AT2030
Innovation Insights

An AT Innovator case study: Amparo

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Highlights

- Amparo is a prosthetics company which aims to create lower-limb sockets which are easy to fit, remouldable, and cost effective over the long term.

- The company started out in LMIC markets but struggled to develop their product and attract investment whilst being based out of Berlin. Amparo pivoted to establish a sustainable business in their home location of Germany first. They are now re-entering LMICs.

- To get to where they are now, Amparo have had to learn the right approach for manufacturing and product development, selling to sceptical customers, and team restructuring.

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Summary

In this innovation insight paper, we interviewed Lucas Paes de Melo, the CEO of Amparo, to discuss the journey so far of prosthetics company, Amparo. Rather than focus on the product, this insights paper provides an honest reflection of the journey to establishing an assistive technology company and delves into transferable insights. In doing so, we aim to provide insights to help current and future AT entrepreneurs to see behind the curtain of working in this space.

Introduction

Over time, prosthetic components such as the liner and socket will need to be replaced, either due to wear and tear or the changing shape of a person's residual limb [1]. Frequent socket replacement is especially common in the earliest stages of becoming a prosthesis wearer [2], as the residual limb shrinks and stabilises over the first few years of prosthesis wear. Prosthetic service delivery models, therefore, need to be set up for the initial prescription process, and the continued needs of maintenance and adaption. In Low-to-middle income countries (LMICs), scarce resources, limited-service delivery locations and a lack of trained experts make the delivery and continued maintenance of prosthetics challenging [3]. The resources and expertise to fit a socket and prosthesis, service centres which are few and far between, and costs to the end wearer mean that approximately only 5-15% of people who need a prosthesis in LMICs have access to one [4].

Amparo GmbH

One company who formed to make prosthetics more affordable, accessible and easier to fit is the Berlin-based startup Amparo. The company's leading innovation is a mouldable prosthetic socket which prosthetists can reshape multiple times to fit a wearer's residual limbs as they naturally change shape. However, because the socket does not require a hand-crafted process, fitting sockets can become easier than plaster-casting, which is the industry standard for socket fitting.

Felix (COO), Lucas (CEO), and Wesley (CTO)

Amparo started in 2014 as a university project, where the goal was to create a better solution for people who need lower-limb prosthetics. However, despite being based in Berlin, the founders of Amparo were motivated to research prosthetics in LMICs. Using a design-thinking approach, the team started by visiting prosthetics clinics and spoke to prosthetists and prosthesis wearers in South Africa to understand their needs. In doing so, they came up with the idea for an easy to fit, durable and mouldable socket. They believe a socket which can meet these needs would be able to address the demands of prosthesis prescription in low-resource healthcare systems.

Figure – Wesley fitting a Confidence Socket in Kenya, working with local prosthesis wearers and clinicians.

Since 2014, the company has been committed to speaking to prosthesis wearers and prosthetists across the world, working in South Africa, Brazil, Kenya, Berlin, and other European locations. Amparo has sought to understand and improve their product, adopting a user-first approach, whilst still maintaining rigorous research and testing standards. Their flagship product- the Confidence Socket, has now had product sales into the thousands, with the majority of sales being to German and European customers. Recently, they have been able to circle-back to their initial market and have established a non-profit called Amparo Access, which seeks to provide prosthetics to people in LMICs.

Pivoting to a home market

As an organisation, the desire to make a difference to individuals in LMIC contexts has always been an important motivation for Amparo – working in LMICs led to the idea for mouldable sockets. However, as a business which based the majority of its operations and product research, development and manufacture out of Berlin, discussions with investors were challenging. Investors were usually impressed with the good intentions of the company and the product but were not prepared to invest. Investors saw a disconnect between the organisation being based in Berlin but trying to sell in LMICs. Additionally, at that point in time, Amparo did not have an established trading entity to sell in these regions and had minimal connections or local knowledge in South Africa or Kenya, their initial target markets. Finally, Berlin-based investors wanted to see their capital put towards helping people who were closer to home. If Amparo stuck to their initial strategy, securing investment would likely have been incredibly difficult. To overcome the barrier of lack of investor appetite, Amparo decided to look for a relevant use case for their product in their home market.

"it was actually after going to Brazil and doing a lot of tests there that a big insight came to us that this product will be extremely good not only for amputees in low-income countries but for recent amputees from developed countries".

Re-shapable sockets are also useful for early-stage prosthesis wearers in higher resource countries. The insight, that the Confidence Socket could be suitable for a market segment much closer to home meant that Amparo could focus efforts on

establishing themselves in the EU as a priority. This 'local first' approach meant that they were able to secure the required investment to support their product development efforts. At present, Amparo has a growing client book of European customers, a defined service offering, a validated product and a repeatable manufacturing process. Lucas was keen to point out that there is always room for continued improvement, however.

"we understood pretty early that to help people, we have to help ourselves first, if people here in developed countries want it, then let's sell it to them first, then we structure ourselves and get costs down, we can go to the places that we want to…and it's taking a long time – that is frustrating".

Amparo GmbH has recently made progress towards re-entering LMICs through establishing a non-profit arm of the business called Amparo Access. Using the refined product, accumulated learnings, and connections with organisations such as GDI Hub and the AT2030 network, they are refocussing to provide prosthetics to people in LMICs. The for-profit and non-profit structure mean that the established for-profit business can invest in refining existing products and developing new products and services. The non-profit side of the brand, therefore, does not need to invest in technologies development because it can use Amparo GmbH technology. Therefore, Amparo Access will maximise the use of philanthropic funding to get their products to people who need them most in LMICs.

The take-home insight is **not** that AT should be created and grown internationally before being brought to an LMIC market. The many notable AT companies which are local to LMICs which are on a path to scale are evidence that this would be a false narrative. The insight is more nuanced; for internationally based companies seeking to create products for LMICs, to satisfy investment needs, you may have to focus on a home market first. The 'home-first' approach still requires deep understanding of the needs of users in both locations to uncover universal problems to create applicable products. However, once the business has become established, reaching an LMIC target user can be more realistic.

The reality of sales in prosthetics

Focussing on a home market may have made investor discussions easier. Still, it did not make selling to European customers easy. For many AT products, the clinical pathway to access still remains common, or even essential to ensuring the right product reaches the end-user, and the user can achieve their maximum potential whilst staying safe. Therefore, when Amparo sells products in this style of environment, they have needed to adapt to a high touch sales strategy. Typically, the sales process can take multiple months from the first contact to the first sale. During this time, Amparo will usually meet prosthetic technicians, prosthetists and administrative staff to discuss the product, the service model, cost benefits, training requirements, and safety aspects. However, one of the most impactful approaches in the sale process has been to host product training and service demonstration

workshops. A hands-on sales experience enables the Amparo team to mitigate any scepticism with Amparo's novel product and socket fitting process.

The reason for being apprehensive of new products is understandable; prosthetists and prosthetic clinics always need to ensure that all products are safe and of good quality. For innovators creating AT products, it is wise to design a sales strategy which provides customers' the opportunity to see, touch and trial the product or service which you are creating. In creating a hands-on sales strategy, companies must also remember that there are a range of stakeholders who are not always the end user, and each stakeholder will have their own set of priorities which must be addressed. A trust-building process is critical to building enough confidence for clinicians to be willing to adopt and prescribe products.

The 'good-enough' fallacy

In the early stages of developing their product and while the company was still focussing on LMICs, Amparo sought to gain clinical feedback from prosthetics experts working in Europe. By their admission, the early confidence socket prototypes were relatively crude and still required additional refinement to be launchable in the broader market. What surprised Amparo was that some people would say the product was not ready for higher-income countries, but good enough for low-resource settings:

"I heard from CPOs and sometimes when we were doing testing, and they'd look at the technology – and it was not as pretty as

today- and they'd say, well you could still sell this in developing countries…"

The attitude that low-resource countries will be receptive to lower quality products is an unfortunate hangover from a history of low-cost, low-quality products. AT products designed for LMICs may have to encounter challenging terrains or have need to last longer. Low-quality products in demanding environments were therefore rarely successful, resulting in broken and abandoned products. For companies committed to creating high-quality products for LMIC settings, obtaining constructive feedback when developing AT can be challenging when encountering preconceived notions of what 'good' looks like in these contexts.

Founders of AT companies which serve the needs of AT users in lower-income countries should be aware of preconceptions, and also be aware that they have the potential to change attitudes. The world needs to see high-quality, rigorously tested, and well-made products reaching and meeting the needs of people in LMICs. Responsible founders should be committed to such a change.

In-house manufacturing

Conventional wisdom usually dictates that companies who are making new products will typically outsource their manufacturing process. A contract manufacturing approach has two advantages. Specialist manufacturers will already have the machinery to make the new product, and manufacturers will already know how best

to make products. A reduction in upfront costs and a lower knowledge burden typically reduce the barrier of getting products made and launched on the market. However, Amparo decided to stick to internal manufacturing. Whilst this has meant that Amparo has needed to purchase their own equipment, their hands-on approach to manufacturing has had many benefits. Their product innovation relies on a mixture of innovative materials, production, and novel service delivery. Therefore, keeping the process in-house has meant the company has been able to continually iterate the socket.

"We are constantly working to make the manufacturing process faster and scalable so that we can bring the costs down"

If they stuck to a conventional approach of outsourced manufacturing, this 'learning-through-making' approach would have been prohibitively costly. As a result, Amparo's manufacturing process and know-how form a valuable component of the company's intellectual property. Given that prosthetics is an industry which has to date been dominated by a handful of large brands, this protection makes their mouldable socket a hard to copy product innovation. Taking product manufacturing in-house will not be right for every company. Still, Amparo shows how it can be the right decision for those brave enough to redesign multiple points of the conventional product, and to consider how service delivery and training can be adapted to challenging environments like those which are frequently found in LMICs.

The importance of team dynamics

Investors will frequently say that whilst the product and problem space are important parts of a business, in the earliest stages, the knowledge, skillset and reputation of a founding team are almost more important. However, team dynamics are often neglected. In the case of Amparo, when discussing the earliest stages of operating, one of the most challenging aspects of the business which nearly resulted in the closure of Amparo was team dynamics:

"We weren't always the three of us [Lucas (CEO), Wesley (CTO) and Felix (COO)], and before that, we had a lot of conflicts…, it was more like the daily approach to activities, challenges, problems and teamwork. It was just not flowing, so that made us almost not want to keep going"

To resolve their issues within the founding team, they undertook a painful restructuring of the team:

"Sometimes maybe you have a great product and motivation, but if the team interaction sucks… you have to restructure. It's gonna hurt, and it's going to hurt everyone, but you have to do it"

In Lucas' experience, even though they tried many different ways to resolve differences within the team, if they had not restructured, the company would have failed. For founders who are experiencing issues in team dynamics, it is important to try first to resolve issues. However, it is just as important to make tough decisions like restructuring; the future growth of an early-stage company depends on it.

Summary

For Amparo to get to where it is today, the journey has been challenging. To get their socket technology to where it is today, they have had to take the difficult path of keeping manufacturing and product research and development as close to home as possible. Flying against the conventional wisdom of external manufacturing has meant a steep learning curve, many painful mistakes, and the burden of upfront costs. However, to create a socket which is fitted in an entirely new way compared to the industry standard and to use a highly customised material, the difficult path was the right one to take.

In the words of Lucas, aside from product development, the need to reprioritise their focus from LMICs to western markets was frustrating but necessary. The company has ironed out many of the flaws with the early product and secured sales and investment to stabilise the business. They can now re-enter the market which they originally intended to impact using a non-profit Amparo Access, alongside Amparo GmbH. For other founders who are motivated by creating products for LMICs, but who are not based in or from LMICs, it may be necessary to consider a similar approach. However, it is important to highlight that Amparo's product is universally relevant because they have collected deep user insights from people in LMICs and their home operating geography. If they had just focussed on insights from Berlin-based prosthesis wearers, they would likely have developed a technology which was not relevant to prosthesis wearers in lower-resource settings.

In the initial phases of product development, the product team often received feedback that they could 'get away' with lower-quality product because they were trying to reach end-users in LMICs. The team at Amparo have found these preconceptions to be frustrating and unhelpful. Additionally, when introducing the product to people as being targeted to low-resource settings, some people have attributed their own preconceptions that AT products for low-resource setting are lower quality and applied them to the Amparo product. To counteract these preconceptions Amparo GmbH's branding now does not indicate their origin story upfront. However, employees of the company proudly share their journey from a South African, Brazilian and Kenyan inspired product, to a business selling to a European audience. Through in-person discussions, they have positively changed peoples preconceived expectations of AT in LMICs. Negative preconceptions which some people may hold in relation to assistive technologies in LMICs are uncomfortable to encounter. Aside from being ethically unconscionable, they represent a barrier for businesses in AT. Therefore, stakeholders in assistive technologies and AT innovation ecosystems should always ensure that outdated preconceptions such as the one described here are changed.

Finally, through all of the challenges with finding the right market, investors, and developing the product, one of the most painful challenges for Amparo was reshaping the team to find the right combination of knowledge and the right team chemistry. The progress to date has been possible because they now have an aligned team which can continue to grow and progress the business. The company is now at an exciting juncture as it seeks to re-enter the LMIC market with a corporate

structure which allows them to. The company continues to explore and develop new product ranges and partnerships to scale up their impact.

Insights

- For international startups who want to make a difference in LMICs, you may have to start in your local region and then return to LMICs when your business is stable, and your product is appropriately developed.
- Innovative products and services in prosthetics may require a high-touch sales process which reaches multiple stakeholders. Product demonstrations and samples can make a meaningful difference.
- The 'good-enough' fallacy can still be present when looking to make AT for LMICs. Preconceptions therefore can make obtaining objective product and business feedback challenging.
- Keeping manufacturing as an internal process can help you iterate your product faster and add value to your business in terms of IP- but it won't make your life easy.
- It isn't just about the skills of the team; team dynamics are crucial. If the team dynamics aren't right, taking the painful decision to restructure may be the only way forward.

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