

What do members of the HIT Council want to see in the Bay State / Zato demo?	Demo	Zato Responses
FUNCTIONAL REQUIREMENTS		
1. Overarching Capabilities		
1.1 That the technology has been successfully deployed in a healthcare setting	✓	This will be demonstrated at Baystate.
1.2 How the technology works	✓	This will be demonstrated at Baystate, and we will respond with answers to any questions about how it works.
2. Data Source Interface		
2.1 How does Zato create the ability to access data, create and manage on-going contact with each database to retrieve data at will?		Via data extraction and in some cases API. Zato staff and Zato technology have over 15 years of experience accessing and updating scores of databases to support applications. These capabilities are flexible to retrieve data securely and unobtrusively at will under various application site preferences, including direct access to production databases and access to continuously updated copies of the production databases, at the preference of the particular customer.
2.2 What are the specs for data interfaces/connections to data sources, what is involved?		That answer is two-fold. We have published JAVA APIs for direct real-time interfaces/connections with other systems. For interfaces /connections to data sources that are created and maintained by other systems, we have format converters that normalize data sets from popular commercial applications and database vendors. With data sources created and maintained by EHR vendors, the data extraction and normalization process requires some up-front work with the particular site implementation, since each implementation is different. Our team has interfaced and connected to different inpatient and outpatient EHR data sources in Connecticut (Siemens and NextGen) with minimal effort, and to a very large Cerner data source at Baystate. Members of our team have also interfaced and connected to Epic systems and have working knowledge of GE Centricity, Allscripts, and McKesson. The technique is the same with and extensible to other EHR and legacy data sources. The capability enables global processing across different data sources of different EHRs and other

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		applications, whether the data are in a single data center or multiple decentralized data sources.
2.3 What is the mapping effort involved aggregating across systems? Across corporate entities?		The 'mapping effort' leverages techniques that have been well proven and validated at massive scale across hundreds of data sources at the same time from multiple systems and corporate entities. Medical terms, codes, field names, metadata tags, extracted concepts from text, and data formats in data cells are normalized and indexed. Multiple indexes to multiple data sources can be processed simultaneously across edge servers using techniques for cooperative federation, which extends distributing computing across compute clusters in a single data center to a peer-to-peer process across compute clusters located in multiple data centers across multiple networks.
3. Data Retrieval & Aggregation Capabilities		
3.1 Data retrieval and aggregation across clinical systems and platforms; what data is being aggregated and what are the data sources?		Any and all structured and unstructured alphanumeric data from databases, free text, application data stores, including EHR repositories can be virtually aggregated and retrieved across edge servers within a data center or across data centers.
3.2 Data accuracy		An extensive set of operators enables Boolean and range operators across discrete data and probabilistic ranked results across full text data sources.
3.3 How much human interaction is needed for the process of data aggregation		
3.4 Explanation of how Zato handles missing data when assembling QI scores.		

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3.5 Unstructured data retrieval, accuracy, and accuracy of NLP		Accuracy of underlying text retrieval engines can be confirmed by Web search and government performance evaluations. Accuracy of NLP can be viewed in the demonstration and derives from the inventor's enhancements of the previous invention. Dr. Heinze invented the NLP in LifeCode, which is at the core of the UnitedHealth Optum suite for Computer Assisted Coding and Clinical Documentation Improvement. Dr. Heinze has subsequently invented an enhanced NLP capability with enhanced accuracy. A Google search of LifeCode on the Optum Web site would provide testimonials regarding the LifeCode system.
3.6 How does Zato handle encounters at "alternative" sites such as getting a flu vaccine at a CVS pharmacy?		
3.7 Does Zato have access to pharmacy prescription data m(i.e. CVS, Walgreens, etc.) to factor in patient "compliance" (i.e.: medication possession ratio) in quality reports?		
3.8 How the technology reaches in, tags data, brings it into a user interface - quickly, accurately	✓	This will be demonstrated at Baystate.
3.9 How are alerts of updates/changes to tagged data handled?		Flexibly at the preference of the customer site. Typically with incremental indexing of data additions, modifications, and deletions.
3.10 How does the data extraction, tagging, reporting deal with duplication of patients?		Assuming the question is about duplication of patient records, the specific approaches vary depending on whether the duplications are exact or not and whether they are within the table space of a single database management system or across application repositories. We have used a number of techniques.
3.11 How is the site of service information collected and how is it being categorized and cataloged in the system?		Question not understood

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3.12 Demonstrate Zato's capability to access and then parse all quality data by race, ethnicity and language preference. Also, using Zato's technology in what proportion of records can Zato's technology identify REL (50%, 99%, etc.)?		
3.13 Taxonomy is important and not just the listing but how the system collapses this information for data aggregation and collection.		We use a comprehensive ontology, extracting medical concepts with qualifier values for the medical concepts such as certainty, status change, severity, laterality, history, temporality, etc., as well as the confidence level for that extraction. Extracted medical concepts from the ontology include the human anatomy, diseases, symptoms, observations, medical tests, findings, diagnoses, treatments, procedures, morphological abnormalities.
3.14 How complex are the data sets, underlying data currently being used?		The data sets to be demonstrated are typical of the data sets collected and maintained in EHR system repositories.
3.15 Where/how are indexes stored?		Indexes are stored in and by the file system.
3.16 What does the UI look like?	✓	Example UIs to be demonstrated
3.17 How are the ICD codes aggregated up and down tied to HCPCS codes?		We have the cross-walk to pair off the CPT codes to the ICD codes. Our experience has been mainly with primary/urgent/emergency coding. We have developed an NCCI rule engine for applying the cross-walk. We are obtaining updated ICD/CPT data sets and will be conducting updated testing of the rule engine.
3.18 What are the Bay State algorithms tuned to do? What effort would be involved to develop the algorithms for SIM?		The clinical data are extracted and normalized for flexible use with any applications. The initial applications of greatest interest to Baystate are for DRG grouping of patients in the DRG Dashboard Application and for improving the quality of clinical documentation in the CDI Application. Of note is that the same NLP, extraction, recognition, coding, and normalized indexing of clinical data sources is used for DRG, CDI, calculating CQMs, and other applications.
3.19 What is the architecture? Is data taken directly out of the clinical system or is there a repository involved. Where does the indexing occur?		It is optional to take the data directly out of the clinical system or use a repository (duplicate database, data warehouse, or whatever) at the preference of the customer site.

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3.20 Demonstration of "data normalization" routine: Show how they normalize data and metrics when reference values are different from different labs or use different units (mg/dl vs. mmol/dl, etc.) across different patients and also within the same patient seeing at different locations or different ehr.		
3.21 Demonstration of data extraction from sites other than Bay State hospital when patients are seeing in different locations (i.e.: satellite clinics working with Bay State.)		
3.22 How are patient interactions captured?		
4. Reporting Capabilities		
4.1 Report samples developed from the tool - end products, reports, dashboards, etc.	✓	To be demonstrated
4.2 Demonstrate provider reports (individual, by group and by site).		
4.3 Show reports of QI metrics comparing one provider against peers or against self during previous reporting cycles.		
4.4 Production of computed measures; quality measures; is there a list of measures currently reported on and what is the criteria/specs for those measures? Using NCQF measures?	✓	We have focused to this point in improving the quality of clinical data. We are now composing processes to use the same processed data results to calculate and output measures by patients to e-CQM specifications. We will show the results to date on your visit.
4.5 Report generator - how much coding is required to customize or build new reports?		No coding (programming) is required to build or customize new reports. We use the results of our NLP, recognition, extraction, coding, and indexing processes to generate reports using high level queries, which include built I aggregation functionality. Users simply pick these saved queries from a library for the CDI for

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		a list of items like Sepsis. The same approach will apply to generating a report from a library of prewritten CQM queries.
4.6 Demonstration of how diagnostic and QI parameters may be customized (should SIM need to change parameters currently used by ehr or payers or health systems).		
4.7 If there is no database, what is the process for storing results of queries and verifying reports?		All results are hyperlinked back to the source clinical data for ease of verification. Results can be easily output to and stored in a database. We interface easily with popular DBMS systems.
4.8 The use of the output: How and what is it used for at Baystate?		
4.9 Proof of concept; someone is using and relying on the reports/data.		Not sure of the question being asked.
4.10 What is Zato's process and capacity to improve or expand capabilities or functions over time to address gaps in data/evidence/care? Especially in light of the new Precision Medicine initiative and more work on pragmatic clinical trials.		
4.11 Are the current capabilities to track pro-active behaviors by the clinicians and their results or follow on actions?		
4.12 Is there a Zato data dictionary and guide to the tools capabilities that can be shared?		
4.13 What types of audit trail/reporting is the tool capable of providing and what would be available to users?		
4.14 Will ad hoc reporting be available?		

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5. Quality Measurement		
5.1 Functionality that aligns with the functionality needed to compute/report eQMs		The functionality in the software is aligned with the functionality to compute/report eQMs. The software already does the required processing. The additional work is on the query generation side to create the library for the 64 e-CQMs of interest to you.
5.2 What data elements and variables are they working with (e.g. race, ethnicity, co-morbidities, pediatric, behavioral health)?		Typical demographic data, Complications or Comorbidities (CCs), Major Complications or Comorbidities (MCCs), age qualifiers. The medical ontology is applicable to human anatomy and physical conditions. Existing tools would be useful for analysis of behavioral health, and more useful if the medical ontology is expanded to represent behavioral health.
5.3 Level of stratification of computed measures (e.g. by health disparities factors)		Regarding the calculation, as we create a library of CQM queries, the e-Clinical Quality Measures are computed according to the CMS/NQF specifications. Results of calculations for individuals who comprise particular populations can be sorted and grouped by health disparity measures. Because eQMs are nearly all process measures, there is no specified stratification involved in the calculation. To the extent that a payer establishes an approach to stratifying quality/outcomes measures according to health disparities, the aggregation engine used to calculate measures is flexible to take into account such an approach.
5.4 Demonstrate how Zato calculates and reports gaps in care for specific conditions.		
5.5 Explain how Zato calculates or estimates likelihood of a diagnosis, "gap in care" or any other output. What are the uncertainty thresholds they use to include or exclude a diagnosis or a parameter in the metric. What guidelines or other source of "best practices" does Zato use to measure provider quality (unless this is determined by customer rather than Zato)		

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5.6 How they are pulling or capturing the information for analysis and how the report functionality works and the query in general- how real time information is incorporated into previous reports and how the system is filtering information so there is consistency and commonality of information/data that is fed through to reports.		We are creating views of data in their respective collection and storage systems so that the data are consistent. Indexes are updated with changes to the source data repositories. There is an integrated continuous monitoring and filtering capability with flexible routing and notification.
5.7 Explain how Zato uses ehr entry dates to separate most recent parameters (i.e.: latest blood pressure reading, most recent HbA1c results, most recent drug choice or dose, etc.) from earlier results. Alternatively if Zato uses rules like multiple results and then averages them, please explain what system they use.		
5.8 How reports that are being created over time are changing or being updated - is there consistency in report generation by timing (monthly pull etc.).		Yes, using the frequency preference of the site.
5.9 Who gets the reports? For SIM will the reports be subject to FOIA?		This is dictated by the customer and managed by security components including encryption options.
5.10 Demonstrate an algorithm for measuring outcomes, e.g. for diabetes or HBP	✓	We are formulating CQM queries now to show you for diabetes and HBP
5.11 Has Zato even done a validation study of its data mining and QI metric assembly system vs. a manual review? If yes, can Zato provide concordance/discordance results of such comparisons? Are reports published in peer reviewed journals?		
5.12 For comparison purposes what risk adjustment methodology(ies) is Zato using or contemplating to		

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"normalize" risk profiles across different provider panels?		
5.13 Show the integration of claims and clinical data		
5.14 What is the vision for secondary uses of the data?		
5.15 Will data be permitted for secondary uses in research?		
5.16 What type of processes would need to be created to address secondary uses of the data?		
NON-FUNCTIONAL REQUIREMENTS		
6. Data Security		
6.1 What are the roles of the data source operator vs. Zato/data aggregator, esp. in terms of access and maintenance to UI, security, technical operations?		We adopt and conform to the access control restrictions of the site
6.2 The data security model; how do they deal with obtaining authority to get access to the data, e.g. IRB, patient consent? Who has access to the data?		This is flexible and subject to site policy. Access to the software employs role based discretionary access control for each username with strong password enforcement. All transmission are encrypted end-to-end. Data can be optionally encrypted at rest. Reports are protected by policy.
6.3 Have any privacy or security breaches occurred?		No
6.4 How will access to PHI data be protected?		
6.5 Will data be allowed to be printed, stored locally? If so, what permissions and permitted uses will the data have in this state?		
7. Operations		

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<p>7.1 What is Zato doing with Bay State - does the scope, scale, # of clinical systems/platforms, # of patient records, who are the end users align with what CT SIM would need to do? What is the end-to-end use case?</p>		<p>The initial interest at Baystate started with DRG grouping/monitoring/intervention opportunity. This quickly spread to DCI. Last week, the CEO and President of Baystate announced that Baystate is moving rapidly to 80% performance based revenues. He announced that CMS just selected Baystate for a ACO 33 program. These factors suggest that CQMs may be the next interest. There are neither additional processing steps nor additional license fees to add a CQM Application using CQM libraries – only the creation of the CQM queries, which are reusable and updatable and freely distributed to all licensees of the Zato Health Interoperability Platform software.</p>
<p>7.2 Context as to why Baystate engaged Zato and their objective for leveraging Zato technology</p>		
<p>7.3 Bay State staff- testing for accuracy - process, effort, what are they doing with the data?</p>		<p>Presently assessing DRG and CDI results</p>
<p>7.4 What are the costs and requirements of the data owner at the source? Who pays for the servers, NLP tuning, mapping, maintenance?</p>		<p>Servers are already in place for their data. The cost of index servers (edge servers) for the Zato Health software indexing and processing are the responsibility of the site. Hosted services are optional. Initial mapping is part of the initial deployment cost. Maintenance and NLP tuning are provided under the license.</p>
<p>7.5 Talk to Bay State staff -- level of effort involved for reporting to get up and running (e.g. IT staff, cost, challenges, security)</p>		<p>We recommend allowing 60 calendar days for initial data extraction. If our data extraction team manages the data extraction process, the local level of effort is reduced to low levels of access setup, guidance, and support as requested. For examples, the target level of effort for Baystate IT resources for the system that you will see demonstrated was estimated at the outset at 12 hours total. We have not been advised that project needs for Baystate IT staff significantly exceeded that estimate. Where the initial data extraction effort is managed primarily by internal site staff, one level of effort by internal staff at one site was reported to be at not less than 50 hours, including data from one different inpatient EHR (LCR) and one different outpatient EHR (NextGen).</p>

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7.6 Who does the data extraction and who does the analysis?		The data extraction is automated with some initial set up time required by Zato or trained local resources. The analysis is automated. The users of the interactive analysis range from physicians to coders to report generators. Output can also be sent to other tools for different types of analysis.
7.7 How is the information being translated into something actionable i.e., what are they doing with it?		DRG Dashboard Application, CDI Application, and with the creation of a set of CQM queries, the CQM application
7.8 How are they validating the accuracy of the product? What is their quality control process?		Validation of software results is by automatic hyperlinking of results to the supporting evidence in the source medical records, with automatic highlighting that uses offsets to the appropriate sections of the medical records. We use internal QA staff for software performance QA.
7.9 How are the providers using this information and what do they think of the accuracy of the information?	✓	The reaction to live demonstrations of clinical quality improvement have been very positive. We will try to arrange for you to get direct feedback during your visit
7.10 What is the time required to setup the software?		Minimum, of 30 days for the initial data mapping. 3-6 month pilot recommended to include side-by-side results and evaluation
7.11 What are the hardware, software or other requirements to use the software?		We prefer Linux. We recommend IBM Power Linux, since IBM ships our software as an appliance. We support all of the popular Intel X86 platforms as well.
8. Customization & Requirements for SIM Pilot		
8.1 What is the level of customization that would be required to fulfill CT SIM requirements versus the Bay State requirements? How replicable is the solution to handle SIM requirements?		The requirements should be similar for providers participating in the SIM initiative, although the application for SIM would focus on CQMs with options for CDI, DRG Dashboard, etc. if desirable
8.2 What is the time requirement for participation in the pilot?		3 months minimum. 6 months recommended with an evaluation mechanism and period

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8.3 Will there be a cost to the payer for participating?		Yes. A pilot does involve initial time. A fixed fee for the pilot covers at least some of our time. The cost for the labor effort for the initial set up and configuration of the software for a hospital provider with a single EHR system would not be expected to be less than \$40,000, not including expenses. The typical \$40,000 pilot license fee would be waived because it is covered under the terms of an existing state license with DSS. All pilot implementations are reusable and transition to operational systems.
8.4 What data is needed by the payer for the pilot?		Access to operational data – directly or to a copy of the data.
8.5 What is the value to the payer for using the Zato technology?		If the payer is the SIM grant, the value is the demonstration using provider data of innovative capabilities to improve standardized quality measures affordably and to improve cost effectiveness of care, with reusability for other Connecticut providers
8.6 Is the data only available for one patient/record at a time?		Analyses span multiple records of the same or multiple patients
8.7 Is there any opportunity to review multiple patients/records at once?		Yes
8.8 Is historical data for a patient/record also available?		Yes
8.9 Is the technology able to be used to view patients/members that meet certain criteria, i.e., all Anthem members/patients that have diabetes, etc.?		Yes, as long as those attributes are in the data or can be derived from the data
8.10 What are the security requirements/processes for protecting the data and use of the software?		Built in password protected user based and role based discretionary access control. Encryption end to end on all data transmissions. Server to server encryption. Optional data encryption at rest. Optional integration with policy server for digital rights management (Adobe) for tethering encrypted documents. Optional trusted guard appliance for use across networks in different security domains.

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8.11 What requirements or DUA will be required for participants of the technology?		

*Legend:
✓: Zato Technology possible for demonstration

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