

LIFE OF A WHEELCHAIR – WHEELCHAIR BUSINESS 101
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Ever wondered why a piece of equipment costs so much, why it takes so long to be able to get a product in for trial, or why they can't make just one little change to that part? These are all questions that clinicians and vendors have either had asked of them or have asked themselves. Products follow multiple streams between just being a great idea and becoming a functional piece of equipment in the hands of a user.

Creation of a Product

"I wish they made something that did 'X'". Products related to the world of assistive technology often have their start as a custom product that is fabricated in response to client need. After repeated fabrications, companies either look at keeping it as a special order, or consider if the return on investment warrants turning this into a standard product. Alternately, products are developed by an existing company to compliment their established equipment offerings, are based on feedback on existing products, or are developed as a technology transfer from the field of research. Regardless of what the impetus, the source of these concepts can come many different areas; engineers, designers, therapists, users, or caregivers. Cutting, welding and sewing to make a single product as a custom order is one thing. However, for it to go into production requires a 'blueprint' for design specifications. Many companies utilize CAD/CAM (computer assisted design and computer assisted manufacturing) systems to create these blueprints. This allows for initial testing of a product for strength and function, as well as providing specifications for manufacturing. Rapid prototype machines produce single components for a prototype product to exact specifications before investing in tooling and machining. While an increase in the use of technology at the design stage enables more testing and meeting exacting manufacturing standards further along, they come with a high financial investment. Once a product has been refined to the point of production, it undergoes testing; beta or functionality testing, flammability, ANSI/RESNA tests for stability and durability, and crash testing. In addition, many countries, provinces and states have their own testing standards that a product has to pass before being approved for funding in that jurisdiction.

So just how many parts does it take to make a wheelchair? A simple manual wheelchair can have around 460 parts. Of those, 40-90% do not exist in the commercial market. This means that not only does a concept have to make it off the paper, but the parts to make it actually have to be sourced or designed. It is not unusual for a \$2 part to require a \$56,000 investment in tooling to produce that part. That's a lot of parts to get return on the investment. Plastic or composite parts require that a mold be created. A \$1 million dollar mold may be able to be used for 100,000 parts, but then may need replacement. These costs do not include the cost of the man hours and associated business costs to oversee the project of sourcing, designing and compiling. A standard 'custom' configured wheelchair may take a draftsman 15 minutes to create blueprints for, or it may take 5 hours.

Once the product has made it to a production level, the next step is to market the product. This includes costs to develop marketing materials, training seminars, demo models to distributors, vendors and facilities, and tradeshow costs; booth, displays, manpower, travel, food and accommodation. How long does it take for this all to happen? It is not unusual to hear of products that take two years to complete the concept, a year and half to get to production and another year to get funding – and all these costs before a product is actually sold! In reality, the design process never stops. Products are continually being reviewed and changed based on feedback and market response. While there are as many ideas for products out there as there are people using, seeing and

thinking about wheelchairs, how many of them are practical, safe, affordable or commercially viable is open for discussion.

Getting the Product to Market

Wheelchairs start their life as raw material; flat metal stock or tubing. Pieces are cut, bent, stamped, welded, and then painted or polished. Core components are usually sub-assembled, and all parts are stocked, quality checked and catalogued. Not only does a company need to maintain a system for maintaining an inventory of parts for current manufacturing, but also has to maintain parts for products that are discontinued. Any breakdown in the supply chain can effect product availability, whether it is lean manufacturing; getting the parts just in time for assembly, or ordering large quantities of parts specifically manufactured for a particular product.

A prototype may be the design of a single person. When a product is in production however, space, manpower and training have to be in place to assemble a product and pass quality control standards. Once a product is ready, it is shipped to a dealer. This requires costs for shipping, handling, customs/duty and brokerage fees to cross borders, not to mention the cost of actual packaging and the person to do it. None of these activities happen in a vacuum. Behind the actual product production is the customer service, order entry, purchasing, accounting, and human resources to support a company. These manufacturing and support costs are there whether production is for 100 items or 1 million items. The difference is how widely the costs can be offset; the more items, the less overhead cost per item.

Getting the Product to the Client

In order for a product to be sold to a client, the vendor is the final step in the manufacturing stream. Where do you start to calculate the cost of doing business; rent, office and mechanical fixtures, insurance, hydro, water, taxes, vehicles – and that's before even putting a single product in the building. Additional costs include vehicle, service technicians, education and training, tradeshow, promotional products, travel, sponsorships, marketing materials and sales staff. While it may not require parts to adjust a chair or provide warranty service, just how much does it cost to put that vehicle and driver on the road?

Each company has their own system to stream a product through their company. However, the same basic functions need to be carried out; sales, purchasing, receiving, accounts payable, technical support/assembly, QA check, delivery and fitting, customer service and accounts receivable. The sales rep is point of entry of a new product and getting it known by therapists and clients. Their product knowledge, ability to match to client need and translate into a quotation and blueprint for a functional system is key in the prescription process. However, just as important is the ability for a company to manage the flow of products. The company will be invoiced for the product when it is shipped by the manufacturer, but usually cannot bill the client until the product has been dispensed. Where a prescription requires products from multiple manufacturers with differing timelines, this may become a logistical challenge to coordinate. Failure to pay an invoice may mean that no new orders can be placed with that manufacturer.

Once all the products for an order have reached the vendor, they need to be assembled. While the manufacturer trains staff to build specific products, the vendor staff must be able to take the assembled components from multiple manufacturers and integrate them together. The multitude of manufacturer's products also presents the vendor the challenge of how much inventory to have on hand for sale, as well as purchase for demonstration, trial and rental. While the utility of manufacturer or distributor samples many eliminate this need, it introduces an element of time delay, and the cost of shipping the equipment back and forth.

The Client's Journey

The final stream in the life of a product is that of the client. While every province, state, health trust or funding agency has their own set of guidelines and rules, there is still a basic flow to the equipment acquisition process; identification of need, referral and assessment, trial of equipment, prescription, funding, delivery and fitting of equipment. The involvement of a therapist could be a single visit or multiple appointments, could be facility or community based, and could be government funded or private pay. Regardless, the client is faced with finding an appropriate professional and may be faced with wait lists. Clients who have been long standing users often have their own stories to tell about amazing service as well as nightmares of mistrust and incompetence. Every professional and vendor has their own skill set. Coordinating the who, what, where and when for the appropriate people and equipment for assessments, trials and fabrication can be a logistical feat. While we expect to be able to take a car for a test drive before buying, how long is it appropriate to have a piece of equipment to be able to determine if it will be suitable, and how many different models need to be trialed? During the time that it takes from assessment to delivery, it is not uncommon for a person to have medical or functional changes. All these factors add to enhance or sometimes confuse the equipment acquisition process.

They say that 'it takes a village to raise a child'. A variation on that theme would be that 'it takes a whole team to get a product to a client'; concept to product, product to market and market to client.

Speaker Bios

Stefanie Laurence is an Occupational Therapist who has been working with people with special needs and their assistive technology in a variety of settings for the past 27 years. Stefanie is the Education Manager for the Motion Group of VGM Canada, and in this role maintains active involvement in the area of custom seating and high end technology. Stefanie publishes and presents across North America at conferences, universities and colleges and is a member of the planning committee for the Canadian Seating & Mobility Conference. Stefanie can be reached at slaurence@themotiongroup.com.

Jane Fontein, OT, has been an Occupational therapist for over twenty years, working in a variety of areas including long-term care and rehab, as a manufacturer educator and as a supplier. She worked at GF Strong Rehab Centre on the spinal cord unit and coordinated the outpatient seating program. For several years Jane provided education seminars and in-services across North America for wheelchair cushion Manufactures. She has spoken at the International Seating Symposium on several occasions as well as RESNA and the Canadian Seating & Mobility Conference. Jane is the Clinical Specialist for PDG, providing education seminars across North America. Jane can be reached at jfontein@pdgmobility.com.