Toray Composite Materials America Uses Siteline for Point-of-Need Learning

Toray Composite Materials America

Best Advance in Learning Technology Implementation

December 2018

Company Background

Headquarters	Tacoma, Washington
Year Founded	1992
Revenue	$228.9 million
Employees	201-500
Global Scale (Regions that you operate in or provide services to)	Nationwide
Customers/Output, etc. (Key customers and services offered)	Boeing (aerospace and sports-grade carbon fiber).
Industry	Carbon and Graphite Products
Stock Symbol	TRYIF
Website	www.toraycma.com

Budget and Timeframe

Overall budget	$2.1 million
Number of (HR, Learning, Talent) employees involved with the implementation?	25
Number of Operations or Subject Matter Expert employees involved with the implementation?	20
Timeframe to implement	1 year
Start date of the program	Jan. 1, 2018

Business Conditions and Business Needs

Toray Composite Materials America Inc. (CMA) is the leading innovator and supplier of carbon-fiber materials. Continued growth, including a renewed 10-year, multi-billion-dollar contract with Boeing, has put pressure on existing capacity and necessitated physical expansion at the plant, as well as new systems upgrades — most notably a new manufacturing execution system (MES) and a new facility in South Carolina. However, CMA's training and reference materials consisted of three-ring binders full of work instruction, which added time to production.

Overview

As a result, Toray Composite Materials America Inc. hired AllenComm to help implement Proficy, a new manufacturing execution system that promises to integrate core business systems with shop-floor equipment in an effort to increase standardization, efficiency and productivity within the Tacoma facility. The partnership between AllenComm and CMA yielded an exceptional and innovative training solution — one consisting of a performance support application (Siteline) that features 3D modeling, a content enablement library, skill checks and evaluations, user data dashboards and scanning components.

Four components — work instructions, web-based training, instructor-led training and video tutorials — serve as the bedrock of the learning ecosystem that AllenComm and CMA implemented within the Tacoma facility. Ultimately, integrating these components

with the Siteline technology will produce an advanced, technologically savvy training environment that will yield considerable improvements in on-site employee performance.

The Siteline mobile application draws on cutting-edge learning technology paired with advances in visual computing and modeling to address these lost costs. Specifically, Siteline uses a unique visual performance support (VPS) model to accelerate learning, provide superior on-the-job support and help make critical processes stick.

The VPS model features a content structure that pairs a powerful content library, which provides general access to all content in the system, with highly visual 3D models. The user can access content through either medium, as well as navigate back-and-forth between the visual models and the library. This allows learners to find content through traditional text-based searching or to refer to realistic models to find location-specific content and visualizations. This visual cross-referencing of content helps with recall by allowing users to "see" reference points within their physical working environment. It also helps today's increasingly visual learners find content in a natural way that better suits their preferences.

Because the speed of content access is another critical factor in effective performance support, the VPS model entails an innovative scanning function that uses the mobile device's camera to scan physical cues such as stickers and screens in the working environment and rapidly access location or context-specific content and trouble-shooting. The scanning capability paired with the system's personalized toolkits and skill-check system further adds to the VPS scheme, providing layers of intuitive and immediate performance support and helping users make connections between conceptual support content and their actual work site.

Design of the Program

Work Instructions

The image below represents AllenComm's design for the work instructions. The top of the page has a "hero image" of machine parts, as well as title of the work instruction. Below the title is a set of links to different elements of the overall training.

Below the hero image, title and related links is a set of text that calls out (1) the purpose of the work instruction and (2) the key topics within the work instruction.

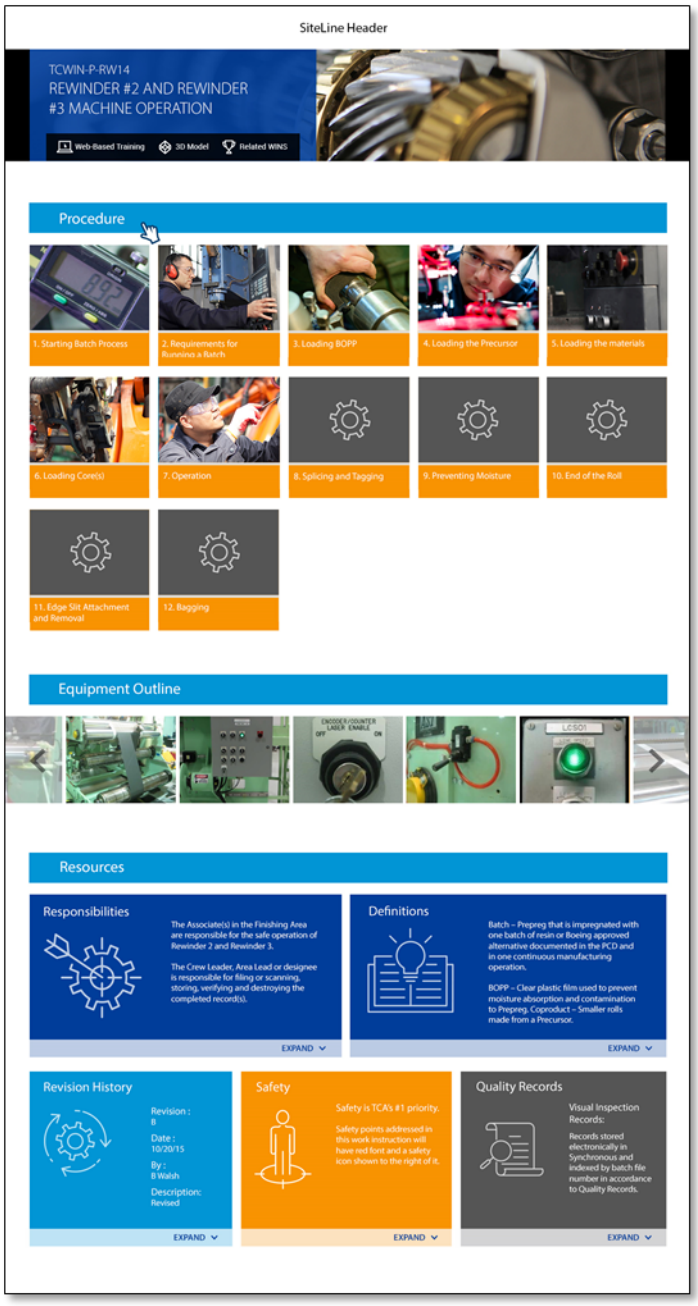
The next section ("Procedure") features each of the key steps of the work instruction. Some work instructions have as few as five steps, whereas others have as many as 25 steps. It is important for technicians to see all of the steps at once because it enables technicians to get to the information they want with as few clicks as possible.

When learners click on one of these tiles, an additional page will subsume the screen. This page features photographs, videos and text that help to describe and demonstrate each step within the broader process.

The next section ("Equipment Outline") consists of a carousel of images of relevant machines, tools and controls that technicians will need to complete the task at hand. The equipment outline features an image and label for each machine, tool and control.

The last section at the bottom of the page contains responsibilities, definitions, revision history, safety and quality records. Each of these pages can be clicked on to reveal additional content. Safety tips are shown throughout the work instructions, not just here at the bottom.

Figure 1: AllenCom's Design for the Work Instructions



Source: Toray

Web-Based Training

The image below represents AllenComm's design for the web-based training modules. The title of the module topic displays at the top, as well as a short motion graphic that will introduce technicians to the value in the training module.

Each module is broken into three sections:

- **What** — In this section, technicians will learn what the topic is. AllenComm will feature brief textual descriptions, as well as key data points.
- **Why** — Here, technicians will learn why the topic is important. If this module was intended to introduce the new MES technology, for example, then this module would explain why it is important for technicians to master it (i.e., it increases safety, it increases product quality, etc.).
- **How** — Finally, each module will conclude with a section that explains how the technician is expected to use and operate the training topic. If this module addressed the topic of hand scanners in the creel room, for example, then this module would break down how technicians are expected to use those tools.

Each module consists of three additional elements:

- **Content Presentation Pages** — These pages will feature an image with concise text.
- **Mini-Activities** — To increase learner engagement, each module will feature a set of interactive mini-activities that prompt technicians to think through a set of hypothetical troubleshooting situations.
- **Knowledge Checks/Quizzes** — These pages assess the learners' comprehension of the training material. Each knowledge check will consist of five to 10 questions.

The modules are designed to (1) be visually engaging, (2) be concise and interactive, (3) offer virtual simulations of likely work-related problems and (4) give evaluations of learner development.

Figure 2: Module Design

Source: Toray

Video tutorials

Emulation Video (See it, Do it)

The learner sees a walkthrough video such as one outlining the process of material transfer in MES. The video covers the end-to-end process, including but not limited to: navigating to BIN transfer entry screen, entering stamp number and password, scanning Lot ID, entering BIN location and confirming.

Walkthrough

After seeing the process through video, learners go through a guided emulation through the same steps but for a different shop order, requiring them to repeat the process they've been exposed to while applying critical thought to new data.

Troubleshooting

Technicians are presented with a scenario such as a hopper being assigned incorrectly. Technicians are then given instructions on where material should be disposed. They will navigate to production reporting, hopper contents disposition and reassign hopper contents menu. Once there, they will apply the information from the scenario (shop order number to be transferred from and to) and will confirm the transfer.

Assessment

After troubleshooting, there is a summative activity allowing learners to demonstrate their knowledge.

Instructor-Led Training

These manuals are designed to help trainers administer lessons, exercises and tests for trainees. Each lesson features the following elements:

An estimated training time that defines the length of the training exercise.

A breakdown of the lesson in terms of review, explain, demonstrate, practice and assess.

Speaking in general terms, what each lesson provides is a review a previous training exercises, a short lecture and tutorial of a common, on-the-job challenge and a mentor-led assessment of the technicians' progress.

This training mainly happens on the production floor where technicians can build their knowledge while simultaneously being a productive employee on the floor.

The training manual is integrated with the work instructions and the web-based training. The activities prompt technicians to find answers on the new Siteline technology (i.e., where the work instructions live) and specific web-based training modules.

Delivery of the Program

All the content that AllenComm produced for CMA was put into the Siteline app. Users can access the content from tablets and stations placed at strategic locations around the production floor.

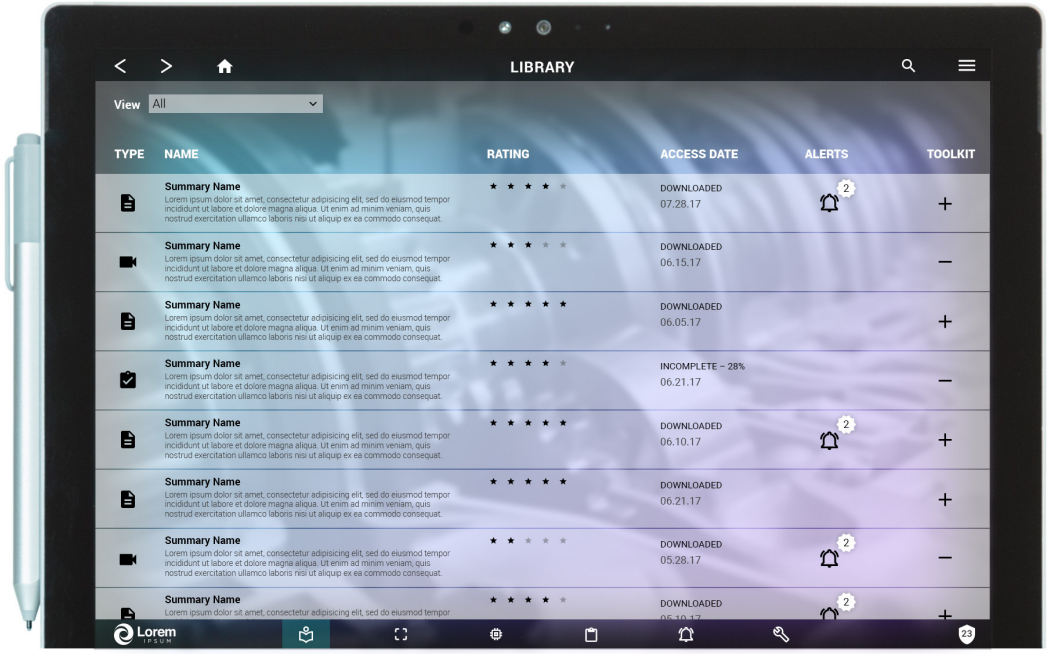
Figure 3: Tablet View

Source: Toray

Content Library

A content library provides text-based access to all content in the system. It is a searchable, filterable catalog built to help the user navigate quickly to the content they need, when they need it.

Figure 4: Content Library

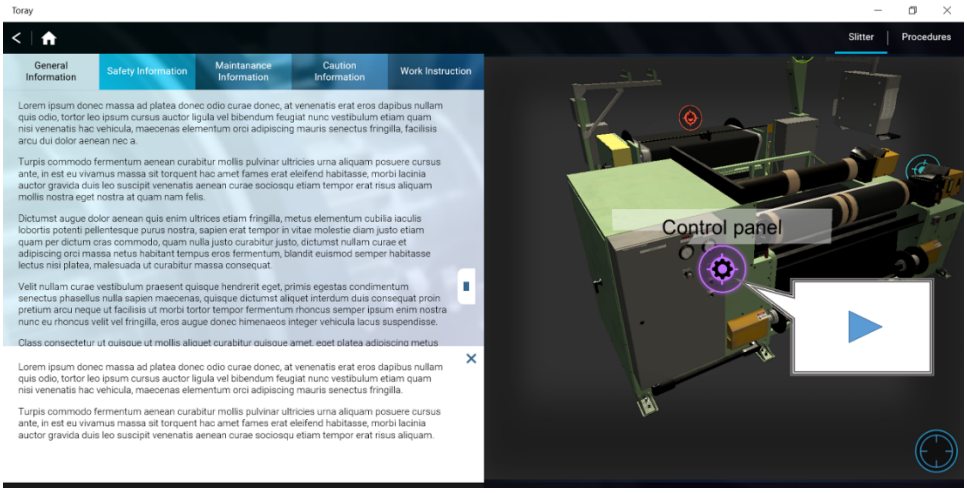


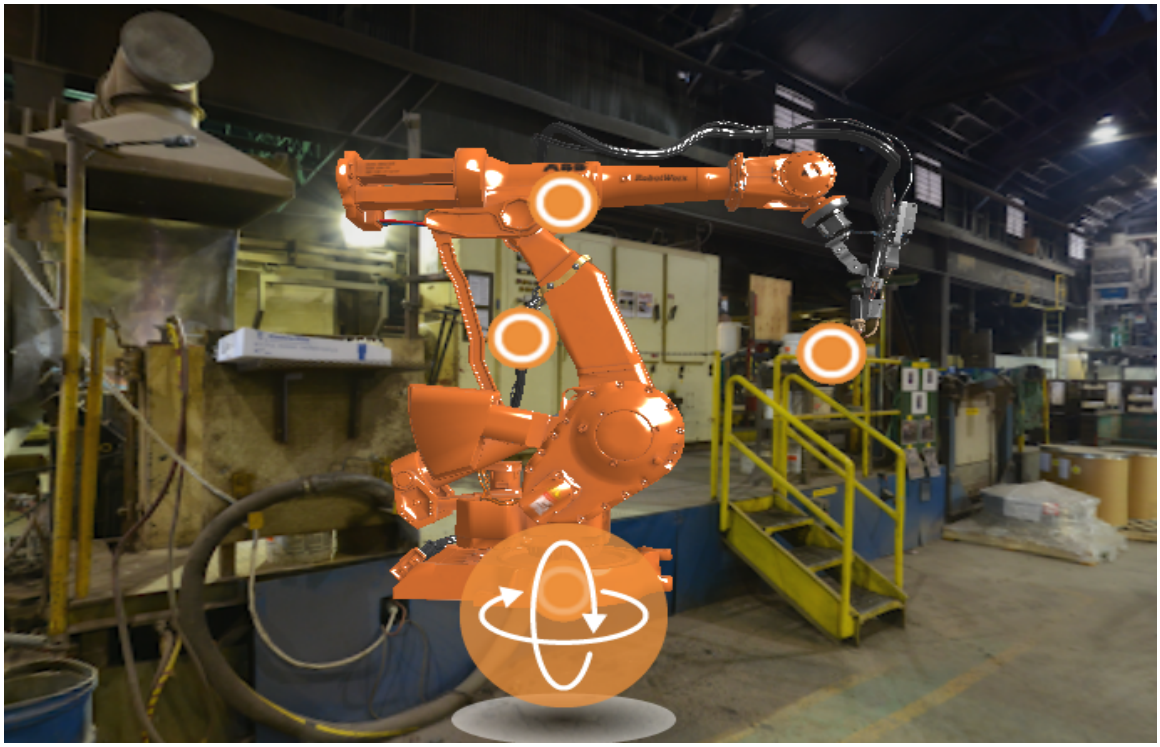
Source: Toray

Machine Models

Machine Models are highly visual, interactive models of tools and machines for the user's role. The models include hot spots that provide access to location-specific content, allowing users to quickly find support content and troubleshooting based on which machine or which part of a machine they may be working on.

Figure 5: Machine Models





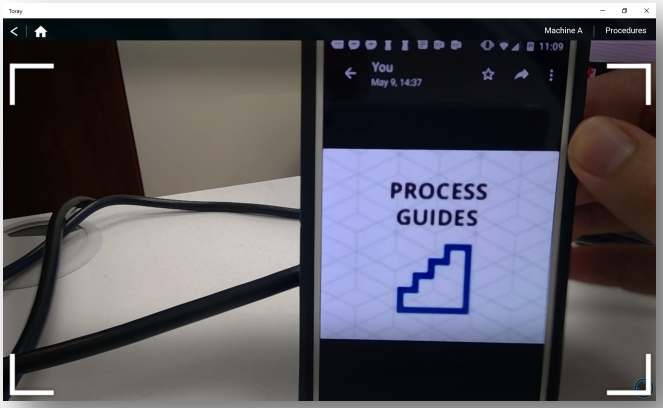
Source: Toray

Scanner

The scanner uses the device's camera to recognize cues in the physical environment (stickers, error screens, etc.) and then to deliver context-specific content. For example, a

user may scan a sticker in a maintenance area to see a pre-populated list of maintenance checklists, support content and policies. Scan content may also be displayed specific to a user's role so that different roles see different content at the same scan point.

Figure 6: Scanner



Source: Toray

Skills Checks

Skills checks are triggered on a recurring basis using a configurable review schedule. These activities help users to self-assess critical skills and knowledge points. When a learner isn't confident in or doesn't correctly complete a skill check, the system triggers a targeted content review.

Notifications

Assignments are given for the individual user. Here a user can see any content or activities assigned to them in the system.

Toolkit

The toolkit is a configurable, personal library designed to store and provide quick access to any library items a user may want to refer to often.

Change Management Efforts

The greatest challenge facing the teams was the amount of content to be produced. AllenComm's team of 10 writers worked within a strict standardization and consistency process to mitigate the differences in writing styles between individual writers. The design and writing teams worked together to create a detailed style and consistency guide to ensure that the final product would have a unified look and feel. One writer worked to perform in-depth consistency checks and reviews of all the produced content.

Measurable Benefits

The Siteline pilot took place at the Tacoma facility and investigated hardware, network, user attitudes, configurations, and performance metrics. The overall role of the first pilot phase was to lay a foundation for final configurations of the Siteline app, CMA network, physical devices, and set-up. In terms of business impact and operational targets, the pilot should be considered a full success. Standout result include:

- 86% of users agreed or strongly agreed that Siteline would allow them to do their jobs faster and with fewer errors (only 1 participant disagreed)
- 75% of pilot users agreed or strongly agreed that they would be more likely to refer to work instructions in Siteline, compared to the current system

Given the typical organizational challenges with introducing new technology and resistance to change generally, these results are very encouraging. Additionally, current state benchmarking, combined with new features and search standards in Siteline, suggests that content search times can be reduced per shift by at least 15 – 30 minutes for an experienced technician (likely much more for a new technician).

Overall

During pilot testing, AllenComm discovered several key points, summarized below.

Users consistently asked about other systems that they might be able to access on the tablets. These include systems like MS Dynamics, UMAC, MES, email, HR systems, CATSweb, etc. CMA and its IS team likely will want to address these general tablet questions prior to systems launch.

Users asked about messaging systems within Siteline or on the tablets (i.e., between shift leaders and crews or between shifts). While this is not currently a planned feature for Siteline, AllenComm can add it at CMA's request.

Printing from Siteline also remains an open question. This was not a feature planned in original Siteline blueprint and it does open some network and formatting questions if CMA wishes to allow it from the factory floor.

Conversations on integration or replacement of CMA's current document management system are ongoing and may influence the final design of the system.

About Brandon Hall Group

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