Clinical Content Vendors

A Review of the Field

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Abstract

In a previous note, we outlined some common characteristics of vendors in the physician order set and clinical content space, and the potential value of these systems both as sources of order sets developed with expert review and based on evidence or best known practice, and as platforms for content management. Here we look specifically at characteristics of the three major vendors in the field—Zynx Health ™ ZynxOrder ®, ProVation Order Sets, and BMJ’s Action Sets—and examine their relative strengths and distinguishing characteristics.

Introduction

All three vendors offer downloadable, evidence- or best practice-based order sets and some combination of the following features:

- An order set download, configuration, customization, and mapping environment, including a platform for online collaboration and discussion tracking;
- Links to evidence bases, embedded in the downloaded content;
- Ability to associate metadata with each order set (e.g., date of implementation; date of next review; clinical owner and reviewers); and
- A mapping and order set export process between the content vendor and the local EMR.

In addition, all offer a variety of associated services and related products. We describe each vendor’s background and basic tools, and present representative comments from interviews with vendor-selected reference customers. Table 1 provides a side-by-side feature and function comparison across the vendors. We conclude with a summary of the distinguishing characteristics of each vendor and recommended action items.

Zynx Health

Background

Zynx Health has been selling evidence-based content since its founding in 1996. Owned by Hearst Corporation, Zynx has over 2,000 hospital clients. In addition to ZynxOrder evidence-based order sets, the company offers interdisciplinary plans of care and other types of clinical decision support content, quality improvement tools, and customized service offerings.

Content Development Methodology

Zynx utilizes a rigorous methodology for the development of evidence and best practice-based order sets and other types of clinical decision support content. The Zynx clinical content team regularly reviews medical publications, guidelines from major medical professional organizations, and regulatory and quality measure requirements to ensure that content is informed by current medical evidence and professional opinion and conforms to regulatory requirements.

1 See the Applications and Technologies Collaborative research brief “Clinical Content-Knowledge Management Systems: Evidence-Based Order Sets and Knowledge Management for the EMR” (April 2012).
The Zynx software runs in a web browser, using a Software as a Service (SaaS) delivery model. With most EMR vendors, Zynx is able to import from the EMR a copy of the local order items catalog. The selected order sets can then be mapped against local order items to create a file containing the orders in the final order set. The order set can then be exported to the EMR using either a proprietary Zynx XML format or a vendor-specific proprietary format, depending on the capabilities of the specific EMR.

Zynx’s collaboration and order set build environment is called AuthorSpace®. Multiple subject matter experts can review, comment on, and modify order sets remotely and asynchronously in ViewSpace, the collaborative component of the Zynx software. The application maintains a log of the comments and revisions throughout the order set build process. Zynx permits assignment of basic metadata to each order set. This information can be used to manage the process of periodic review and revision.

Zynx provides ongoing surveillance of practice-changing events, guidelines, and performance measures, plus scheduled updates based on systematic searches of the peer-reviewed literature every six months. In addition, alerts based on clinically compelling events such as a U.S. Food and Drug Administration (FDA) drug alert or an announcement of withdrawal of a drug from the market is pushed to customers on a real-time basis.

Zynx also holds two patents related to methods for integrating content platforms with EMRs.

Both Zynx reference customers praise Zynx as a reference base and content source for well-vetted evidence-based order sets, and as a platform for review and collaboration.

One reference organization employed Zynx in a key role in an order set standardization effort across the health system. Zynx’s evidence-based content became the default standard for current medical knowledge and practice; whenever there was disagreement among clinicians, someone would point to the Zynx content and references and, in the words of the project lead, “the evidence prevailed.” Over a several-year period, the organization reduced their number of order sets from 470 to 170, permitting only one version of an order set for a specific condition or procedure. Another customer no longer uses Zynx order sets content, in part due to the complexity of using the Zynx platform to map against their local customized EMR order items catalogue, but rather treats it as a reference base against which to validate their internally developed order sets for currency and adherence to performance measures.

Zynx reference customers praise ViewSpace’s functionality as essential to managing order set review and revisions among reviewers, especially across large geographies. One customer finds the ViewSpace functionality so useful that they are using the platform to develop non-clinical content, such as policy templates to meet regulatory requirements.

The reference customers are less satisfied with the Zynx mapping and order set export functionality, which they describe as cumbersome and error-prone. One customer chooses to manually map all Zynx orderables to their EMR’s catalogue terms rather than use the Zynx tool, even though manual mapping is a very laborious process. Another uses their EMR vendor’s knowledge compiler to perform mapping and reconciliation rather than use the Zynx tools.
In addition, the reference customers do not use the Zynx content management platform to maintain their order sets over time, citing the platform’s lack of useful reporting capabilities and inadequate metadata tracking functionality. They perform most content maintenance outside of the Zynx platform; one customer uses SharePoint for this purpose, and another uses tools within their EMR.

ProVation Order Sets

Background

Publishing house Wolters Kluwer purchased UpToDate, the widely used online medical content publication, in 2009. ProVation Order Sets was launched in 2007 to build evidence-based and best practice order sets based upon and referenced to UpToDate content and using a joint editorial process. As of March 2012, ProVation Order Sets had 111 contracted customers in the United States, comprising 272 hospitals. Of these, 57 customers had completed implementation, and the remainder were in the process of implementing.

In addition to order sets, ProVation offers rules and alerts, care plans and “content modules” containing small sets of orders for specific conditions or therapies that can be used across multiple order sets.

Content Development Methodology

ProVation Order Sets employs a joint editorial process with publishers of UpToDate. Order sets are developed in a three-step process. ProVation authors review the medical literature and develop new or revised content in collaboration with UpToDate specialist experts. The content is then peer reviewed by a wider panel of experts, after which a grading editor reviews and grades the content according to strength of recommendations.

Delivery Model

Unlike the other vendors reviewed here, ProVation Order Sets is implemented using a client-server model so the purchasing provider organization implements the application locally, and thus owns a copy of the knowledge management platform. The advantage of this model is, should the organization decide to end their subscription to ProVation Order Sets, they still retain this platform along with all of the metadata and collaboration tools. The disadvantage is one of cost and complexity: rather than simply logging onto a web browser, the customer must purchase database and application servers, and desktop hardware must conform to certain specifications.

Order Set Build Platform

ProVation Order Sets Manager is the workspace for order set importing and building. Customers can view all available order sets in a Library view. When an order set is selected for implementation, all links to UpToDate evidence are imported to the local application with the order set and are visible to all reviewers. The application tracks authors, review dates, and other metadata on all order sets. It permits sending automated emails—for example, when an order set is due for yearly review—to listed reviewers asking them to review order sets. A message is sent from the ProVation Order Sets Manager to the email addresses of the reviewer(s), with a URL link to review and reassess the order set. Order Sets Manager permits multiple reviewers to work on an order set at one time, and keeps a log of all comments and revisions.

ProVation order content is indexed at a granular level, facilitating accurate and efficient integration into an EMR’s computerized practitioner order entry (CPOE) system. The high level of data structure also enables some unique functionality. One example is One Click Updates, which automatically informs order set owners about
new evidence that affects existing order sets and permits immediate updating of multiple order sets at once. It also permits merging of order sets, and anticipatory suggestion of relevant content during order set construction.

ProVation sends content updates to customers quarterly. In addition, alerts about important new developments (for example, FDA alerts) are sent automatically to customers as they occur.

**EMR Integration**

As of the end of March, ProVation Order Sets was able to export finished order sets to the EMR or for printing in the following file formats: standard XML, PDF, and RTF; CSV and interactive PDF (in testing); and the proprietary formats for EpicCare - Nursing Care Plans (testing), and Allscripts SCM; Cerner PowerPlans; McKesson ODT, iForms; and Meditech Magic and Client Server.

**Customer Reviews**

The three Provation reference customers point to several differentiators in their selection of the ProVation Order Sets product. All indicated that the near-universal physician recognition and use of UpToDate Online was an important factor, and the linking of order sets to UpToDate content was a powerful factor in obtaining physician buy-in for use of external content. All reference customers indicated a strong preference for the ProVation Order Sets client-server delivery model as it allows them to own and keep the content management platform should they decide to cancel their subscription to ProVation.

All ProVation reference customers liked the product’s knowledge management tools and they use them to track and manage order set content over time. Several customers had previous experience with Zynx and cited the stronger content management tools in ProVation as one of the drivers to switch vendors. Customers specifically cite ProVation’s tools for order set manipulation (i.e., naming conventions, line orderable mapping, search functionality, One Click Updates, and user role management tools), the ability to merge order sets, and strong customer service as perceived differentiators from competitors. One customer cited ProVation Order Sets’ smooth interface with their Meditech Client Server EMR as an important factor during their content vendor selection process.

**BMJ Group’s Action Sets**

**Background**

BMJ Group, publisher of the British Medical Journal and many other medical publications, launched an online order set product based upon their well-recognized paper and online Clinical Evidence and Best Practice publications in 2010. BMJ Group has strong international brand recognition, and the distribution of early Action Sets customers reflects this. At the time of this writing, BMJ Group has contracted with two clients in the United States, one in the Cayman Islands, and nine in the United Kingdom, all in various stages of implementation.

**Content Development Methodology**

Like Zynx and ProVation, Action Sets order sets are developed by a network of experts based on evidence from the medical literature, guidelines by professional organizations, Cochrane reviews, and other sources; and the order sets contain links to evidence summaries with links to relevant information in Clinical Evidence and Best Practice publications. In addition, Action Sets order sets are reviewed by experts from different global regions and modified according to different national practices, guidelines, and regulatory requirements.
Delivery model and order set build platform. Action Sets are delivered via SaaS. Action Sets was originally developed specifically to interoperate with the Cerner Millennium EMR. Customers with the Cerner EMR can download order sets from Action Sets directly into Cerner Care Designer, the EMR’s native order set development environment. Cerner customers choosing Action Sets thus may get the benefit of this unique level of integration, bypassing the need to export the order items catalogue and import and reconcile an order set file. BMJ Group has partnered with a third party to use their document management toolset for robust, easy-to-use clinical content design, build, management, and audit tools, similar to the Zynx and ProVation products. BMJ Group is able to import order item catalogues from EMRs, and export finished order sets to the EMR in file formats including XML, HTML, Microsoft Word, PDF and Excel.

Customer Reviews

All three Action Sets customers agree that a decisive factor in their selection of the BMJ Group product was the pricing—in all cases, well below half the price quoted to them for Zynx or Provation products. All reference customers indicate that the pricing offered by BMJ Group was part of a new market penetration strategy.

All reference customers employed Cerner’s EMR, and cited the potential for integration between the Action Sets content and the Cerner order set build tools as a factor in their selection. One customer subsequently determined that their Cerner order items catalogues were inconsistent and too heavily customized to take advantage of this integration; instead they are using the Action Sets content as a reference source and building their order sets from scratch in the Cerner EMR.

Other factors cited by reference sites included the perceived depth and breadth of content assimilated by the Action Sets team; international perspective (one non-US customer); and the broad skill base and deep experience of BMJ Group’s knowledge engineering team.

One customer uses the Action Sets platform for handling BMJ-identified required changes to medications or other elements of order sets. According to this customer, when a medication is withdrawn or a practice changes, BMJ Group identifies those customers who have affected content in their systems and notifies the customers. Following local review, this customer uses the Action Sets platform to push an XML file containing the new content to the EMR.

The reference customers were not aware of other knowledge management workflow functionality (such as a collaboration space, or the ability to email reviewers when a review is due). None of the reference customers indicated they use the platform for online review and collaboration; rather, they perform these functions separately by email.

One customer indicated that the non-US origin of the content was something of a hindrance to their clinicians when it came to adoption of certain simple practices. While major medical management practices were in common and provided assurance of overall adherence to evidence-based medical practice, many of the subspecialist groups preferred to build order sets for specific practices based on guidelines from their professional organizations rather than incorporate the BMJ Group material. The customer stated that BMJ Group “needs to do a better job of ‘Americanizing’ their content” if they are hoping to break into the US market.
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<tr>
<th>Table 1. Content Vendor Comparison</th>
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<tr>
<td><strong>Background</strong></td>
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<tr>
<td><strong>Contracts and Client Base</strong></td>
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<tr>
<td>Over 2000 US hospitals, International client base in Canada, UK, UAE</td>
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<td><strong>Service Delivery Model</strong></td>
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<tr>
<td>SaaS, EHR Direct Build Services (custom build in client EHR)</td>
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<td><strong>Content Types</strong></td>
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<tr>
<td>Order sets, Care plans, Rules, Care management checklists, Forecasters</td>
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<td><strong>Foundational Knowledge Reference Links</strong></td>
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<tr>
<td>Zynx Evidence links, Links to partner evidence providers</td>
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<tr>
<td><strong>Order Set Build Functionality</strong></td>
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<tr>
<td>ViewSpace collaboration space, Create standard workflows for content review and approval progress tracking, Build by importing EMR orders catalogue mapping to Zynx platform, Audit trail based on versioning</td>
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<tr>
<td><strong>Knowledge Management Functionality</strong></td>
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<tr>
<td>Track basic metadata, New evidence alerts within the order sets and plans of care, Notifications sent to clinicians when content is ready for review</td>
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<tr>
<td><strong>Update Frequency</strong></td>
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<tr>
<td>Scheduled updates every six months, Ongoing surveillance of practice-changing events, guidelines, and performance</td>
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<td>EMR Integration</td>
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| • Zynx proprietary XML format  
• Multiple vendor specific formats  
• Standard XML, PDF, and RTF; CSV  
• Proprietary formats for EpicCare for Care Plans (in testing), Allscripts SCM; Cerner PowerPlans; McKesson ODT, iForms; Meditech Magic and Client Server  
• Cerner: Direct import of order sets into Cerner Care Designer  
• Other vendors: XML file, PDF and HTML files; Extract of catalogue |

### Summary: Distinguishing Characteristics

#### Brand and History

Zynx has the longest track record and the most experience in the field. One consequence of this may be that their customers have had longer experience and time to identify shortcomings. On the other hand, all Provation customers pointed to the name brand value of *UpToDate* as a decisive factor in their selection of the product compared with Zynx.

The significance of Zynx’s possession of patents for aspects of the EMR integration process is unclear. Competitors indicated that they have reviewed these closely via multiple avenues and do not believe their processes or technologies infringe upon the patents. To date there has been no litigation surrounding the patents.

#### Service Delivery Model

ProVation’s local install of the order set build and knowledge management platform distinguishes their product from those of Zynx Health and BMJ Group. The initial cost of additional hardware appears to be more than counterbalanced by the security to the customer of owning the order set build and knowledge management platform.

#### Reference Base

All three vendors have respected content development methods based on literature, guidelines, and strong knowledge of regulatory requirements. In the US market, ProVation Order Sets receives the most plaudits for brand name recognition of their reference source, *UpToDate*; outside of the US and in the United Kingdom in particular, BMJ’s *Clinical Evidence* has strong brand recognition. Brand recognition can be important in gaining physician acceptance of externally developed order sets.

#### Order Set Build Functionality

Both Zynx and ProVation provide robust platforms for collaborative order set building. Provation has taken a very aggressive approach to rigorously structuring their content at a granular level, making it easy to manipulate. Provation customers expressed more satisfaction with their product’s build environment and the ease of manipulation and combination of order set components.

#### Integration with EMRs

This remains challenging for all three vendors. The magnitude of the challenge varies depending on the specific target EMR. Cerner customers may have an advantage in integration with BMJ Action Sets given their history of joint development for the Millenium platform. It is notable that Epic Corporation is the only major EMR vendor that has thus far not accommodated order catalogue export, or XML order set file import from the content vendor platforms.
ProVation has the best demonstrated knowledge management functionality of the three, and their customers take full advantage of this platform for ongoing management of their content. Zynx has only recently begun to address some aspects of workflow and clinical knowledge management that ProVation addressed from the outset, and no Zynx reference customers were utilizing the platforms for ongoing knowledge management.

**Action Items**

Health care organizations (HCOs) considering contracting with an order set content vendor should do the following:

- Be sure to see a full demonstration of all of the types of functionality covered in this report, with particular emphasis on the features and functions of the online collaboration/order set build platform(s) and the knowledge management functions.
- Request to speak with a customer who is utilizing the knowledge management functions of the candidate platform. Review with them the product’s ability to perform the specific functions covered here and in a previous report. It is our belief that possessing and utilizing robust processes and systems for the ongoing management of the clinical content that HCOs are building into their systems at an accelerating rate will be a key differentiator for organizational success in the future.
- Inquire into the vendor’s ability to integrate the content build and export the completed order set to your specific EMR product. Obtain names of reference customers who use your specific EMR version and can confirm the level of content platform-EMR integration that is possible.

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2 See the Applications and Technologies Collaborative research brief “Managing the Clinical Knowledge Lifecycle” (October 2011).