the business demands of tomorrow require the ability to be agile and quickly accommodate the business demands. That is precisely why the interChange Business Policy Administration rules engine was created. This business analyst configuration tool is at the heart of defining the transaction business rules while being flexible enough to adapt to changes in the program such as expanded populations or changes in the delivery model.

The BPA rules engine has proven itself to be expandable as our clients have implemented new programs, defined hierarchy business rules of funding source responsibility to maximize federal participation, and support our clients as the business model has shifted from fee-for-service to managed care or hybrid approaches.

Besides the power of the BPA component, the interChange MMIS has configuration enablement throughout the solution. The member and provider portals are configured in terms of the look, feel, and features. The interChange MMIS user interface empowers the MMIS business analysts to personalize the daily work experience to their specific jobs. The careful integration of working within the framework of the MMIS allows for future configuration as new business processes are identified as candidates for workflow management.

Finally, the interChange MMIS is supported by our healthcare private cloud that securely delivers service based infrastructure that can be scaled to meet the business demands of the state. This infrastructure approach supports many of our current interChange MMIS clients. From top

to bottom, the solution configuration capabilities are the right solution for Colorado today and tomorrow.

interChange Enterprise Perspective (Unique ID 1322, 1326)

Historically, MMIS architectures have had tighter integration that restricts the agility and extensibility of their capabilities to change as healthcare business needs evolve across time. Such historical architectures have not taken full advantage of COTS packages. Therefore, interoperability has been less prescriptive, leading to a jumbling of the overall architecture as depicted on the left side of the following figure.

The Colorado interChange MMIS, following the CMS 7SC and the MITA vision, best positions the Department for effective interoperability of healthcare programs during the entire life of the system. The streamlined, n-tiered architecture of the interChange MMIS makes adaptation across components easier to achieve.

RESPONSE HAS BEEN GRANTED CONFIDENTIAL TREATMENT BY THE DEPARTMENT AND HAS BEEN REDACTED

To best document our response to an enterprise view supporting the enabling technologies, we previously presented our response within the CMS 7SC framework. By taking this approach we clearly document how the interChange MMIS solution is aligned to state and nationally recognized Medicaid business processes and technologies.

CMS has identified the 7SC that systems must comply with to receive enhanced federal funding. The HP Colorado interChange MMIS solution can best meet these requirements and help the

Department communicate with CMS about the 7SC during project reviews. The proposed interChange MMIS provides the foundation enabling the Department to mature the Medicaid enterprise alongside CMS 7SC and MITA 3.0 principles. The principles of MITA are built into the DNA of the interChange MMIS. By having a service-based architecture that uses nationally recognized technologies, the interChange MMIS is the solution that can continually adapt across time and provide the most cost-effective, long-term solution available to the Department.

interChange Component Integration (Unique ID 1327)

Protection of Medicaid data is of utmost importance to every state. The need to secure data comes with the challenge of allowing convenient access as needed to those users authorized to view or edit the data. interChange Security is the value-added solution from HP to verify that access is granted correctly and promptly for each user to each program or application needed.

interChange Security Defined

We deliver a comprehensive security solution that provides centralized identity management. It incorporates a single point of access for authorized system users. Centralized user authentication, authorization, and de-provisioning a terminated user are accomplished with a set of interoperable tools.

Historically, users were burdened with separate user names and passwords for disparate systems based on their job duties and level of responsibility. Provisioning those names and passwords could take days and required separate forms for separate functions. Our solution uses Active Directory Federation Services to achieve the following:

- Single sign-on and authentication
- Self-service provisioning
- Delegation
- Role
- Management and help desk
- Password management
- Hierarchal structure

Instead of having an assortment of forms for requests, we create a consistent method for requesting access to applications and network resources. The solution manages user access through automating the request and approval that replaces the existing manual and paper-driven processes.

How interChange Security Will Benefit the Department

The Department will see gains in worker time and efficiency with single sign-on. Authorized system users will log on to their workstations and automatically access the applications they have been authorized to use through the landing page.

Our state employees in Kentucky estimated gains of two minutes per day per worker, which does not sound impressive at first. Multiplied by 2,785 workers

for 252 working days per year, though, they achieved savings of 1,403,640 minutes annually. This is just in log on alone. Further savings were seen in reduced help desk staff, lower paper costs by eliminating forms, and reduced down-time for staff waiting for password resets.

The most important benefit of single sign-on is, of course, security. We provision a single user ID, and can easily assign and track the correct roles and permissions for that ID. Users are more likely to remember (and keep secure) one password instead of several.

HP will bring these same results to the COMMIT project as interChange Security delivers significant return on investment to the Department. The security foundation brings system access to the forefront of technological advances.

How It Works

HP will configure security around the Department's Active Directory.

Single Sign-On and Authentication

The solution provides single sign-on for MMIS users to access integrated enterprise applications by Microsoft Active Directory Federation Services. Authenticated credentials and roles are passed through standard SAML tokens to the receiving application for use as application-specific authorizations. MMIS users can access applications through links on the landing page. This is the starting point for Medicaid activities through the web. Each activity that traverses the landing page is logged and reportable. Direct access to individual applications using "deep links" is handled by routing users back through the logon page before initial application access.

User Self-Provisioning

The solution allows for user self-provisioning. Based on user type, accounts can be created through access to a webpage, an internal link, or PIN information sent through the mail with a provider ID. Providers are automatically given the appropriate authorizations based on their enrollment information. Internal fiscal agent or state staff users can request access to the needed MMIS applications. Requests are routed through preconfigured workflows of approvers who approve or deny the requests for authorizations. The authorization request process is managed using emails sent to the series of approvers. Status emails also are sent to everyone involved with the request.

Delegation

Providers can allow administrative office staff members or contracted billing agents to access MMIS functions for them while maintaining a separate set of authentication, authorization, and security audit information. Each administrative staff member and contracted billing agent will have a separate logon ID. Through interChange Security, providers can delegate selected authorizations to accounts based on the owner's roles within the business processes. Those links are maintained, even across providers, while having an individual identity for each delegated user.

Role Management and Help Desk

The solution provides a help desk application to manage each aspect of configuration: users, applications, and roles with corresponding reporting features for each. The help desk is the central control center for daily operations. Call center staff members will be given basic access to the help desk (not administrative access) to manage user calls related to typical security issues.

Password Management

The solution allows for self-service password resets. If a user forgets the password, a link is on the security logon page to reset it. This link results in a system-generated email to the user's registered email address that contains a link that will take the user to a page that will ask a preconfigured security question. The user must answer successfully to reset their password.

Hierarchal Structure

State and fiscal agent staff member user IDs are grouped based on organizations and departments. Many organizations can be defined within the solution. Each organization must have at least one department. Each internal user is assigned to one organization and one department. These assigned groups are the basis for the authorization approval workflows that are processed when an authorization request is initiated by a user. Owners of these groups can be given the authority to manage configuration of the group, add users to the group, and terminate users in the group.

User Provisioning

Exceeding the basic security management requirements, the interChange Security solution includes workflow user provisioning that allows efficient access and assignment of roles to users within the solution. User provisioning and management is a critical part of the security process. The process should have controls and workflow to allow for the detailed user management necessary to verify users have the proper controls in place for system access. This means users do not have to wait days for access and can get the information they need timely. The emphasis is placed on policy and policy monitoring, not the work to accomplish it. This component of the solution allows for quick user auditing and review of user management and access.

The following figure illustrates a user requesting security access to specific applications within specific environments.

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DEPARTMENT AND HAS BEEN REDACTED

Security requests are routed through preconfigured workflows of approvers who approve or deny the requests for authorizations. As the following figure details, the authorization request process is managed using emails sent to the series of approvers. Status emails are sent to everyone involved with the request.

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The following figure shows the screen that a manager will use to grant authorization to the security request. Security requests are managed through this online controlled set of defined

workflows, which provides the oversight and efficiency required of an enterprise-wide MMIS offering.

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Because the security provisioning is worked and tracked electronically, audit reports of the applications that users may access are simple to generate. While other vendors attempt to track such information on manual tallies or through spreadsheets, our solution provides an auditing report ability linked directly to the actions taken through the provisioning system.

Status Reports and Processing Statistics

HP provides an extensive status and reporting dashboard analytic utility through our inSight Dashboard solution. The dashboard is powered by the Microsoft Business Intelligence (BI) product suite. These tools use in-memory storage capabilities that plug into Microsoft Excel. This provides a program analyst with a powerful ad hoc reporting tool to pull data from the MMIS Ad Hoc Data Repository into memory for graphical display and drill-down. This can be evident from the following figure, where this technology is employed to display an SLA dashboard on call center statistics.

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This type of dashboard is simple to create and deploy, because most program analysts are familiar with Excel. The deployment is to SharePoint, which is the main HP content management technology we are proposing for the Department. Besides easy accessibility, the visual appearance in Microsoft Excel can retain its visual properties in Microsoft PowerPoint.

The following figure provides a claims processing statistics example. In the example, the dynamic filters are at the top of the dashboard. Users can drill into the data using these filters to get the particular view of the data they need:

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As the filters are modified, the graphs change on the fly representing the data subsets as defined by the filter selection. Within the previous example, the ability to display two graphs is illustrated with the first line graph documenting the claim counts by form type, while the second chart displays the stacked chart of claims by their adjudicated status. The visual and interactive nature of the program management analytics provides a real advantage to the managers, who can obtain direct and immediate results to their questions.

interChange Flexibility and BIDM interface (Unique ID 1328)

The open interChange MMIS has a distinct advantage compared to the more rigid commercial healthcare packages that some vendors are attempting to force-fit into the Medicaid market. Where those systems lack the flexibility to create new tables because of being locked into a force-fit data model, the interChange MMIS and our established change management procedures enable the adaptability to create new tables and fields with the ability to report on the data within the tables by updating the data extracts from the MMIS to the BIDM application. The transmission of the updated MMIS to BIDM extract will be managed by the interChange Connections component that controls the interoperability of the solution.

interChange Data Retention (Unique ID 1329)

The interChange MMIS meets this requirement by providing online access to more than six years of historical data through the MMIS online system. While some rigid MMIS solutions must rely on archiving of data to maintain performance, the interChange MMIS is more advanced. We will work with the Department for this requirement and explain how we will retain online access to the historical data to the benefit of the business users. This helps online MMIS research business tasks and the breadth of MMIS reporting that is available from the interChange reporting environment.

interChange Architecture Documentation (Unique ID 1330)

To unify the communication of the enterprise wide architecture of the interChange MMIS offering, we make use of the Enterprise Architect modeling tool. This tool acts as a central repository linking together the various aspects of the architecture documentation to provide a cohesive understanding of how the parts fit together.

Enterprise Architecture is a COTS based, modern tool for organizing the multiple dimensions of the architecture so that they make sense and that the team can easily navigate to the portions of the architectural documentation they are interested in researching.

Current Documentation (Unique ID 1015)

Documentation Maintenance

As part of our DDI and operational processes and procedures, we have established practices to update the documentation related to the solution. The documentation is maintained on-line for both easy updates as well as centralized coordination of the documentation version control. This way any reviewer of the documentation knows they are looking at the most recent copy of the documentation. The documentation updates are comprised of the following items:

- Database Schema
- Data Dictionary
- Entity Relationship Diagrams
- System Architecture Diagrams
- Configuration Diagrams
- Network Diagrams
- Interface Standards
- System Object Documentation

One aspect that sets the HP documentation practices above the other vendors in the MMIS market is our ability to link system objects to the business requirements as well as the test cases that validate the functional capability is working as defined. Within interChange, a system object is a unit of documentation describing a screen, report, process or component of the MMIS. HP pioneered the traceability of the system objects to the requirements and test cases.

This industry best-practice is a significant reason that HP has been able to successfully implement more advanced MMIS solutions in the past decade than all other MMIS vendors combined.

Adhere to the Deliverable Schedule

Three aspects of our procedures drive us to meeting the schedule of documentation updates. The first aspect is the fact we start with a working, CMS certified MMIS offering at the start of the COMMIT project. A working system and the detailed system object documentation as a starting point provides a significant advantage to the success of the DDI. The second aspect of meeting the deliverable schedule is our detailed project schedule which clearly identifies the deliverables and their associated due dates. For each of these deliverables, the subtasks required to generate the deliverable are included in the schedule with the identified resources responsible for generating the documentation.

The final aspect of the meeting deliverable schedules is the best-practice release procedures we establish during the operational phase of the project. As part of a release, the documentation is updated and coordinated with the release just as any other change that is being promoted.

7.18 – Enterprise Architecture Requirements	In Production? YES/NO
Description Addresses Requirements (Provide the range as applicable): 1323-1326, 1331-1333	NO

interChange Service Architecture and Adaptability (Unique ID 1323)

The interChange MMIS can quickly and easily invoke a service locally or remotely. HP designed the interChange MMIS to permit control over how services are exposed, securing them at the services level through the Microsoft BizTalk ESB as part of the interChange Connections module. The following figure shows how services are called locally by users and remotely by external systems.

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The Microsoft BizTalk ESB orchestrates the messaging between users and the services being requested. Using defined services and the ESB, future features can be added without requiring pervasive or broad changes to the core system. The ESB provides the layer of abstraction that helps facilitate effective change.

The following figure provides an overview of the interChange business services and how they are organized to have distinct, clearly defined end points.

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The figure provides two examples from the MMIS. The service trigger event is on the left-hand side with the service result on the right side. The service is defined by the contract, business logic, and data transported with the service. This presentation of the MMIS services aligns to the CMS technical architecture description.

Enterprise Application Integration and Web Services (Unique ID 1324)

HP interChange Connections is a flexible message-oriented, middleware framework for managing IT assets in a service-oriented approach. interChange Connections delivers the application integration and web service management required.

The following figure shows an overview of the interChange MMIS architecture, functional layers, component modules, and relationships. The top layer shows the stakeholders that use the interChange MMIS and the access channels used to connect through interChange Business Services Framework.

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The figure shows how our design exposes custom and COTS components to system stakeholders. The first layer shows the stakeholder community, which may include other State agencies. Services are exposed to the stakeholders through the access channels shown in the second layer of the figure. The third layer contains interChange Connections, which orchestrates the service calls and messages with the application components shown in the fourth layer. This layer comprises the business services. Because these component services are modular, they can be upgraded or replaced with minimal impact to the overall MMIS solution.

The following table summarizes the features of the interChange Connections module.

interChange Connections Features

Feature	Description
Communication Adapters	Integrating systems starts with the ability to connect and exchange messages through a common protocol. interChange Connections has more than 100 communication adapters available to quickly link to new trading partners and begin transferring data. Common adapters such as HTTPS, JMS, and secure FTP are available to support synchronous and asynchronous processing of the Department's transactions. Support for these and other protocols verify that communication with the trading partners can be established quickly.
Security	Security is crucial to enterprises exchanging private information, and this is especially true for an MMIS. interChange Connections uses two basic types of security when exchanging messages. Messages can be encrypted using an agreed-on public key or digitally signed using a private key certificate. These two methods are industry standards for protecting a state's data.
Routing and Orchestration	The interChange Connections ESB handles simple and complex service processing. In some cases, the messages will simply be transported to a single service. Other times, it will be necessary to guide the transaction through many services and dynamically determine the path based on the data submitted and the business rules associated with that data. interChange Connections simplifies the implementation of complex orchestrations. Most importantly, it verifies delivery of messages using a publish or subscribe architecture.
Trading Partner Management	Working with external trading partners is an important part of providing a good experience for providers and keeping the system running smoothly. Trading partners will work with HP staff members to register for and test each transaction format they wish to be certified. After testing is complete, the Trading Partner Management function of interChange Connections will store the trading partner contact information and the HIPAA transactions the partner can send and receive. This verifies that interChange Connections can properly receive and track information from registered trading partners. It also facilitates ongoing communication and testing with trading partners as transactions are added or modified.

Feature	Description
HIPAA Compliance Checking	An important aspect of EDI is verifying that incoming and outgoing X12 transactions meet the HIPAA standards. interChange Connections will validate X12 transactions for HIPAA compliance as they are received and before they are sent to our trading partners. Edifecs XEngine is used to check HIPAA compliance of transactions sent from Medicaid trading partners. It also validates to "WEDI SNIP Level 7" to verify transaction data meets the requirements to be processed through the MMIS. Edifecs XEngine is part of the EDI interChange Connections architecture.
Message Translation	Another key component for systems integration is the ability to translate a message into a format that is understandable to the service that will receive it. Whether an X12 transaction or a non-HIPAA transaction, interChange Connections uses a visual point-and-click mapping tool to translate and transform messages into the appropriate format for the system receiving them.
File and Message Tracking	File Transfer Service (FTS) monitors, tracks, logs, and moves files throughout the interChange solution. FTS provides a complete file audit trail with real time, processing stage updates through the file-tracking web interface. FTS includes detailed error notifications, which allow quick response to failed files.
Command Console and BAM	One of the key factors in business success in the right information at the right time, which is where the Business Activity Monitor (BAM) plays a vital role. BAM allows business users to monitor and analyze data from defined business process sources. By using BAM, users can get information about business states and trends in real time.

interChange Open Architecture and Scalability (Unique ID 1325)

Based on our experience, we realize that the many stakeholders that deal with the MMIS are at various levels of technology sophistication. Our proposed solution takes a common sense approach of providing the right technology for the right business value at the right time. This approach has been proven successful in real-life through multiple MMIS implementations and subsequent operational support.

The details of our approach include using the interChange Connections capabilities, using secure FTP (SFTP) and the Colorado interChange MMIS SOA as a key MMIS interface solution. We understand not every entity is ready for SOA integration. Our solution has a suite of interfaces that meets the various needs of stakeholders in many states. The integrated architecture made possible through SOA is responsive, resilient, and reliable. The Department gains better

visibility into enterprise information and quickly adapts applications to changing business processes. The reusable assets, standard processes, and extensive national and global experience brought by HP's approach to SOA will deliver the improved accessibility and flexibility.

The SOA design also reduces operational maintenance costs by simplifying the process of making changes by having a single service applicable to multiple business processes. For example, a single service can facilitate a response from the automated voice response system (AVRS) while enabling the same type of responses through the self-service provider web portal. Using the proposed interChange MMIS architecture, the Department can respond faster to regulatory, programmatic, and technology changes because the SOA are adaptable and extensible.

The core of the interChange Connections is an ESB that allows for inbound and outbound interface management. Our offering, interChange Connections, is enabled through the BizTalk ESB. This SOA ESB supports services such as information management and web portal interfaces. ESB is an architectural construct and is a core feature of middleware technology. The ESB provides the capability to expose business application functions as reusable assets within an offering.

HP interChange Services

interChange is HP's HIPAA-compliant system based on a three-tier architecture that separates external (Internet) communication, application, and data layers. Reliability and performance are the foundation of the interChange clustered infrastructure: built to deliver high-availability, fault-tolerant, and highly secured EDI services. The architecture is flexible, scalable, and allows for rapid document turnaround. It can quickly integrate, manage, and automate dynamic business processes by exchanging business documents among applications, within or across organizational boundaries. The interChange solution is extensible, so that additional services can be transparently integrated.

interChange uses Edifecs COTS software for the data file format validation. interChange has successfully made use of this method of data verification and quality reporting of the inbound file structures. The Edifecs XEngine Server is one of the most widely used run-time engines for validating and converting legacy file formats, such as EDI, HL7, HIPAA X12, and flat files, to and from XML. Additionally, the Edifecs SpecBuilder is used for managing business-to-business (B2B) document specifications.

Features of the interChange Connections solution include the following:

- Batch and interactive routing
- HIPAA compliance service

    - Certified quarterly for edit types 1-7 for ASC X12N transaction and code sets
    - Claim-level and document-level rejections
    - Uniform submission response reports

- – Ability to set edits to a warning status
- – Code set validation can be set by transaction type or version
- – Monthly code set updates
- – Privacy and security compliant
- – Duplicate claim checking

- Data mapping or translation: any-to-any, one-to-many, and many-to-many:

  - – ASC X12, XML, and proprietary formats

- Support for multiple environments
- Capacity planning
- Performance analysis and system tuning
- Redundant network
- Message routing, security, and tracking
- Transaction audit tracking reports

While interChange Connections is the primary means of data receipt, validation, and processing, the overall MMIS provides many diverse data receipt access channels:

- interChange Connections for EDI
- AVR
- Direct submission (SFTP)

interChange Enterprise Perspective (Unique ID 1326)

The Colorado interChange MMIS, following the CMS 7SC and the MITA vision, best positions the Department for effective interoperability of healthcare programs during the entire life of the system. The streamlined, n-tiered architecture of the interChange MMIS makes adaptation across components easier to achieve.

To best document our response to an enterprise view supporting the enabling technologies, we previously presented our response within the CMS 7SC framework. By taking this approach, we clearly document how the interChange MMIS solution is aligned to state and nationally recognized Medicaid business processes and technologies.

CMS has identified the 7SC that systems must comply with to receive enhanced federal funding. The HP Colorado interChange MMIS solution can best meet these requirements and help the Department communicate with CMS about the 7SC during project reviews. The proposed interChange MMIS provides the foundation enabling the Department to mature the Medicaid enterprise alongside CMS 7SC and MITA 3.0 principles. The principles of MITA are built into the DNA of the interChange MMIS. By having a service-based architecture that uses nationally recognized technologies, the interChange MMIS is the solution that can continually adapt across time and provide the most cost-effective, long-term solution available to the Department.

interChange One-Stop Data Access (Unique IDs 1331, 1332)

As we detailed in our response to Unique ID 1327, interChange Security is a complete single log on and user provisioning solution that provides one-stop, centralized access to the data within the MMIS, case management, BIDM, and PBMS (given its capability to integrate with the single-log on solution). We will take advantage of our five years of experience with single log on in multiple states to bring that success to Colorado so that the information from provider relationships, eligibility, enrollment, prior authorization, client, and encounter data flow through the single landing site for the integrated security.

interChange Mobile Access (Unique ID 1333)

Because the HP Provider and Client Healthcare Portal is web-based, it is accessible through a mobile tablet. Just as they would access the portal from their office or home desktop, the authorized users can access the secure portals through a mobile tablet today.

Besides accessing the existing portal through a tablet, HP will deliver a client-focused mobile application that extends the reach of the MMIS by providing access to key business features such as provider search, benefit eligibility, and other insurance lookup. This app would be applicable for delivering key information directly to smart phones.