InfoGuide Case Study

Global Semiconductor Manufacturer Implements Next-generation Technical Training Solution
This case study focuses on a global semiconductor manufacturer that uses Flatirons Solutions’ next-generation training solution, InfoGuides, to capture skilled workers’ knowledge to on-board a larger, low-cost labor pool. InfoGuides are detailed yet simple-to-follow, interactive work instructions for accurately performing highly complex technical tasks.

Global Semiconductor Manufacturer Captures Skilled Workers’ Knowledge to On-board Larger, Low-cost Labor Pool

The high-tech and semiconductor industries are experiencing a number of challenges with their workforce. Their most skilled and experienced employees are rapidly approaching the age of retirement. Older workers represent the majority of the labor pool. According to a 2012 study by the U.S. Bureau of Labor Statistics, 28% of high-tech industry mechanics are 50 years old or older, and only 9% are under the age of 25.

This lopsided age distribution means that there is an immediate challenge to capture and document the knowledge of existing staff and repurpose it to train the next-generation workforce. Yet recruiting, on-boarding, and retaining a new candidate can be a costly burden to high-tech and semiconductor companies. Training content for operating and maintaining complex equipment requires the highest quality, because no company can afford downtime stemming from operational issues. In addition, yesterday’s classroom-based training falls short of today’s digitally savvy workforce who expect smart, easy-to-use, interactive tools. Plus, high-tech and semiconductor companies must put in place on-boarding programs that allow new employees to be productive as quickly as possible.

28% Percentage of high-tech industry mechanics who are 50 years or older. U.S. Bureau of Labor Statistics

One leader in the semiconductor industry faced these challenges and contracted Flatirons Solutions to deliver a cost-effective and affordable solution to its staffing problems associated with the maintenance and repair of complex and high-value equipment. The solution Flatirons delivered was InfoGuides — detailed yet simple-to-follow, interactive work instructions for accurately performing highly complex technical tasks.
Project Overview

The Challenge

This global semiconductor company needed to increase the number of qualified staff available to carry out maintenance of its equipment used to manufacture microchips. The equipment in question is of especially high value and any down-time could be detrimental to the business.

Typically, highly skilled and experienced workers would carry out maintenance on this specialized equipment. However, the workforce was nearing retirement and had a high degree of “tribal knowledge.” These staff had acquired many of their skills on the job, but the best practices they had learned over time were rarely shared and had not been captured so others could learn from them.

This created a dependency on a small pool of the most senior and highly paid staff. A limited pool of highly skilled staff nearing retirement presented a challenge to the company. The company needed to find a solution to train the next-generation, global workforce so they could on-board a lower cost employee base capable of performing preventive maintenance work as proficiently as its experienced staff.

Yet what they found was that many entrants to the labor force — including millennials and technology natives — had a high degree of theoretical knowledge of the required skills but lacked practical experience or expertise. They needed the “tribal knowledge” of their senior colleagues in order to efficiently and effectively carry out maintenance tasks.

In addition, due to the high utilization of the equipment in question, the company needed to maintain preventative maintenance cycle times through a high degree of execution quality. Any rework to preventative maintenance would be a severe detriment to the business. Continuous operations schedules and limited maintenance windows also meant that the employee learning curve had to be minimized.

The Solution

Working with Flatirons Solutions CORENA Managed Content Services team, the customer developed a series of interactive InfoGuides for performing preventive maintenance tasks on the company’s equipment. Each InfoGuide is a self-contained, next-generation technical publication that provides detailed and easy-to-consume work instructions that let even the most inexperienced staff carry out technical maintenance tasks accurately and efficiently.
To capture tribal knowledge of senior staff, our team shadowed subject matter experts while they conducted specific maintenance procedures. Our technical writers documented their procedures and developed step-by-step instructions for maintenance preparation, health and safety precautions, as well as set-up, testing, and return-to-service procedures.

To facilitate execution and help ensure the quality of each step performed, our illustration and multi-media teams enhanced the procedures with annotated images, 3D graphics, and audio-visual aids.

In addition to producing InfoGuides for nearly 9,000 maintenance procedures, the solution included putting in place a streamlined process to support the development of between 1,200 and 2,000 InfoGuides for the customer each year.

Results
By developing a series of InfoGuides, the company now has training tools that enable them to hire employees from a larger, low-cost labor pool. The in-depth knowledge captured from experienced staff and documented in the InfoGuides enables new employees to perform preventive maintenance tasks proficiently from the first day on the job. As a result, in one year alone the company hired more than 200 employees at a lower wage level than its most senior, retiring staff for a cost savings of more than $11,000,000.

One significant proof point demonstrating the effectiveness of InfoGuides was demonstrated through a pilot. Partnering with our customer, Flatirons Solutions tested the effectiveness of an InfoGuide to validate that a non-technical individual could perform detailed preventive maintenance (PM) tasks with no previous training.

After developing a maintenance procedure for a specific component, we tested the effectiveness of an InfoGuide — including the quality of the technical content and instructional clarity — by having a non-technical employee with no experience working with semiconductor equipment perform the maintenance procedure.

The following are the results of the pilot:

- Wet clean took only 10 minutes longer than an experienced maintenance technician.
- There were zero rework errors, compared to 1 to 3 rework errors for an experienced maintenance technician using their own acquired tribal knowledge.
- The procedure included complex tasks such as software interaction, detailed PM tasks, PM verification tests, and putting the component back into production.
- It was demonstrated that InfoGuides can enable new, non-experienced employees to perform proficiently with minimal training.
Benefits

- **Up to 50% Reduction in Labor Cost**
  By equipping lower-skilled workers for maintenance tasks with InfoGuides, our customer was able to save up to 50% on labor costs.

- **Capture “Tribal” Knowledge**
  By capturing undocumented knowledge of experienced staff before they retire, continuity of valuable maintenance information is ensured.

- **Minimize Learning Curve: New Employees are more Productive from Day 1**
  Enable new employees to perform maintenance on complex equipment accurately and effectively, achieving a higher level of productivity in significantly less time.

- **Reduced Preventative Maintenance Rework**
  Procedural adherence ensures the correct process is followed, leading to quality improvements and the reduction of rework.

- **Reduced Equipment Down Time**
  Measuring performance by time taken between unskilled and skilled workers resulted in a negligible difference of equipment down time.

- **Capture “Process” Knowledge**
  The information captured in the InfoGuides process is being leveraged to facilitate subcontracted and/or outsourced manufacturing operations. This allows for more efficient procurement processes (RFQ, supplier selection, SLAs and other contract terms and conditions) and shorter time and costs to transition work.

Why Flatirons Solutions?

We are experts at Turning Content into Knowledge® and delivering high-quality and innovative training solutions where:

- There are high-value or complex assets involved.
- The consequences of downtime and inefficiencies are significant
- Efficient return to service is crucial
- Technical content is dynamic – constantly changing and evolving
- There are strong compliance or regulatory needs
- Content Lifecycle Management is imperative
- End users of content are mobile or work remotely
ABOUT FLATIRONS SOLUTIONS

Flatirons Solutions® provides solutions for content lifecycle management for large asset industries like aviation, defense, rail, and marine. For more than 20 years, it has helped manufacturers, operators, and military forces maintain and operate complex assets more effectively. Its software and service solutions help organizations to deliver the right information, at the right time, to the right people.

ABOUT CORENA SUITE

The CORENA Suite™ from Flatirons Solutions® is the leading solution for content lifecycle management developed specifically for organizations that rely on mission-critical data to design, manufacture, operate, or maintain complex assets over product and service lifecycles as well as across their business networks.