Improving Report Efficiency and Accuracy with ModLink

Over the past ten years, radiology dictation has become more efficient through the use of standardized voice recognition templates. Further gains in reading efficiency can be achieved by eliminating the manual dictation of measurement data. Automatically populating data into report templates achieves this goal. Radiologists at two healthcare facilities describe using a new solution that auto-populates report templates with appropriate measurement data. At one site, radiologists realized an average time savings of 30 seconds per exam. Time savings extended to the technologist when manual data entry was eliminated. To streamline workflow and reduce reporting errors, radiologists must embrace new tools such as ModLink™ from PACSgear. This paper discusses how ModLink increases productivity, enabling radiologists to focus on clinical narrative, convey depth of expertise, maintain required levels of productivity, and increase quality of life.

Structured reports and structured measurements

Voice recognition has revolutionized the practice of radiology. The inclusion of template-driven reporting has further enabled dramatic improvements in radiologist reading efficiency. Standardized report layouts and content have significantly reduced the amount of text dictated by the radiologist, reducing transcription expense and enhancing clinical quality. However, these improvements do not address the handling of measurements and other clinical data.

Report templates include data fields to indicate where associated measurements should be placed. For most sites, inserting measurement data requires manual dictation. These measurements are typically captured on a technologist worksheet or manually entered into a report by the technologist or sonographer. Automating this step can reduce data entry errors. This document reviews the opportunities and benefits of streamlining workflow through process automation and presents an available solution.

The measurement data conundrum

Adding quantitative measurements increases the value of the radiology report. These measurements can enhance monitoring of disease status and progression, as well as treatment effectiveness. For example, ultrasound exams typically include 5 - 10 measurements; some exams incorporate 20 or more data values. Other imaging modalities, such as CT, MRI, nuclear medicine, color Doppler, and DEXA may include similar quantitative measurements. These measurements are added to reports, often manually by radiologists and technologists. Within the report template, structured fields are used to organize measurement data and to suggest proper placement. Previously, automatically populating these fields has also been limited by a mix of structured (numeric) and unstructured (textual) data. While some imaging vendors have addressed the data issue by capturing structured data at the modality, many sites continue to rely on scanned worksheets for their “digital” measurements. This practice is particularly true for ultrasound exams, where standard imaging protocols may not have been adopted. Technologist efficiency...
and accuracy can benefit from a solution that automatically inserts these measurements into the radiologist’s report (see sidebar - **ModLink Forms** streamlines workflow).

One facility embracing this new approach is South Jersey Radiology Associates (SJRA), a large outpatient imaging center practice in Southern New Jersey. Working with their ultrasound vendor, SJRA recently standardized image and data acquisition protocols across their 18 ultrasound systems and realized a 15% improvement in technologist efficiency. Dr. Randall W. Snyder, III, head of ultrasound at SJRA, saw an opportunity for their 43 radiologists to continue benefitting from standardization. “Since all of our radiologists read ultrasound, we knew there had to be a significant opportunity to leverage this new capability,” he said. “We just had to find a way to automatically insert structured measurements into our PowerScribe 360 | Reporting templates.”

Another forward-thinking organization, Kootenai Health in Coeur d’Alene, Idaho, recently began standardizing and automating measurement capture on their six ultrasound systems. Their 13 radiologists wanted to streamline reporting for their daily volume of 60 ultrasound exams. They recently implemented **ModLink** from PACSGEAR to eliminate the need to dictate measurements for their fourteen most common ultrasound exams. These account for over 50% of their daily ultrasound volume. Dr. Albert Martinez, radiologist and president of the radiology group for Kootenai Health commented, “Our sonographers were trained to enter certain exam measurements on behalf of the radiologist. Both our techs and our radiologists have already saved a ton of time from our adoption of automated handling of measurement data.”

**Significant time savings and clinical quality impact**

The time savings enabled by the automated insertion of structured measurement data into the report is significant. Ultrasound exams typically include 5 - 10 measurements per study, with more complex Doppler and pathology exams having between 20 and 30 data values. Since a radiologist takes approximately three seconds to dictate and check each measurement, saving 30 seconds per report is achievable. With these time savings, radiologists have the opportunity to improve report quality.

“...Both our techs and our radiologists have already saved a ton of time from our adoption of automated handling of measurement data.”

To accurately visualize, dictate, and verify each dictated measurement, radiologists must look at both the PACS and dictation displays, potentially affecting the interpretation of subtle, visual cues. “Eliminating dictation of measurements doesn’t just improve productivity, it also enhances my ability to focus on my clinical evaluation and interpretation,” emphasizes SJRA’s Dr. Snyder. “When dictating measurements, my gaze continuously shifts between the report and the PACS displays, which are not typically adjacent to each other. This not only slows me down, but also challenges my ability to observe subtle, peripheral changes. I believe radiologists have an opportunity to increase their value by thoroughly communicating clinically significant changes as opposed to merely dictating numbers. The quality of care my patients receive benefits from my ability to spend more time studying the images and enhancing my clinical interpretation, enabling me to add real value to these examinations for my referring clinicians.”

Improved handling of measurement data also leads to enhanced report content, quality, and...
consistency. In order to maintain high levels of customer satisfaction, radiology practices must consistently produce high quality reports for referring physicians. Today’s radiology practices benefit from the standardization of all aspects of the report, including layout. Kootenai Health’s Dr. Martinez points out, “Our customers prefer consistently structured reports. Their ability to quickly understand our findings is enhanced by knowing what clinical information to expect and how it will be presented. This reduces the time our radiologists spend on the phone to clarify findings for referring physicians, for example. In the end, these reports further our ability to provide good customer service.”

Table 1:

<table>
<thead>
<tr>
<th>Ultrasound Exam Type</th>
<th>Time Savings (m:ss.s)</th>
<th>% Time Savings</th>
<th>Average Number of Measurements Per Exam</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdomen</td>
<td>0:14:3</td>
<td>17%</td>
<td>6</td>
</tr>
<tr>
<td>Pelvis with TV</td>
<td>0:32:9</td>
<td>21%</td>
<td>19</td>
</tr>
<tr>
<td>Carotid</td>
<td>0:30:2</td>
<td>21%</td>
<td>8</td>
</tr>
<tr>
<td>Renal</td>
<td>0:17:3</td>
<td>25%</td>
<td>14</td>
</tr>
<tr>
<td>Pelvis</td>
<td>0:36:2</td>
<td>29%</td>
<td>19</td>
</tr>
<tr>
<td>Renal/Bladder</td>
<td>0:39:7</td>
<td>40%</td>
<td>11</td>
</tr>
<tr>
<td>DEXA</td>
<td>1:06:5</td>
<td>98%</td>
<td>10</td>
</tr>
<tr>
<td><em>Overall Average:</em></td>
<td>0:32:7</td>
<td>35%</td>
<td>12</td>
</tr>
</tbody>
</table>

*Overall Average: 0:32:7 (n=21 individual study points)

Like Kootenai Health, SJRA recently implemented ModLink from PACSgear, to ensure that their PowerScribe 360 | Reporting voice recognition templates are populated with the correct measurement data. To quantify the productivity benefits of this automation, Dr. Snyder compared his reading efficiency with and without ModLink for 21 ultrasound and DEXA imaging studies. His findings, summarized in Table 1 show that he reduced his exam reading time by 35%. Since Dr. Snyder reads approximately 60 ultrasound exams daily, he expects to save roughly 30 minutes per day.

Automatically populating measurements into voice recognition templates can create notable time savings regardless of exam type. Dr. Snyder points out that “even though we are in the early stages of automating almost 50 different types of ultrasound exams performed at SJRA, we have already realized a substantial gain in reading efficiency.”

Dr. Martinez from Kootenai Health also recognizes opportunities for significant time savings, but is quick to point out that the benefits of using ModLink go beyond productivity. “The most significant impact is on clinical quality, report accuracy, and workflow. While productivity is critical, we are always looking for ways to enhance our value to our customers. We believe the streamlined workflow that ModLink enables helps us achieve these goals by enabling our radiologists to focus on and think through their interpretation and report comments.” This view was echoed by Dr. David Miller, radiologist at SJRA, who is not surprised by the time savings and feels the real benefits are more qualitative. “The greatest challenge now is to understand how this new capability can improve the quality of service we provide. Our continued success depends upon our ability to consistently provide our customers with accurate, high quality reports that include a valuable clinical narrative.”
Complex exams

Depending upon exam type and findings, increasingly complex exams may include more measurements and may benefit from a more detailed clinical narrative. While it would be easy to assume a direct correlation between the number of measurements and time savings, in practice the situation is more intricate. A complex case may spend proportionally more time thinking through my interpretation, which naturally may offset time saved by not having to dictate measurements. Again, time savings is important, but does not trump clinical quality. ModLink enables me to spend my time wisely and ensure that my observations and recommendations add real clinical value.

Enhanced clinical follow-up

In follow-up image studies, the quality of the exam also benefits from consistent exam protocols and report structure. More accurate comparisons can be performed, which is increasingly important as reimbursement becomes tied to clinical quality. Dr. Snyder points out that approximately three-quarters of SJRA’s ultrasound exams have historical comparisons and periodic follow-up. “Standardized imaging follow-up not only facilitates the reading process, but also improves the quality of the diagnostic comparison I can...
make. Knowing that measurements can be reliably compared enables me to deliver a higher level of care with greater confidence. Our payers and referring physicians appreciate this.”

More about saving time and increasing quality

Like all physicians, radiologists are time-constrained. Tool such as ModLink are designed to help radiologists find more time, allowing them to guide and oversee. While practices and departments vary, radiologists have universally appreciated the time saved by eliminating the manual dictation of measurements. In many cases, removing the burden of manual dictation has translated to increased quality of life. When technologists are responsible for entering clinical measurements into a report, the benefits can be even greater; ModLink automates these manual tasks to improve staff productivity and reduce potential human error.

From the efficiency study discussed earlier, a radiologist reading 60 ultrasound exams daily should save approximately 30 minutes per day using ModLink. Facilities performing 50,000 annual ultrasound exams should expect a return on investment (ROI) in six months or less—an ROI that every radiologist should find easy to support.

To review, key benefits derived from auto-population of measurements into the report include:

1. Improved reading efficiency through the elimination of manual data entry.
2. Increased clinical quality by spending more time on diagnostic assessment.
3. Reduced errors from manual data entry.
4. Enhanced customer service due to improved consistency of clinical narrative.
5. Increased intellectual engagement that strengthens diagnostic confidence.

Broader opportunities

SJRA plans to expand the use of ModLink to include more complex exam types, as well as functional studies. Dr. Miller believes “that cardiac, GI function studies, aortic stent graft, and aortic valve replacement pre-surgical planning studies should also benefit. Any opportunity to reduce report errors, increase radiologist productivity, and add clinical value should be embraced.” Dr. Snyder adds, “Diagnostically complex exams that include numerous quantitative measurements are clearly the next opportunity. We want to embrace all opportunities to achieve time savings from measurement-intensive exams, and to improve clinical quality. My colleagues and I anticipate having more time to scrutinize the subtle details captured by today’s sophisticated imaging systems, and expand the quality and consistency of our reports.”

“Eliminating dictation of measurements...enhances my ability to focus on my clinical evaluation and interpretation.”

Kootenai Health is also evaluating opportunities to expand its use of structured measurements to DEXA, nuclear medicine, and eventually interventional radiology studies. Dr. Martinez reminds us, “Increasing documentation demands require us to include x-ray and contrast agent dose, in addition to anatomic and physiologic measurements. Our practice is aggressively addressing these new documentation requirements in a way that maintains streamlined workflow and a high level of customer service.”

To address ongoing documentation concerns and improve data capture workflow, PACSGEAR recently introduced ModLink Forms. This software-based solution eliminates two labor-intensive data capture scenarios for technologists and sonographers: 1) scanning paper-based forms, 2) entering data manually in voice reporting systems. Tools like ModLink Forms can give technologists more time with their patients, while reducing the...
Leaders of radiology departments and independent practices who seek to enhance clinical value and business productivity should consider how these providers’ actions and experiences translate to their own situations. The organizations described in this paper represent both a private imaging practice and a community-based radiology department. Both groups started with ultrasound, but quickly saw how other imaging modalities could benefit from the same streamlined workflow.

**An available solution**

**ModLink** is an easily implemented software solution that transfers structured report measurements directly into PowerScribe 360 | Reporting using PowerScribe 360’s Web Services API to auto-populate reports with measurements taken by the technologist or sonographer. **ModLink** supports DICOM Structured Report (SR), HL7, or XML measurement data and can be combined with **ModLink Forms** to streamline the data capture process (see sidebar - ModLink Forms streamlines workflow). Numeric and textual measurements can be normalized across different systems to improve accuracy. **ModLink** can incorporate measurements from other modalities, including CT dose.

Like other businesses, radiology practices must enhance revenue opportunities and increase productivity to remain profitable in today’s highly competitive markets. Practices that ignore quality of care and customer service do so at their own peril. Ironically, the adoption of voice recognition reporting templates has the potential to reduce the value of the radiologists’ narrative through excessive standardization, negating value added through customized content and clinical consultation.

Tools like **ModLink** enable radiologists to focus on clinical narrative, convey depth of expertise, maintain required levels of productivity, and increase quality of life.

For more information, contact PACSGEAR at sales@pacsgear.com.

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**ModLink Forms streamlines workflow**

Replacing paper-based technologist documentation with electronic forms can improve the structure of clinical documentation. It can also bring the clinical narrative closer to the point of image acquisition. Electronically capturing both quantitative and qualitative data eliminates the need to scan paper forms into PACS. These forms can be manipulated on a tablet or laptop and then automatically stored in the patient’s folder on PACS. Tools like **ModLink Forms** take captured data fields and automatically populate PowerScribe 360 | Reporting templates, amplifying time savings for both technologists and radiologists.