

Case Story



Business Development Services



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Quantum Rehab Incorporates Printing of Product Manuals into Lean Manufacturing Workflow

Five imagePRESS C700s Save Time, Reduce Costs, and Increase Efficiency

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Introduction

Quantum Rehab (Exeter, PA) is a leading provider in expertly designed and innovative power wheelchairs and other related technologies to improve a user's quality of life. Serving a variety of customers, each order is unique and requires a custom printed companion manual as well as verification of the manual's creation. The challenges of producing custom wheelchairs and the time pressure to provide them quickly can be daunting, which is why Quantum takes pride in its lean manufacturing process and strives to be as efficient as possible. Over time, the company's process for printing its many product manuals within its in-house printing facility had become costly and inefficient. As Quantum grew, it began to recognize the need for faster printing speeds, more dependable technology, fewer human errors, and increased accountability and traceability. Golden Business Machines (GBM) is a well-established office equipment and network services provider in Northeast Pennsylvania that has served the company alongside Canon since 1994 for its printing operations. Driven by Quantum's culture of applying lean to this challenge, GBM and Canon helped enable the company to take its lean manufacturing processes to the next level with an on-demand solution for the printed manuals.

Each Product Needs a Printed Manual

Quantum Rehab® has dedicated itself to becoming a premier global innovator of consumer-inspired complex rehab mobility technologies (i.e power wheelchairs and related technologies). In addition to delivering medical comfort, these products also enhance overall well-being, serving the entirety of users' daily living activities. Headquartered in Exeter, Pennsylvania, Quantum also has manufacturing operations in Duryea, PA; Las Vegas, NV; Canada, and throughout the world. Quantum is dedicated to providing expertly designed, engineered, and tested products that incorporate technologically innovative features so consumers can achieve their mobility goals. As a result, each product includes a manual to educate the consumer on proper product operation as well as any benefits, warnings, and specifications.

“Our customers deserve more than an online manual,” says Jay Brislin, Vice President, Quantum Rehab, “some of them don't have access to computers and so a color printed manual is important for us to provide our best service possible.”

Figure 1: Quantum Mobility Products

Due to the number of options available for each device, along with the global regions in which they are sold, there are over 200 possible combinations of manuals that might be selected to ship with the product. Not including translation requirements, each product requires an average of 6 to 8 individual manuals in addition to warranty and safety sheets. Frequent product changes also necessitate multiple updates and versions of the printed manuals—which can total up to 200 pages in length.

The Need for Speed, Less Waste, and More Accountability

For quite some time, Quantum was producing its manuals with digital printing equipment in its print shop located at its main headquarters. The manuals were printed on multiple devices to accommodate the production requirements of the manuals that were produced each day, including color printing on cover stock and black & white text pages for the inside sheets. The manuals were then sent to the manufacturing operations and then placed into bins. Up to 12 people were involved in the operation, which included placing the pages into a system consisting of over 100 bins/slots that had lights associated with each. The sorting system would select the correct manual configuration and turn on the light for that bin, and the light would be turned off after the process at that station was finished. The individual manuals would then be placed into plastic bags and paired with their associated products before being shipped to the consumer.

Figure 2: Bin System Used Prior to imagePRESS C700 Investment

According to Dan Hollock, Manufacturing Engineering Manager at Quantum Rehab, this process had become inefficient and costly over the years. He elaborates, “Company-wide and throughout the manufacturing processes for our mobility products, we take pride in our lean practices and strive to be as efficient as possible. To take next step in our lean

manufacturing process, we needed to develop a printing workflow that matched our goals to serve customers, reduce waste, and become more efficient.” Quantum was growing, and it recognized the need for faster printing speeds, more dependable technology, fewer human errors, and increased accountability and traceability.

Using Canon’s imagePRESS C700 to Fulfill Print on Demand Requirements

Hollock and his team outlined their requirements for a new print on demand production operation that included four key factors:

1. **Speed:** The manual production process needed to take 6 minutes or less from start to finish.
2. **Dependability:** The equipment needed to be reliable to minimize downtime during operations.
3. **Quality:** The quality of the physical output needed to be equal to the company’s existing standards.
4. **Finishing:** The system needed to support the binding of 150 – 200 printed pages for each product manual.

Hollock admits that he had his doubts when his team first started out with the process. He explains, “We really didn’t know what was possible. Our ideas seemed like a far-off fantasy at first, but we reached out and shared our vision with Golden Business Machines (GBM). To our surprise, GBM and Canon were able to create a solution that not only met our requirements but actually exceeded them.” The Canon imagePRESS C700 coupled with a Canon imagePRESS Server F200 powered by EFI and Powis Fastback FB20 Tape Binder meets Quantum’s speed requirements while also bringing the benefits of an automated workflow with fewer touches—thus eliminating the errors created by human intervention. To further increase efficiency, Quantum moved print production of the manuals from its print shop to the manufacturing sites when it implemented the print on demand process. Hollock states, “Our printed manuals are now created right at the end of where the product comes off our assembly line. The manuals can immediately be placed with the appropriate products on the spot, and we’ve reduced the transportation back and forth from the two buildings in Exeter.”

Figure 3: Quantum Rehab's Print Manufacturing Solution

Quantum Rehab has invested in five imagePRESS C700 devices for its printing requirements—two in its Exeter headquarters, one in Las Vegas, one in Canada, and one in its print shop. The printing facility in Exeter still prints for the company but now produces bulk manuals for overseas vendors, facilities documents, and marketing materials.

With this new workflow, the manual configurations are set up and then dropped into an EFI Fiery hot folder with a preset configuration and sequential printing to maintain the order of the books. Everything is then printed all at once on the imagePRESS C700. Each manual includes a 60lb color card stock for the cover and 20lb stock for the inside pages. The cover and text pages were previously printed on multiple devices to accommodate the different substrates and the requirement for color printing, but the entire manual can now be produced on a single device. The manuals are bound using the Powis Fastback FB20 Tape Binder, which proved to be the fastest, easiest, and most professional binder that was evaluated for this process.

Figure 4: Canon imagePRESS C700

The imagePRESS C700 was able to meet the criteria that were crucial to the success of the print on demand production project goals—timely production of the printed manuals without slowing down the manufacturing process of the mobility products that were being shipped to consumers. In addition to its ability to produce quickly with the two different stocks, the Canon imagePRESS C700 was selected because of its consistent quality and durability. According to Bob Phillips, Manager of Graphics Systems at GBM, “The products won’t ship if printing stops during the current manufacturing process. The Canon presses must be dependable, and they are routinely monitored by GBM.” The routine service also maintains the consistent quality output that the company has come to expect.

Additional Benefits from the New Workflow

In addition to increased efficiency, quality, dependability, and other print on demand benefits such as version control and reduced errors, the new workflow exposed a number of additional benefits. These included increased warehouse space, cost savings, and traceability/accountability to consumers and legal entities. The minimal footprint required by the Canon imagePRESS C700 was an added benefit to the already super-efficient workflow of the company’s manufacturing setup. This has increased warehouse space, enabling Quantum to fill it with products and accessories that wouldn’t have fit in the past. Furthermore, the company has experienced cost savings thanks to increased efficiency, a reduction in the staff/labor required to create manuals, and have lowered the cost per book from an average of \$3.80 per set to \$2.80 (using the current setup and including the cost of equipment amortized into the equation).

Finally, the company has improved its accountability by leveraging this new automated production system. Reducing the human involvement and manual intervention required using the bin system has significantly improved the accuracy and accountability of the manuals that are paired with each product. In addition, all manuals are now traceable. Hollock elaborates, “We’re dealing with medical devices, so we’ll occasionally encounter some litigation concerns from a regulatory standpoint. One of the first questions we’re asked is, ‘What manuals were sent to the user?’ It’s critical that our customers receive the most up-to-date versions of our manuals. To achieve this goal, we save an electronic carbon copy of each manual against the serial number of the matching unit.” Thanks to this new process, Quantum no longer needs to question the validity of the manuals that were sent. Everything is completely electronic and automated, so the company can confidently confirm which manuals are printed and sent. This also makes it easier for the company to provide great customer service since duplicates of lost or damaged manuals can be easily reproduced.

The Bottom Line

Thanks to an automated process for printed manuals that takes full advantage of the Canon workflow, Quantum has seen a 30% reduction in the cost of producing each set of manuals. The firm has also been able to improve its productivity without additional personnel, reduce printed waste, and increase warehouse space since manuals no longer need to be inventoried. Each of Quantum’s mobility products is now shipped with individualized, up-to-date versions of the appropriate manuals. Each manual is customized on-demand and part of the assembly process in real time for optimal shipping and handling. With this highly specialized automation, the benefit has been reduced human errors, reduced printing costs and improved efficiency. Quantum Rehab has discovered that turning to a trusted partner can pay dividends when it comes to enhancing lean manufacturing capabilities!

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[Comments or Questions?](#)

This analysis was commissioned by Canon U.S.A to identify the key value-added benefits of implementing G7 workflows into production digital color press environments. As print service providers continue to expand their offerings, Canon U.S.A. is focused on supporting their efforts through a wide range of services and workflow solutions.

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