One Page Business Overview for The Other Realm Date: 2023-08-09

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| Customer |
| *(In order of rollout,****bold*** *is current target)*   * **End consumers with abnormal gait 🡪** –MVP is small scale, largely manual constructed shoe, primarily for people with hemiparesis * Anyone who wants their own, unique style * Therapy clinics * Shoe stores |
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| Competition/Collaboration |
| * There is a large number of shoe manufactures, obviously, and many (Nike, Adidas, etc.), have 3D printed shoes with some customization options already on the market * However, few if any, are not in the medical sector or intended for people with gait concerns and the extent to their customization is still very limited. * There are brace manufactures (ex. Hanger), but they are largely starting with existing shoes and building awkward braces to fit them that restrict foot control and therefore balance * By working with existing clinics and stores, develop a partnership where they do the fitting and we do the tech * [Research done by my participation in the I-Corp program in the spring of 2022](https://github.com/orgs/other-realm/projects/2/views/1?pane=issue&itemId=27063924) * Look into whether it makes sense to partner with the Footwear Distributors & Retailers of America (FDRA). |
| Governance/HR |
| * See: <https://www.otherrealm.org/governance> * Generally, the plan is to be highly heterarchically collaborative and all share in the joys and pains of starting a business |

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| Income Structure |
| *(Very rough numbers; for MVP)*   * Initially the price will probably be in the $150-350 range * While on the high end of the average shoe, almost all somewhat *custom* shoes are at least double that, and for truly one-off, in the range of 10x that. * Once the manufacturing process has begun to be optimized and automated, the price will almost certainly go down as the quantity produced goes up. * Once initially operational, Expected 10-30 shoes a day (Work 5 D/W) to begin with, $100 profit per shoe, $1000-$3000/day; 50-150 shoes a week, $5000-15,000/week; ~$260,000-$780,000/year |
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| Expenses |
| * Land/manufacturing space $400,000-$1,000,000+ – one time * Machines (3D printers, etc.): $100,000-$1,000,000/ one time * Payroll $70K-$100K per 3-6peo. $210K to $600K/Year total * Material costs, likely $25~75/item, accounted for in the income section * Utilities-$1000-$2000/m;$12K-$24K/Year * Testing equipment - $5k-50k/one time * Other reoccurring expense are likely to consist of legal fees, taxes, partnership payouts, marketing, shop upkeep ~$25K-$50K/Year |

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| Products |
| * 3D Printed Custom Shoes * A system to make the design of said shoes simple and intuitive and as fast a turnaround time as possible (The goal is for someone to be able to go in, have their foot and gait recorded, & walk out with a new pair of shoes the same day) * Adaptive material that can programmatically change form through targeted excitation (solenoidal, thermal, mechanical, ex.), enabling dynamic mold making and a range of other uses |
| Initial Steps |
| Complete:   * [Create a basic proof-of-principle 3D printed shoe](https://github.com/orgs/other-realm/projects/2/views/1?pane=issue&itemId=24949757) * [Create a not-really-parametric CAD model of a shoe, for 3D printing, in Blender](https://github.com/orgs/other-realm/projects/2/views/1?pane=issue&itemId=24952479) * [Create a concept drawing CAD model of a shoe for 3D printing in Blender](https://github.com/orgs/other-realm/projects/2/views/1?pane=issue&itemId=24952546)   In Progress:   * [Experiment with expanding foam in molds](https://github.com/orgs/other-realm/projects/2/views/1?pane=issue&itemId=25033920) * [Create a parametric CAD model of a shoe that can take an array of values as input and output a custom design](https://github.com/orgs/other-realm/projects/2/views/1?pane=issue&itemId=24800246) * [An Arduino sole pressure distribution mapping system](An%20Arduino%20sole%20pressure%20distribution%20mapping%20system) * [Model hemiparetic gait in OpenSim](https://github.com/orgs/other-realm/projects/2/views/1?pane=issue&itemId=24804184) * [Exploring Sustainable Materials](https://github.com/orgs/other-realm/projects/2/views/1?pane=issue&itemId=27076032)   Have not started:   * [Create a parabolic mobile phone video camera gantry setup that can scan feet in 3D](https://github.com/orgs/other-realm/projects/2/views/1?pane=issue&itemId=24801658) * [Experiment with foot molding and glue attachment to 3D printed 2-part sole](https://github.com/orgs/other-realm/projects/2/views/1?pane=issue&itemId=35767347) * [Experiment with ways of precisely controlling material expansion for use in dynamic molds](https://github.com/orgs/other-realm/projects/2/views/1?pane=issue&itemId=35949915) |
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| Manufacturing Process |
| * Start by getting the dimensions of the foot and the gait characteristics of the wearer using a combination mobile app ([OpenCap](https://www.opencap.ai/)/other/custom made) for gait and manual measurements for foot dimensions * Enter these parameters into the software we developed. This will produce a CAD model * Load this model into the 3D printing slicer, export, and print. This will produce (at least) the outsole and upper support (any 'brace-like' qualities) * Combine the printed parts with non-printed parts (ex. laces, eyelet grommets, fabric in upper, etc.) via sewn parts attached with glue in the middle of the outsole and the insole   This whole process will eventually be largely automated, but start out with some manual tasks |
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| Needed Resources |
| * Access to a chemistry/material testing lab and training in its use * Access to a gait lab * More knowledge around precise control of electrically/thermally induced material expansion/contraction for use in dynamic mold forming and soft robotics * Funding for the purchase of raw materials for testing * Funding to be able to work on this full time and to pay anyone else who joins the project * More people with both a need for custom footwear and the interest/capacity to take on some aspect of the development process |