SEAMLESS

A MODEL FOR CORPORATE AND STARTUP ENGAGEMENT

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June 2020

Executive Summary

This work explores a novel model for bringing startups and large enterprises together in the Midwest. The Grand Rapids, MI region has a history of design for the built environment and is home to multiple multinational corporations, as well as a growing startup ecosystem. Five years ago, the Seamless Consortium was formed as a means for enterprises to work together collaboratively to reduce the traditional barriers for engagement with early stage technology startups. Today, located in the heart of Grand Rapids, Seamless has evolved into a unique platform comprised of enterprise members, representing non-competing industry verticals, that work together to explore forward-looking themes, ripe for innovation. Based on this, Seamless scouts and screens promising technology-based startups and, where a startup aligns with the interests of multiple members, Seamless works with a subset of their members to design, execute and evaluate a proof of concept (PoC) prototype. Seamless manages the engagement, with a lightweight legal framework and fast funding, and disseminates the learnings within the consortium.

These co-development exercises lower the transaction costs typical to such experimentation for both enterprises and startups. The Seamless platform, with a process to identify collective themes of interest, worldwide scouting and the ability to combine the insight from different enterprises' innovation teams, serves as an effective filter. Then Seamless addresses the impedance mismatch that arises when a startup tries to handshake with a large entity, facilitating highly efficient PoCs. The result is multi-directional learning, with information transfer between all parties. Startups access deep physical, technical and market expertise resources and explore the challenges of integrating their technology into seasoned enterprise products. This has helped startups to sharpen their technical roadmaps and business plans. The enterprises collectively gain early access to information on emerging technology areas and the founders' diverse perspectives.

The Seamless model presents a complimentary way to leverage both the deep expertise of enterprises and the flexibility of startups, but there are significant opportunities for members to further grow and leverage the program: Firstly, with its comprehensive understanding of startups' evolution, Seamless has the opportunity to develop into a venture capital fund that provides enterprises a way to take stakes in promising startups as they grow beyond PoCs. Secondly, with its success in PoC design and execution, Seamless and its members can continue in an active role, as an acceleration and mentoring platform. They can continue to support follow-on engagements with enterprise partners and, independently, facilitate continued connectivity. Thirdly, with its deep experience and access to information, Seamless has the potential to develop into an organization that takes a more proactive role in driving enterprises' innovation strategies and deepening engagements with early stage startups that are addressing the intersection points of industries. Lastly, Seamless has the potential to help its members take a strategic approach to improving economic inclusiveness in their organizations and the region.

In summary, Seamless presents a novel, flexible vehicle for corporate – startup interaction that is worth further growing in Grand Rapids as well as studying and adapting for other regions globally.

This work was supported by Seamless.

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The Authors would like to acknowledge the Seamless team, especially Mike Morin, Matt Benson and Kaylee Page, for welcoming us to Grand Rapids and for their candor. We are also grateful to the enterprises and startups who shared their experiences.

Thank you.

Photo: Seamless Weekly Meeting

Introduction

This report presents material gathered by the authors over two separate visits to Grand Rapids: an introductory visit in December 2019 and focused week in March 2020, during which over 30 hours of interviews were conducted, both in person and by video conference. These interviews with the Seamless core team, representatives from the 8 current member companies and leaders from 10 startups, sought to understand the history, evolution, structure and operating modality of Seamless and identify the key enabling elements of the Seamless ecosystem. With this as context, the authors dug into the specifics of the enterprise – startup engagement, from identification of themes, to execution of proof of concept (PoC) experiments, to follow-up. Select case studies that exemplify the structure of engagements are detailed. This report presents constructs derived from the analysis of this research, summarizes the strengths and current challenges of the Seamless model and outlines opportunities for continued development over the next five years.

30 HOURS

10 STARTUPS

8 COMPANIES

History

In the late 19th Century the United States' timber industry was booming, with the Grand River delivering logs to the sawmills and furniture makers of Grand Rapids, Michigan. The region came to be recognized as "America's Furniture City" and today the tradition of design innovation lives on. With a city population of 200K and a regional population of 1.5M, Grand Rapids is home to a surprising number of multinational companies, key corporate innovation teams and specialty suppliers. This density fosters cross-organizational relationships, which include the technical and business communities, that are characterized by a high degree of trust and a willingness to build and grow enterprises. This history and current design-focused innovation community served as a catalyst for an experiment in large enterprise – startup engagement, the Seamless consortium.

Start Garden

Seamless has its roots in Start Garden, which was launched in 2011 by Richard "Rick" DeVos III, grandson of Amway Inc.'s founder. He sought to bring together people and activities to foster an entrepreneurial culture in the region and counter the exodus of talent towards Silicon Valley and the East Coast. Start Garden LLC was capitalized with a $15M investment from the DeVos family and operated out of a storefront in the heart of Grand Rapids, with a hybrid model of both convening and funding.

Start Garden launched a website that solicited ideas from the public. Each week one idea was selected by public vote and one by the Start Garden team to receive $5K in funding. Recipients then had 60 days to develop a low fidelity prototype, with no strings other than a lightweight options agreement with the right of refusal for further investment. Subsequently, budding entrepreneurs competed for a $20K investment, awarded each month based on criteria including feasibility, desirability and scalability. These investments were made in the form of convertible notes, with a simple 5-page agreement. Further investments were made directly by the fund. Quick deployment of seed funding and straightforward paperwork remains an attractive aspect of Seamless. Over the next two years, approximately 300 grants were given and 60 pre-seed companies were invested in, for a total of $11M under management, with the remainder of $4M supporting ecosystem development.

Start Garden's events regularly attracted ~200 people from West Michigan. Among the attendees were representatives from many local companies, including members of the innovation teams at Steelcase, Faurecia and Amway, companies that also helped sponsor Start Garden's operations. These innovation leaders, who were already tasked with scouting new technologies, together with the Start Garden team recognized that the opportunity for deeper, more meaningful engagements between large enterprises and startups existed if the impedance mismatch, due to their different scales, timelines and operating modalities, could be bridged.

In 2014, Seamless IoT was launched to further strengthen the ecosystem development efforts. Later, in 2016, Start Garden was reorganized to separate the ecosystem development from the venture fund, with Start Garden becoming a Michigan nonprofit (later a 501c) focused on startup support and the investment moving under the auspices of Wakestream Ventures. Currently, Seamless operates in a non-profit format as an independent program under Start Garden. Together they share a floor of the historic Romanesque Revival styled, Trust Building, in the heart of Downtown Grand Rapids.

Motivation for Seamless

A precursor to understanding the importance of Seamless is recognizing the significant impedance mismatch between startups and enterprises: Startups understand *lean and agile* while enterprises understand *quality at scale*.

Small companies that launched to solve specific problems, over time become large enterprises focused on cost, quantity and quarterly returns. Strategic plans seek to maintain and capture market shares, where the revenues are measured in hundreds of millions of dollars. As an example, Whirlpool, a Seamless member, began motorizing washing machines in 1911 with a $5K investment ($135K in 2020 dollars). Today it has 100K employees, does over $20B business annually and recently bought an Italian appliance manufacturer for $1B. This scale of enterprise and magnitude of numbers lead, naturally, to a conservative approach, whereby internal innovation teams find it challenging to start and maintain small, exploratory projects that do not comply with the established processes. Typically, they focus on scaling products and meeting financial ROI expectations.

This was not always the case, but it is the reality today. According to "The Changing Structure of American Innovation" from the University of Chicago Press[1], since the 1980's pressure from Wall Street has led to a decline in once robust corporate research labs, which focused on long term, but mission-driven research, as distinct from curiosity-driven academic research. With the demise of great names such a Xerox PARC and Bell Labs[2], the bulk of early stage innovation has shifted to universities and startups. These do not have ready access to the deep financial resources and the direct practical knowledge and focus on commercial scaling for multiple markets that is core to large enterprises.

Enterprises do continue to recognize a need to keep up with the ever-evolving technology landscapes and respond to potentially disruptive threats emerging outside their present business areas. Addressing this is the goal of "open innovation" initiatives, which take many forms, including scouting for academic research, posting "challenges[3]," sponsoring startup events and programs[4] and corporate venturing.

In contrast with enterprises, startups have permission to break the rules, accept high levels of risk and run lean and learn fast. Each funding round, typically on the order of millions, provides only 6 – 24 months' runway and reduces founders' equity, therefore, startups look for a capital efficient means to achieve early validation and market traction. With a typical focus on a single product, development cycles occur on the order of weeks or months. Founders work long hours and manage internal competition for dollars to build prototypes, file IP, develop the business and pay salaries.

Bringing together enterprises and startups poses multiple challenges: For enterprises, the number of startups to evaluate is bewildering and the failure rates among those that launch successfully is commonly quoted as 50% in four years. Enterprises typically evaluate new technologies as a license opportunity, potential supplier or an acquisition target, while most startups at the Series A or even B stage are still developing and validating their technology and honing their business plan. Even finding the right points of contact in a large company is challenging and, quoting one enterprise lead, "Doing business with a large corporation is like shaking hands with an octopus." Both parties have concerns about sharing information and the potential co-mingling of IP. Many enterprises take a "watchful waiting" approach and when startups engage, but without concrete results or next steps, startups can feel that they have wasted time on a "window shopper."

Nevertheless, startups' founders and enterprises' innovation leaders do recognize the potential benefits of earlier collaboration, but often lack a structure and mechanism to enable engagement.

[1] A. Arora, S. Belenzon, A. Patacconi, J. Suh, "The Changing Structure of American Innovation: Some Cautionary Remarks for Economic Growth" in: Innovation Policy and the Economy, J. Lerner and S. Stern, editors, December 2019, University of Chicago Press, pp. 39 – 93.
[2] Author Chintan Vaishnav worked for Bell Labs before joining MIT's Technology and Policy Program.
[3] This was pioneered by Eli Lilly and spun off as InnoCentive, Inc., an open innovation and crowdsourcing company.
[4] MassChallenge, the world's biggest business competition, and Greentown Labs, the largest clean technology incubator in North America, rely heavily on corporate sponsorship.

Seamless' Vision

The Seamless consortium launched in early 2015, with the vision of a new model of enterprise – startup engagement: Multiple large enterprises would work together, in a non-competitive format, to craft engagements with startups working in "white space" areas that intersected the enterprises' interests. Startups would explore multiple industry verticals, the enterprises would spread the cost and risk of engaging with startups and both groups would share the learnings. While traditional scouting looks for plug-in solutions that serve or grow existing businesses, Seamless has freedom to look for startups that blur the line between industries, services and products, physical and digital, and public and private. Seamless provides a way for "enterprises to move at start-up speed," according to Mike Morin, a founding Director. Furthermore, it is a "a tool for innovators within companies to get stuff done," in ways that would not be feasible within their organizations, according to Matt Benson who joined Seamless, as the second Director, from Faurecia. Seamless provides startups with a single point of contact that enables engagement with multiple enterprises.

A key underlying principle, which Mike calls the "Midwest Way," is a focus on approaching problems iteratively and collaboratively through experiments, with more modest expectations than Silicon Valley. This is enabled by the Grand Rapids region's "design thinking" heritage, small scale, confluence of multinational corporations and the formal[5] and informal[6] relationships that serve as bridges.

Seamless IoT & Accelerator

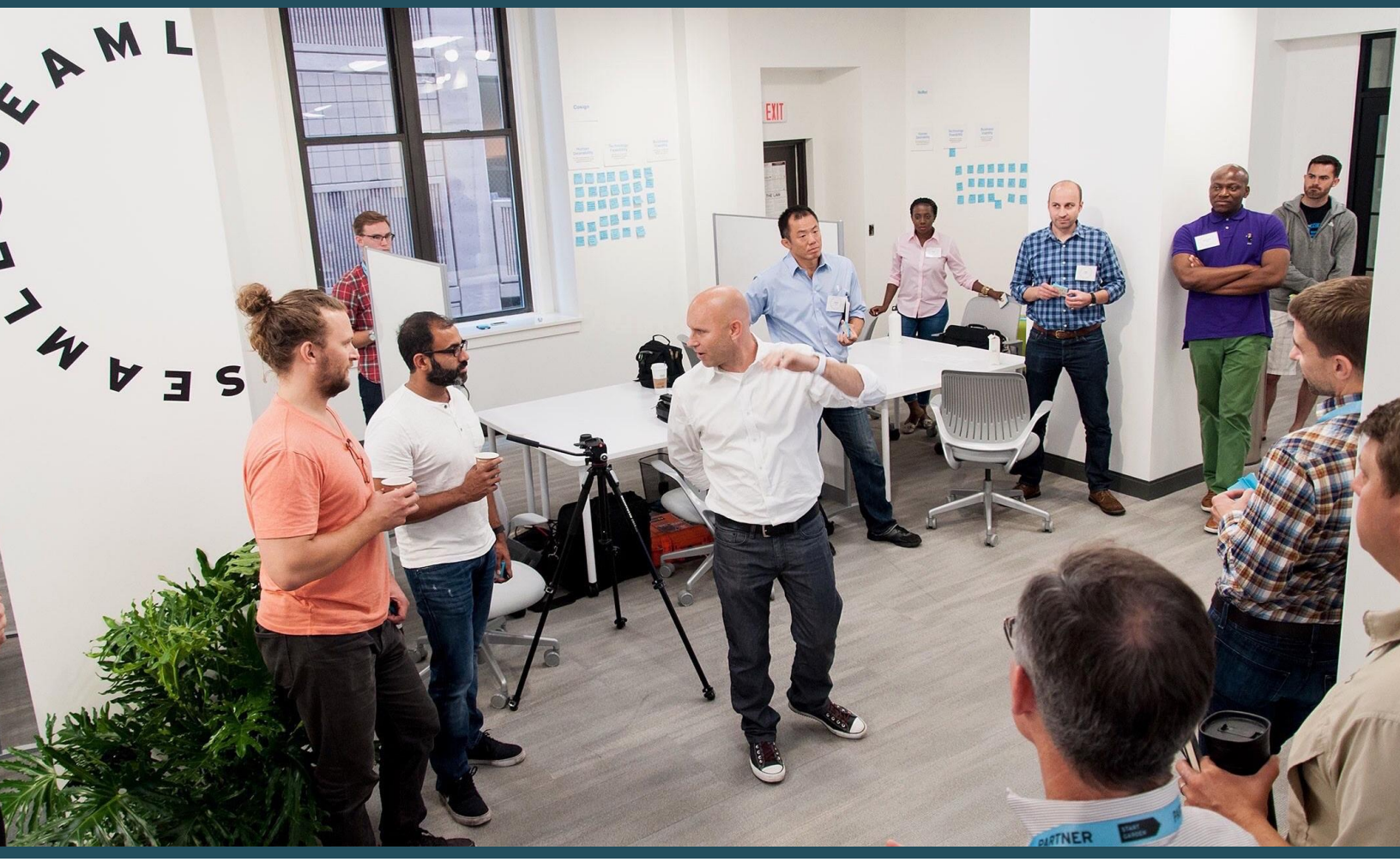
"Seamless IoT is a US commercialization program designed to create deep interaction between start-ups and world class enterprises to help validate and commercialize Internet of Things technologies."

In its first incarnation, Seamless focused on identifying opportunities in the Internet of Things (IoT) space. The enterprise members, with traditional product and service business models, struggled to understand the implications of IoT on their business and find entrées into the space, hence this was well suited to an "open innovation" approach. Following a traditional accelerator model, similar to Tech Stars and YCombinator, during 2015 and 2016 three cohorts of 8 to 10 startups each were recruited to 12-week residency programs in Grand Rapids and each received $20K seed investments, split between Wakestream and the Seamless Accelerator Venture Capital Fund. The pitch to startups was the opportunity to "work side by side with global enterprises to test and validate their technologies across multiple verticals in home, workplace, healthcare, transportation and retail." They were offered access to enterprises with global supply chains and established markets as well as mentors, strategic investors, customers and seed capital. Each startup was assigned to a Seamless member as well as a local company, such as a design firm, to help them develop their prototype. Startups came from across the US and the world and the program is credited with over $4M in direct investment enterprises members and Wakestream.

After two years, it was apparent that the one-size-fits-all, highly structured accelerator approach was not a good fit for the more mature startups, with a strong team, established technologies and initial validation, exactly the type that are most of interest to corporations. Moreover, the focus on connected technologies was unnecessarily constrictive. Therefore, Seamless dropped the "IoT" nomenclature, expanded the scope of scouting and, today, executes only customized engagements.

[5] Prior to Seamless, Steelcase, a manufacturer of office furniture, already collaborated with Faurecia, a manufacturer of automotive interiors, to investigate trends in seating.

[6] There is a regular movement of people between firms in the region, resulting in strong interpersonal ties.



Seamless Model

Members & Leadership

The Seamless consortium is a platform with a loose structure, "designed for enterprises by enterprises," that blurs traditional industry boundaries. The key resource is the individuals who represent their companies, but also form a quasi-independent knowledge community. This is radically different from a typical chamber of commerce, which promotes local business generally, or industry associations, which support a specific vertical and may develop standards, but don't typically engage in active projects.

The Seamless Consortium operates on an annual corporate membership model and Table 1 shows the initial and current membership, most of which are multi-billion-dollar revenue per-annum corporations. The enterprise members are carefully chosen to operate in non-competing spaces and most directly interface with consumers. With verticals covering the home, transportation, workspaces, nutrition and healthcare, multiple members could affect a single person's life over the course of a day. Most of the founding members are still active, with some growth and adjustment. Membership is priced at $150K per corporation which is a relatively small investment for the breadth of engagements facilitated. As a point of comparison, this is on par with the fully-burdened annual cost of one engineer or of supporting a single, focused research project at research university. While not a formal member of the consortium, the City of Grand Rapids engages with select projects, as discussed in the May Mobility case study, which also engaged other local companies.

The authors interviewed representatives of all current members of the Seamless Consortium.

Table 1 | Seamless Membership

MEMBER *(* denotes founding)*	DESCRIPTION	PERIOD
Wakestream Ventures* Headquartered in Grand Rapids, MI	Early stage generalist fund Deal sizes $150K–500K; Follow-on up to $1.5M	2015 – present
Faurecia* Innovation Center in Auburn Hills, MI	Automotive interiors & exhausts; Headquartered in France; Global manufacturing & sales	2015 – present
Steelcase* Headquartered Grand Rapids, MI	Architecture, furniture & technology products for offices, education & healthcare settings Global manufacturing & sales	2015 – present
Amway* Headquartered in Ada, MI	Direct sales & manufacture of nutrition, beauty, personal & home products; Global sales	2015 – present
Meijer* Headquartered in Grand Rapids, MI	Supercenter serving the American Midwest Food, homewares, personal care, gasoline	2015 – 2018
Spectrum & Priority Health* Headquartered in Grand Rapids, MI	Non-profit integrated healthcare system Operates in 13 counties in West Michigan	2015 – 2018
Trinity & Mercy Health Innovation Center in Grand Rapids, MI	Non-profit, national, Catholic healthcare system Operates in 22 US states	2018 – present
Whirlpool Headquartered in Benton Harbor, MI	Home, kitchen & laundry appliances Global manufacturing & sales	2018 – present
BISSELL Homecare Headquartered in Walker, MI	Home floorcare, air cleaning & pet products Global manufacturing & sales	2018 – present
Emergent Holdings Headquartered in Lansing, MI	Insurance & technology products for the healthcare industry	2019 – present

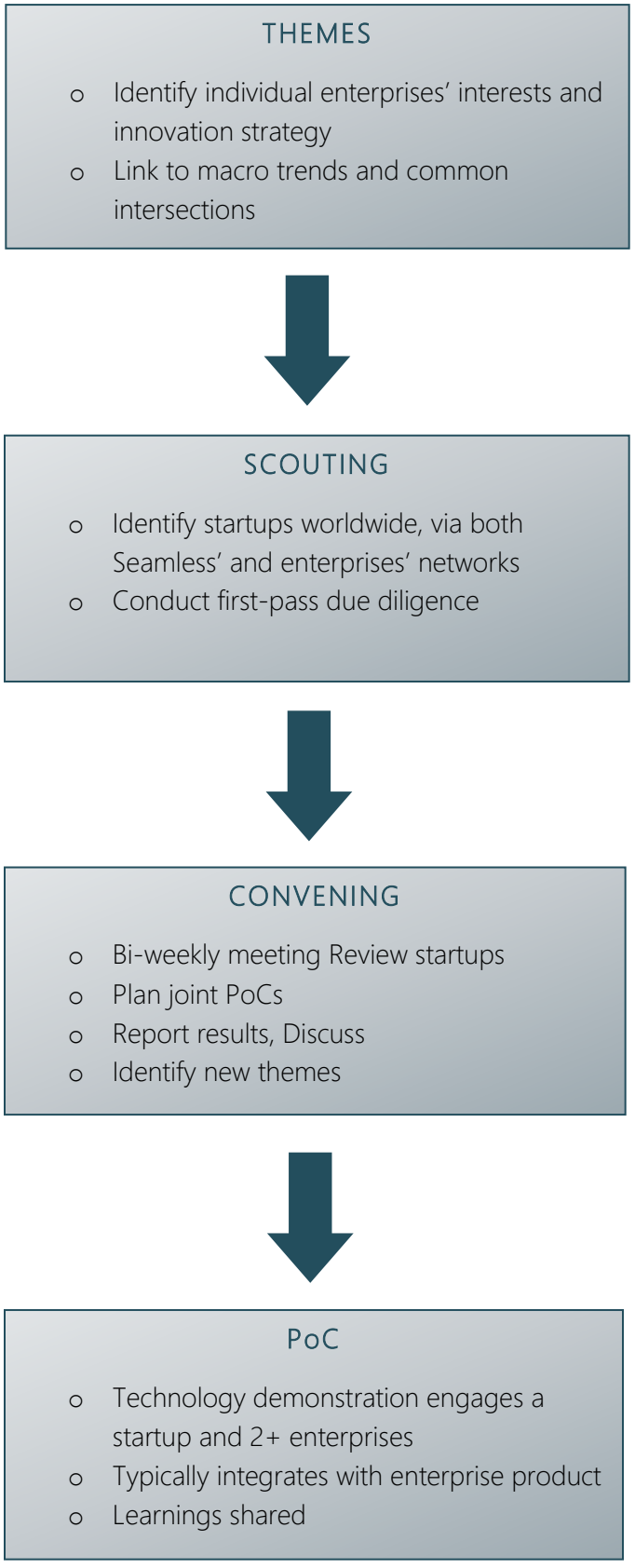
Seamless is a lean operation, with a five-person operational team consisting of two Directors and three Program Managers who support the scouting, tracking and engagement activities. Seamless also engages a handful of international scouts. The remainder of the team is comprised of approximately a dozen regular participants from consortium members. These individuals have job descriptions focused on innovation, wide connectivity to resources across their organizations and the ability to move with speed and flexibility to "sandbox" with startups. Enterprises that do not have dedicated innovation teams, with such individuals, are not well suited to Seamless membership, largely because they struggle to deliver with the speed and depth expected by a startup. Mike explains it directly, "There is an underground culture of people who live in tension with their enterprises and who have non-traditional ways to get stuff done! Seamless is the collection of these people!"

The team meets weekly to screen startups, report progress with ongoing projects, and plan next steps. This also provides an opportunity for the group to informally explore trends and share leads and learnings, not strictly related to Seamless projects. In this way, Seamless serves as a broader "brain trust" for member organizations.

Process Overview

In its current incarnation, Seamless, operates with a four-element process, shown in Figure 1. The process is not linear, rather it is recursive and continually develops in discussion between members and the Seamless team. Key themes of interest are identified on an annual basis and used to guide the scouting. Promising startups are discussed during weekly meetings and subset selected for more detailed discussions leading to the planning and execution of PoC experiments involving multiple enterprise members.

Figure 1 | Current Seamless Process



Themes Identification

Today Seamless is open to a wide range of technologies, beyond IoT, but still focuses on intersection points. Quoting Kaylee Page, a Program Manager, "The key is to find 'meaningful tech' that solves a real-world problem. While many other models [that engage with startups] make connections, they don't dive into the level of a hands-on, collaborative experiment. Seamless is focused on a deeper engagement."

The process begins with informal discussions to identify macro level themes of shared interest amongst the enterprises. For 2019 these included: "Health Beyond the Hospital," "the Good Life" and "Robust Future," a broad theme looking at waste and the environment. These were then broken down into intersecting sub themes, shown in Figure 2. These sub-themes were then rated by the enterprise representatives, based on four criteria:

1. Importance to their company's future according to a company's leadership
2. Importance to their company's future according to a company's innovation team
3. How well their company understands the theme
4. Recommended level of Seamless effort, from a single project to multiple projects

The analysis then looks for the areas of mutual interest, both in terms of overall ranking in importance and number of enterprises interested. It is important to note that Criteria 1 and 2 often reveal differences in perspectives between companies' innovation teams and management, which are important to capture. Based on the combined results across enterprises, the relative power of each sub-theme is determined, and bolded within Figure 2. Higher power themes resonate with multiple enterprises and indicate clear intersection of interest. Lower power themes, while important, do not represent strong alignment. In 2019 the highest-ranking sub-themes included "healthy behaviors," "personalized wellness," "clean environment" and "convenient & simple." These themes are used to guide and prioritize the scouting efforts.

Figure 2 | Seamless Innovation Themes

HEALTH BEYOND THE HOSPITAL

- *Health Behaviors**
- *Personalized Wellness**
- Health Equity

THE GOOD LIFE

- *Convenient & Simple**
- Independent Aging
- Workers & Productivity

ROBUST FUTURE

- *Clean Environment**
- Zero Waste
- Opportunity for All

**Themes important to all member companies*

Startup Scouting

Scouting for startup engagement opportunities occurs through multiple points. Seamless works with technology scouts based in Silicon Valley, Hong Kong and Israel, who serve to generate leads, evaluate local opportunities and report back on regional trends. These scouts are the largest source of identifying prospective startups. The Seamless leadership team also regularly attends conferences, startup showcases and demo days, as do many of the enterprises' innovation leads. Together this provides a wide-reaching network. Member companies also steer startups towards Seamless when they feel that the startup will be of interest to the wider group, as well as when it will benefit from greater vetting. This ability to conduct multi-enterprise expert vetting, from the screening stage onwards is a Seamless strength.

Convergence

Once the Seamless leadership team identifies a promising startup, the information is circulated among the corporate members and the startup is discussed at a regular Seamless meeting. If there is interest from more than one enterprise, a direct meeting is scheduled with the startup and this opens a separate discussion into a potential PoC experiment that is syndicated amongst two or more enterprises.

Proof of Concept Experiments

The goal of a PoC is to conduct a technology demonstration that generally integrates with two or more members' strategies. The general guiding questions include: Does this really work? Is this thing really desirable? Is it applicable to what we do? Will our customers want it? The PoC also helps enterprises answer additional questions about the strengths and weaknesses of the startup team and their business plan. Generally, these PoCs are conducted quietly, between the startup and the enterprise, as a technology demonstration and not a publicity vehicle, though the startup is free to use the data in further fundraising. The results of the PoC are shared with the larger Seamless group and there is an option for one or more members to participate in a further evaluation, with or without Seamless.

The cost of a PoC ranges from $20K – 150K and is typically split evenly between the participating enterprises. Once a project is agreed upon, this funding can be made available nearly immediately to a startup from Seamless' operating budget which is later reimbursed by the enterprises. Time to payment is a significant barrier when small, cash conservative companies engage with large enterprises, where 30 or 60-days to pay plus enrollment in vendor systems is the norm. Seamless addresses this impedance mismatch and enables a PoC to be conducted in as little as two months, from planning to execution to reporting. This is much faster than feasible with a typical industry development schedule and demonstrates the nimbleness of enterprise – startup engagement, when given the opportunity.

Legal Framework

Key to enabling a successful engagement and a PoC is a lightweight framework that soothes the way to engagement and enables shared learnings between startups and enterprises.

Seamless' operation is based, firstly, on trust between the members, which have agreed to work together in a way that is substantially different from a typical trade group or a joint venture. Key points from the *Member Operating Agreement* include acknowledging that:

- Members will have access to non-public, proprietary information from each other.
- Internal enterprise insights, data and assets will add value to the overall program.
- They can be shared among Seamless members, but not be distributed outside.
- Members will abide by the platform's shared vision, strategies and learning.

Secondly, when engaging with a Startup, Seamless serves as the single point of contracting with and between the multiple participating enterprise members. This encompasses the scope of work, project plan, timeline and budget, as well as any additional specific agreements.

Startups are often concerned about loss of IP, however at an early stage few are able to build a full portfolio, which can cost $100K per annum to maintain. Enterprises tread carefully to avoid entanglement and often generate substantial self-protective paperwork, which places a burden on startups seeking an early engagement. Seamless addresses this by carefully screening the startups, managing the enterprises' expectations and executing an unusually short (1 page) confidential disclosure agreement (CDA) that applies between each Startup Company and participating enterprise. Important terms include:

- The agreement is bi-directional.
- Disclosures are limited to discussing a specific technology.
- The information can be used internally by either party, but not disclosed further.
- The disclosure period window is 180 days, extendible with continued engagement.
- The agreement expires 3 years from the last information shared.

One of Seamless' members also shared their *Product Evaluation Agreement*, used when evaluating a prototype, that is similarly straight forward and bi-directional. Important terms include:

- The evaluation period is limited to 90 days, during which the company can non-destructively test the prototype function and document their findings.
- Any efforts to reverse engineer code or hardware are strictly forbidden.
- No licenses are implied based on this evaluation.
- The evaluating company may provide comments, positive and negative, and suggested improvements (including results, bugs, errors, compatibility problems and user-desired features) and both parties are free to use this information in their current or future products.

From the interviews with both enterprises and startups, it is clear that these agreements foster a culture of collaboration, reduce the paperwork barriers to engagement and define a relationship, where the goal is working together to conduct experiments, rather than a binary yes/no technology assessment.

Seamless' Numbers

Data from 2018 to the present regarding Seamless' flow were tabulated and are presented in Table 2. Some highlights include: Seamless is selective, with only 10.5% of companies identified warranting a database entry, out of which 21.1% are reviewed at a bi-weekly meeting. Of these 27.9% are scheduled for a meeting (online or in person) and basic demonstration to the larger Seamless team. Then only 14.4% of these result in PoC activity, overall 4.0% of the companies reviewed. From the PoCs, 60.0% have resulted in follow-on activity, such as an ongoing collaboration, co-development agreement or investment, however these are not further tracked.

In parallel with the Seamless process, 14.0% of the companies entered in the database are referred directly to an enterprise member. This occurs when there is clear alignment with a single specific vertical and, while these are not tracked for outcomes, this shows that Seamless' delivers additional value to members as a lead generator. Not specifically reported, are the portion of leads which originate from enterprises' referrals to the larger group, when they align with other members' verticals.

Table 2 | Seamless Companies Screened, Tracked and Engaged with from 2018 to Present

	Initially Scouted **	Database Entry	Reviewed / Discussed	Meeting / Demo	POCs Executed	Follow-on Activity w/ Enterprises	Funneled Directly to Enterprises
2020 (Jan-Apr)	~2.5k	240	80	32	10*	3	48
2019	~10k	858	208	65	11	5	193
2018	~10k	1258	210	42	9	4	88
Totals	22500	2356	498	139	20	12	329
% carry		10.5%		27.9%	14.4%	60.0%	
% of entry			21.1%	5.9%	0.8%	0.5%	14.0%
% of reviewed				27.9%	4.0%	2.4%	

Enterprise & Startup Insights

This research illuminated several themes related to enterprises' and startups' motivations for engaging with Seamless and their experience. Overall, we found that Seamless lowers the transaction costs for both the enterprises and the startups involved.

Enterprise Perspective

Seamless' members feel pressure to innovate for multiple reasons: Those in the consumer goods space, such as Whirlpool and BISSELL, face competition from international companies with diverse product lines and deep pockets that can offer similar products at lower price points, provide

more features or are direct knock-offs. Enterprises recognize that cutting margins, chasing lower cost manufacturing and adding product complexity are not sustainable competitive strategies. In such a climate, not just innovating, but protecting the innovation becomes a priority, hence they strive to identify novel technologies that will bring consumers additional value or unlock new market segments. Threats beget opportunities!

Enterprises are seeking ways to address questions related to fundamental shifts in technology and lifestyles. For example, Faurecia is responding to the changing demand profile for automotive components as electric vehicles replace conventional fuel vehicles. In addition, shared mobility and autonomy will bring changes in vehicle sales, ownership and operation which create opportunities for the "cockpit of the future." Likewise, changes in family demographics and home ownership affect the appliances that consumers buy. The structure of work has evolved towards more shared workspaces, technology enabled collaboration and, now in response to COVID-19, working from home, all which creates opportunities for Steelcase.

Healthcare expenditures represent nearly 19% of the US GDP[7]. Recognizing that this is not sustainable, creates opportunities for healthcare providers, such as Trinity and Emergent Holdings, to focus on increasing the efficiency of care delivered, developing new reimbursement models and responding to the shifts in how care is delivered and by whom. In specific, trends towards digital health, remote care and the use of artificial intelligence (AI) to assist with diagnostics, represent fundamental shifts rather than process improvements. Health at home is a growing theme that also resonates with Amway.

Enterprise members unanimously acknowledge that Seamless enhances their innovation efforts along the entire spectrum, from scouting to investment, by engaging with the entrepreneurial community and its perspectives. With its network of members, global scouting, startup companies discussed and tracked, Seamless compliments internal scouting efforts and increases the potential deal flow, with members including Trinity and Emergent Holdings acknowledging that the largest fraction of opportunities in their portfolio originate from Seamless.

Large enterprises typically see the future through their existing channels, therefore, Seamless' cross-industry perspective and facilitation of hands-on engagements, around shared themes are essential. As explained by one leader at Trinity, "Seamless' overlap and differing viewpoints provides a way to eliminate the bias that each individual industry has." Seamless is recognized as a trusted forum.

Finally, no matter what the longer-term outcome, Seamless' well-designed PoCs are viewed as creating learning for both enterprises and startups.

Startup Perspective

The 10 example startups were selected by the Seamless team to be stratified across the following dimensions: Age, location, year of initial engagement with Seamless, enterprise partners involved, stage of the startup and the level of follow-on engagement. Startups either no longer operating or currently bound by enterprise relationships were not selected. The companies interviewed, shown in Table 2, ranged in size from less than a dozen employees to 150. The technologies varied, from a potential supplier with an advanced haptic interface technology to a vehicle emergency alert system to an online employee health program. At time of engagement, their technology readiness levels, as described by NASA's TRL scale[8], varied from 4 (i.e., lab-level validation) to 6 (field pilot completed). As Seamless

[7] https://www.cdc.gov/nchs/fastats/health-expenditures.htm
[8] https://www.nasa.gov/directorates/heo/scan/engineering/technology/txt_accordion1.html

develops, it trends towards engagement with startups with more advanced technologies. During interviews the authors sought to understand the startup's background, it's history and timeline of engagement with Seamless, the nature and funding involved in the PoC, whether this created value for the company, how this influenced the company's roadmap and where the engagement could be improved. Here we share a gestalt of the insights, while the case studies detail specific examples.

Table 2 | Seamless Startup Engagement Examples

STARTUP	CITY, COUNTRY	DESCRIPTION	FOUNDING YEAR	SEAMLESS YEAR
Scanalytics	Milwaukee, US	Sensor-based analytics for physical spaces	2012	2015
Ultraleap	Bristol, UK	Mid-air haptics and 3D hand tracking	2013	2016
Vayyar	Ness Ziona, Israel	Mobile, low-cost, 4D sensors for diagnostics, tracking, automation	2011	2017
Sentiance	Antwerp, Belgium	Mobility tracking and profiling	2015	2017
HyperSurfaces	London, UK	Data-enabled sensing surfaces	2013	2019
HAAS Alert	Chicago, US	Real-time emergency alerts for drivers	2015	2015
Workit Health	Ann Arbor, US	Online, on-demand addiction treatment	2015	2016
May Mobility	Ann Arbor, US	Autonomous vehicles, enabling technology	2017	2018
Wiliot	Tel Aviv, Israel	Cloud connected, sticker sized, battery-free Bluetooth tags	2017	2019
LUCID	Toronto, Canada	Smartphone-based, AI-powered, adaptive music therapy	2017	2018

Startups appreciated the direct connections to enterprises, a key differentiator between Seamless and other programs. Quoting the CEO of Workit Health, "Accelerators should not exist that are not sales or core to products. There is enough free information on building a biz plan." Startups looking to evaluate / validate multiple potential markets had the opportunity to engage with up to four industry partners simultaneously and they noted that their Seamless contacts provided perspectives solidly grounded in business. The project management by Seamless was seen as fair and facilitating, while not overly constraining the startups with exclusivity agreements or other lock-ups.

Unlike many hardware-friendly groups, such as the M Hub in Chicago, IL or Bolt in Boston, MA, Seamless does not operate a fabrication space, but they do have a network of small vendors with special capabilities in the Grand Rapids region, a function of the region's design heritage. This connectivity, however, has not been utilized since 2016, when Seamless moved away from the accelerator model, but it should not be forgotten and could be revisited. A trend observed in three startups post-Seamless was a change in focus from specific custom hardware platforms towards software-based products. This is likely representative of a general trend in the technology community towards platform independence, coupled with a decreased interest in specialist hardware.

PoC funding ranged from $20,000 to $150,000, depending on scale, as well as in-kind support from sponsors including fabrication, integration and analysis. Startups reported contributing an additional 50 to 100% to the project, mostly in the form of labor costs. Each engagement was negotiated and, generally, Seamless covered the prototype costs. Startups' views on the return on investment from the Seamless engagement ranged from excellent, with 80% of the work directly applicable to their ongoing product development, to a potential waste of time, given the absence of a follow-on in one case.

Startups indicated that PoC engagements informed their trajectory and, in multiple cases, having data from a test implementation, with important brand names, supported further fund raising. Furthermore, each startup was able to share specific learnings based on the interaction. As an example, from working to integrate their technology into a Faurecia console, Ultraleap gained understanding of the challenges inherent in placing technology into a vehicle, developed requirements for their next generation technology and strengthened their UI/UX capability. However, the current Seamless model could not fully address the mismatch in the time constant between the automotive design cycle, which is 5 – 7 years for a new technology and the startup which is conducting planning on the order of months, so this did not result in a clear follow-on.

This highlights an ongoing challenge for Seamless, namely maintaining longer term engagements, while startups continue to grow and develop. Out of the 10 startups interviewed: 1 has continued a preexisting contract with a Seamless member; 1 has an ongoing project; 2 are developing further proposals; and 6 remain in contact with Seamless, though there are no planned immediate next steps. How to add value to these ongoing relationships is discussed in the Prospective. Despite Seamless' original focus on IoT, there is still a challenge in successfully integrating digital technologies into enterprises' pipelines. Overall, the Startups indicated that Seamless had achieved its goal of crafting a non-transactional relationship and desired ongoing engagement and mentorship from the enterprises and individuals.

Case Studies

In this section we present examples of PoC engagements between Seamless members and startups.

May Mobility

This case exemplifies a public – private partnership that, effectively, launched a mobile learning lab.

May Mobility was founded in 2017 by MIT alum Edwin Olson, PhD '08, a former member of the Toyota Research Institute and a current professor at the University of Michigan, Ann Arbor. May spun out of his research group, the April Robotics Lab, and is developing autonomous electric shuttles and accompanying technology. The startup is venture backed, with a Series B round closed in December 2019, which brings funding to date to $83M from investors including BMW iVentures and Toyota AI Ventures. The authors interviewed Tara Lanigan, Director of Business Development, and separately Josh Naramore[9], Director of Mobile GR (Grand Rapids), to understand the City's perspective.

[9] Josh Naramore is a Grand Rapids native and expert in transportation planning and technology. With professional experience in Florida, Oregon and Ohio, he returned home to an opportunity at Mobile GR. This is one example of an innovation community in Grand Rapids bringing home talent.

The engagement began in March 2018 at South by Southwest (SXSW), where Dana Lowell, Director of Open Innovation & Technology Ventures at Faurecia, and May Mobility Co-Founder Alisyn Malek, sat together on a panel discussing the future of mobility. May was preparing a pilot of their shuttles on a non-public route in Detroit and looking for more test sites. Seeing an opportunity in Grand Rapids, just two months later, Seamless brought together both private and public stakeholders to discuss the technology and frame up a pilot. Nine project sponsors, including Seamless members, other community collaborators, philanthropists and the City of Grand Rapids developed a plan and shuttles launched on city streets in July 2019.

May Mobility's free, 4 passenger shuttles run a 20-stop route in parallel with normal DASH (Downtown Area Shuttle) busses, which connect municipal parking with the commercial district. Prior to COVID-19 and suspension of service, over a 9-month period, May Mobility provided over 67,000 rides. Each vehicle currently operates with a human "safety driver" in attendance, but the company's goal is Level 4[10] autonomous driving. According to Josh, focusing first on the downtown and an existing route allows citizens to "see, touch and feel the technology." Hence, the attendant gathers data and insights from riders, which help with understanding how the technology, environment and populace interact to address real world, every day mobility issues.

Each month May Mobility submits a report to the City and Seamless. For the company and its automotive investors, data from a real, but constrained, urban infrastructure (with bicycles, pedestrians and snow) is essential. Seamless members Faurecia and Steelcase are, respectively, interested in learning first-hand the implications of autonomous vehicle technology on vehicle design and how changing mobility affects the workplace. Consumers Energy, the local energy company, is thinking about powering the next generation of mobility with clean energy. May is learning about very practical issues, such as compliance with the Americans with Disabilities Act, which spurred the development of a wheelchair accessible shuttle. Mobile GR is studying how micro mobility could change the City's structure, beginning with high-visibility downtown routes, but thinking further about outlying communities and last-mile connectivity. Rockford Construction is considering how the built landscape will adapt to new modes of mobility.

According to Tara, "Key to the ongoing Seamless relationship is having local contacts and roots that they could not access any other way." Seamless serves as a point of contact that brings together Enterprises, the City and other stakeholders, aligns differing objectives and disseminates the learnings in a way that no single entity could. The City is interested in exploring further smart civic technologies and Seamless provides a means to connect with vetted companies, not just concepts. On a broader scale, the May Mobility project demonstrates Grand Rapids' potential as a test bed for new technology startups, and as Josh explains, "It's harder to start in Chicago and scale down." The potential for Seamless and its members to play a bigger role in strengthening the local innovation ecosystem is discussed in the Prospective.

May Mobility Launch Event, July 25, 2019 (photos by Seamless)

[10] https://www.cnet.com/roadshow/news/self-driving-car-guide-autonomous-explanation/

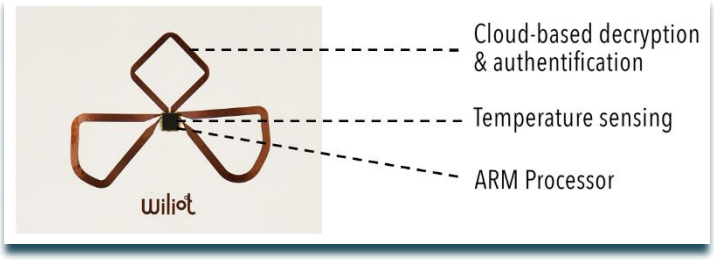
Wiliot

This case exemplifies a technology implementation project that efficiently engaged with multiple enterprises.

Wiliot was founded in January 2017 by a group of Israeli wireless engineers formerly affiliated with Wilocity, which developed multi-gigabit wireless technology that was acquired by Qualcomm. Wiliot has developed a postage stamp-sized chip and antenna array that harvests radio frequency energy and communicates identity, temperature and motion information to Bluetooth devices, via a cloud service. This has wide applicability in the packaging and transportation industries, especially for high value and perishable goods. The company is venture backed, with a Series B round closed in February 2020, bringing funding to date to $69M, with investors including Qualcomm, Samsung, Amazon, Alibaba, Pepsi, Maersk and Merck. Currently, Wiliot is developing reference designs and products that can be sold directly or via a 3rd party service with a launch planned this year. The authors interviewed Steve Statler, Vice President of Marketing and Business Development.

Wiliot was identified by Seamless' scouting in Israel and entered into the database in early 2018. There were numerous possible applications for the nascent technology among Seamless members' verticals, however Wiliot was still developing the technology. About a year later, Seamless became one of the first groups to participate in Wiliot's "Early Advantage Program" (EAP), whereby they carefully select companies, from many contenders, to test implementations of their technology. The project to develop a secure storage system using Wiliot's tags was spearheaded by Steelcase and joined by BISSELL, Faurecia and Whirlpool. Building a ground-up prototype was more ambitious than other EAP projects and posed a challenge for a company of only 30 people, but the opportunity to simultaneously engage with multiple large-scale brands and the consortium's willingness to cover the costs, made it worthwhile. As a demonstration of the Seamless ethos, quoting Steve "everyone felt like they were getting a fair deal." The prototype project was completed in 2019 and they are now discussing the next stage with Seamless and its members.

Seamless is the only consortium that Wiliot has worked with and, according to Steve, the PoC was one of the best structured and managed of their EAP engagements. In his experience, they have found some other companies less adept at identifying clear methods and criteria for evaluating a new technology. Furthermore, having early revenues and the support of trusted brands helped them close their most recent funding round. In summary, this case highlights the power of a consortium to offer a strong value proposition to a startup, while enabling the members to engage collectively in a highly efficient technology evaluation.



Wiliot tag (photo by Wiliot)

Lucid

This case describes an efficient experiment with an early-stage startup that facilitated its growth.

LUCID is an early-stage, Toronto-based startup that spun out of work by the CTO, Aaron Labbé, at Ryerson University in 2018. They are developing a smartphone-based, AI-powered, adaptive music therapy to reduce stress and, specifically, target acute anxiety. The initial product is aimed at customers aged 18 – 30 in North America, where the incidence of anxiety is 30%, but recently LUCID has offered their product for free to frontline

workers during the COVID-19 pandemic. According to the CEO, Zachary McMahon, one of the unique aspects of "digital therapeutics" is the ability to conduct real time monitoring of product usage. The company is gathering data under a research ethics board approval and intends to pursue clinical applications and claims.

Shortly after the company started, a Steelcase intern met Zoë Thomson, the CSO, at a conference in September 2018. This led to an introduction and a Steelcase team travelled to view the technology at Ryerson. Just a few weeks later, LUCID was invited to bring a prototype to Grand Rapids. This first prototype, consisting of software and hardware that drove a light, sound and vibration experience, was tested by 100 Steelcase employees. LUCID took the learnings from this experiment back to Toronto and began designing a more refined prototype, integrated into Steelcase furniture. Steelcase leveraged Seamless to also engage Faurecia and Mercy Health in developing this pilot. This was conducted in early 2019, with employees from all three companies using the LUCID system. The data from Mercy[11] was especially valuable, since healthcare employees work in high stress and arousal environments and provided insights from their perspectives as clinicians. This further helped LUCID understand what would be required for a clinical trial, with Mercy as a potential study site. Steelcase contributed their deep user research experience in collecting and analyzing data. LUCID is currently in discussions with Steelcase regarding further co-development and market opportunities, but is not in any way limited to this relationship.

This case highlights multiple aspects of Seamless' agile framework: The engagement was iterative and collaborative, growing in participation and scope. LUCID was able to access three separate verticals, as well as expert knowledge, while the enterprises participated in innovation that moved at "startup speed." LUICD felt that working with multiple companies increased trust, à la checks and balances, and they were comfortable starting their engagement under Seamless' lightweight legal framework and later developed more specific agreements with an enterprise partner. Capital utilization was efficient, with LUCID estimating that 80% of the PoC funding from Seamless supported further product development and, furthermore, it helped them decide which IP in their portfolio to prioritize filing. Validating that the experience was positive, in closing the interview, Zach noted that the Seamless model has promise for replication in Canada.

In summary, this Seamless engagement provided enterprises access to a very early stage university spinoff, addressed the impedance mismatch, contributed to the growth of a startup and has opened the door to ongoing collaboration with an enterprise partner. Taking this further, there is potential for the Seamless entity to play a greater role in a promising startup's growth and development, beyond the PoCs and follow on agreements.

Zach McMahon and the LUCID system in a Steelcase chair (photo by LUCID)

[11] Because the testing was non-clinical and with healthcare professionals, not patients, ethics approval was straightforward.

Retrospective

This section summarizes the combined insights of the Seamless leadership team, enterprises' innovation leads and the startups interviewed with the authors synthesis and interpretation.

Strengths

Fundamentally, Seamless lowers the costs of enterprises and startups working together.

The Seamless model has demonstrated the ability to successfully bring together large enterprises to identify forward-looking themes of mutual interest, which are not necessarily served by internal innovation teams. Scouting around these extends the enterprises' collective reach. Seamless serves as a "middleware" that addresses the significant impedance mismatches between the two classes of entities. Paperwork is minimized, financial transactions can be completed in a matter of weeks and a collaborative experiment designed and executed in as little as a quarter. Overall, this provides member enterprises the ability to execute at "start-up speed" while investigating broad themes. Risk is syndicated and, more importantly, learning shared.

Seamless creates learning for both parties: Enterprises' innovation-focused teams have first-hand access to dabble in new technologies and understand them at a depth that is not typically possible. Startups access the market data, insights and deep industry expertise of the Seamless team. Specifically, the data from the PoCs can help steer their product development, increase their TRL and provide evidence of potential first/early customer partnerships.

The presence of Seamless reduces transaction costs for both enterprises and startups. Such a reduction in transaction costs can be summarized and measured as follows:

Transaction Cost =

Cost of selecting right startups +
Cost of finding right contact within enterprises +
Cost of defining and starting POCs +
Cost of moving the POCs along

Together, it is clear that this unique trust-based innovation network and engagement model is feasible and valuable.

Challenges

Seamless facilitates successful startup-enterprise engagements, however, there are challenges, which highlight opportunities to continue to develop the model to create and capture more value for both enterprises and startups.

The Seamless process, from theme identification to scouting to discussion to PoCs, is thoughtful and comprises an enviable startup and technology vetting procedure that also adds significant value to a startup. However, each enterprise member has a different level of experience and maturity when it comes interacting with startups and incorporating new ideas. At an early stage, a startup, with a valuation of several million dollars, presents an opportunity that is still orders of magnitude smaller than those that a large corporation typically chases. Furthermore, engagement options are still limited by the typical tools at the disposal of enterprises, namely, licensure, supplier agreements, joint development agreements (JDAs), and acquisition. Startups struggle with maintaining long-term relationships with enterprise partners and Seamless has not quite fulfilled part of its original mission to provide startups with "mentors, strategic investors, customers and seed capital." Neither Seamless nor its member companies are incentivized to select startups based on raw growth potential, drive them towards the highest value markets and capture a

fair share of that value as they grow. This disconnect ultimately means that there is money and opportunity left on the table in the long run.

Seamless has moved from working with just an idea, in Start Garden's first iteration, to early stage startups, in the first accelerator incarnation, to focusing on more developed technologies today. Unfortunately, while this move towards enterprises' comfort zone reduces risk, it also reduces Seamless' bandwidth to explore the "wild" ideas that lie in white spaces. Thus, it trends towards less of an innovation engine and a more of a service organization, which reduces its impact potential.

There is a clear opportunity to expand Seamless' model to follow startups as they grow financially, provide ongoing mentorship and by guiding continued enterprise interaction.

Seamless brings together a community of individuals from non-competing organizations, both large and small, with a focus on innovation. While strong interpersonal relationships have helped Seamless grow and individuals' interactions increase their organizations' knowledge, the consortium is not yet leveraging the full opportunity for a network effect. Seamless was designed to be flexible and enable exploration of areas of intersection and, with its knowledge, connectivity and trust, it has a means to help enterprises re-orient their cultures with a longer-term approach to innovation.

Enabling Elements

How feasible is it to replicate or adapt the Seamless model to other clusters? While an authoritative answer requires a deeper study, from the present work it is possible to identify and abstract key enabling elements. These are presented in order of more concrete to abstract:

- Non-compete industry verticals: The most important element that makes Seamless possible is the availability and diversity of large industrial companies, serving different verticals. This allowed the creation of a carefully curated group that works together and shares confidential information. Other regions with an industrial legacy may host non-competitive industries representing different verticals than the ones present in Grand Rapids.[12]

- Investment Capital: Seamless grew out of Start Garden, which was made possible by a large initial investment that created momentum around the idea of an innovation ecosystem. Though Seamless is not an investment vehicle, Wakestream Ventures is a member and remains an important element of the ecosystem. Even in older industrial bases, capital may be the easiest ingredient to make available.

- Manageable geographical span: Most Seamless member companies are all located within 30 minutes driving distance of each other and Whirlpool and Emergent are just over an hour by car from Grand Rapids. Proximity enables frequent in-person interactions at Seamless headquarters - getting around easily make getting stuff done easy! Grand Rapids' arts culture, evolving downtown and affordability is expected to become increasingly attractive to the young professionals who power an innovation ecosystem. Another region looking to implement such a model should consider attractiveness, accessibility and affordability.

- Culture of design and innovation: West Michigan has had a long tradition of a culture of design that has spread across and fueled the growth of industries in the region. This heritage has also led to a group of specialist fabricators, which supply the larger entities with the

[12] A detailed review of why Chambers of Commerce and industry associations differ from Seamless is worthwhile, but also beyond the scope of this work.

capability to prototype fast. Individuals with the knack for innovation have moved around, cross-pollinating enterprises, and bring a diverse skill set and design thinking skills to bear, which are not limited to specific verticals. Undoubtedly, other regions can harness similar, latent talent.

- Community of trusted professionals: Building off the culture and facilitated by proximity is a community of trusted professionals. They know each other personally, connect independently of their current employers and call each other for expert advice, certain of getting a quick and honest response. This community is very difficult to create and is, probably, the true precursor of Seamless. For regions hoping to develop a Seamless-like model, it would be important to start by understanding the community structure as the very basis of an innovation ecosystem.

Prospective

Seamless has the potential, over the next five years, to grow into a thinking organization that not only scouts for, engages with and invests in startups, but also has the potential to help define member enterprises' visions, with a time horizon projecting a decade or more in the future. This requires a co-evolution of both Seamless and the enterprises' structures for interfacing with the startups.

The first step is a change in perspective to think about potential lifetime startup value. The present criteria for selecting startups, defining a PoC and assessing the results, is based on extrapolation from enterprises' current lines of business, is pragmatic, but does not encompass this broader perspective. The new, suggested evaluation matrix has two components:

Total Value of the Startup to a Member Enterprise =

Value of the startup to the existing business + *(as evaluated by the enterprise's technology and business leaders)*

Value of the startup irrespective of the existing business (as if evaluated by an investor informed by collective wisdom of the consortium)

Evaluating the value to an enterprise's existing business does not require a significant change in corporate perspective, other than a more long-term projection. The second component, a stand-alone value assessment, requires an evolution of Seamless and new modes of operation and engagement grounded, nevertheless, in the interplay between the deep expertise of enterprises and the startup perspective. It is important to emphasize that this is much more comprehensive than a 409A fair market valuation.

From the Retrospective, three opportunities for longer-term value creation and capture arise:

Seamless Ventures

Startups that have engaged with Seamless have received investments from prominent companies including Toyota, BMW, Qualcomm, Samsung and Amazon. While it cannot be definitively proven, Seamless PoC engagements and the access to enterprise partners have probably enabled startups to increase their valuations, without Seamless as an active participant. This is surprising, given Seamless' heritage with Start Garden and that its first incarnation as an accelerator involved investment positions. Seamless Ventures, LCC already exists and could serve this purpose independent of the Seamless activities under the Start Garden 501c3.

Seamless' enterprise members, aside from Wakestream, have a limited presence in the venture

community, with only two members maintaining active corporate venture capital (CVC) wings. Trinity is affiliated with multiple health-focused venture funds and Faurecia directly operates Faurecia Ventures,[13] with the expressed goal of advancing the company's innovation strategy "by identifying, incubating and investing in start-ups with relevant technologies for Sustainable Mobility and the Cockpit of the Future." Amway, Steelcase, Whirlpool and BISSELL do not operate CVC wings. Emergent Holdings is limited to entering into joint ventures.

CVC is growing, as discussed in a 2018 Accenture article, "Corporate venture capital: Driving innovation,"[14] which asserts that 63% of Forbes Global 500 companies have utilized CVC and that the establishment of CVC is correlated with index beating stock performance. One of the best examples of CVC, with a Midwest-style approach, is 3M Ventures.[15] "The purpose of 3M Ventures is to advance 3M innovation by creating growth options in areas of strategic interest through minority equity investments, leveraging the global entrepreneurial and venture community." This could easily be the ethos of a Seamless fund with a key distinction – access to multiple companies with global reach. Enterprises would contribute to the fund, potentially along with outside investors, and syndicate the risk. This would also assuage startups' concerns regarding being too tightly bound to a particular enterprise.

The insight gained from the Seamless process of engagement, from initial contact to entry to review to demo to PoC, has the potential to produce a much deeper vetting and understanding of the strengths and weaknesses of the team and technology, as compared to the assessment conducted by a conventional, early stage investor, who rarely has under-the-hood access. Furthermore, assessment of a startup based on relevance to several industries would further de-risk investment decisions. Likewise, portfolio companies would leverage the expertise of mentors from across industries, access potential beachhead clients and likely engage in joint development opportunities. Even where a successful startup does not end up in a long-term enterprise partner relationship, there would be an upside capture.

Seamless Mentoring

Several of the startups interviewed indicated interest in a continued relationship with the Seamless network beyond PoCs, but currently no means exists to enable this.

A significant output of the Seamless model is the social capital it generates by identifying corporate innovation leaders with the "get stuff done" attitudes. These individuals would serve as excellent, longer-term mentors for startups. Likewise, entrepreneurs often have a whole range of diverse experiences, contacts and resources that are typically hidden from enterprises, but are potentially a benefit to them. Seamless is an ideal trusted platform to enable ongoing enterprise – startup relationships, as a compliment to a fund, as well as independent of it.

Such relationships could take different forms: A formal Seamless mentorship program would assign specific leaders to work with startups. For the enterprises, this would facilitate watchful waiting, during which the startup could be evaluated on the metric of its own growth, not in comparison with corporations multi-billion dollar-level revenues. Seamless could also continue taking an active role in developing next-generation, more sophisticated PoCs, with individual or multiple enterprises. This would enable enterprises to continue at "startup speed" under Seamless' lightweight framework, while focusing the project towards applied goals.

[13] https://www.faurecia.com/en/innovation/faurecias-innovation-ecosystem/faurecia-ventures
[14] https://www.accenture.com/us-en/insights/strategy/corporate-venture-capital
[15] https://www.3m.com/3M/en_US/company-us/about-3m/3m-ventures/

Together, this would substantially address the challenge of keeping in close contact with a promising technology, while a startup is still too early stage to enter into more formal agreements, and address startups' desires for more even, sustained engagements. Overall, holding startups closer will strengthen Seamless' knowledge community and foster longer-term, emergent opportunities.

Seamless Strategy

Seamless' greatest strength is its community and network and it has the potential to grow into an enterprise think tank. This would harness the unique formal and informal information sharing structure that Seamless has put into place, to gather internal and external knowledge and produce content relevant to both startups and enterprises.

Firstly, Seamless can proactively analyze the cross-sector competitive landscape and inform enterprises' strategic leadership of trends, threats and opportunities on a regular basis. Secondly, Seamless can investigate sub-themes that are important in terms of national and global trends, but challenging to enterprises, because they lack a clear path to an immediate product. Thirdly, Seamless can work with enterprises to develop strategies that improve their internal innovation efforts following global best practices. Lastly, Seamless can strategically increase the scale and scope of its scouting to encompass a broader swath of the startup landscape. Furthermore, guided by this research, there is a potential for enterprise members to work closer together to craft joint products or services where the business models overlap seamlessly.

Go global, or go home! Today innovation is global and Seamless should focus on exploring not just opportunities originating from high-tech clusters, such as Silicon Valley and Israel, but also opportunities that provide access to low- and middle-income countries (LMIC). These are home to nearly 40% of the world's people and, on average, population, GDP, education and life expectancy are increasing[16]. These represent markets ready for engagement by trusted brands. This same perspective can be applied to finding ways to build meaningful connections with traditionally underrepresented groups.

Community Growth & Inclusiveness

Seamless is an important member of the Grand Rapids innovation ecosystem and is uniquely placed to influence some of the biggest employers in the West Michigan region towards activities that positively grow the community. While not a primary subject of this work, this emerged as a compelling theme in conversion with Darel Ross, Jorge Gonzalez and Paul Moore, three of Start Garden's directors, along with Mike Morin.

Attracting and retaining talent in the West Michigan region, regardless of whether they are employed by enterprises or entrepreneurs, strengthens the overall ecosystem and increases competitiveness. Traditional corporate social responsibility has focused on "giving back," by supporting local communities philanthropically, but as Paul pointed out, "corporate responsibility and R&D should not be firewalled. The divisions between the corporate campus and the city that the employees live in should come down!" Seamless already straddles worlds and in May Mobility has an example of creating a rich public-private partnership. It is well positioned to encourage members towards a more strategic approach.

According to Darel, core to this must be focus on "equitable opportunity for everyone." Grand Rapids is really a "tale of two cities," with minorities facing an income and opportunity disparity. A 2015 report by Joel Kotkin and Wendell Cox's Urban Reform Institute and the Chapman University Press, entitled

[16] https://data.worldbank.org/income-level/lower-middle-income

"Best Cities for Minorities,"[17] ranked Grand Rapids a dismal 51/52 out of major US metropolitan areas for African Americans and 41 for both Hispanics and Asians. These rankings led the Start Garden team to refocus their recruitment and the results are positive: Their 2019 "100 Ideas" cohort of founders is 51% female, 14% Latino and 45% African American. For reference, grand Rapids population is 15.9% Hispanic/Latino and 19.2% African American.[18] The report highlights the importance of minority entrepreneurs and broad-based economic growth for the upward mobility of minorities. Both the growing innovation ecosystem and the large employers that form the economic backbone of the region can play a role in transforming Grand Rapids into what Kotkin terms an "opportunity city" for minorities.

Seamless has already identified "Opportunity for All" and "Health Equity" as important themes, however, in general, it is challenging to directly connect inclusivity to a company's bottom line. Furthermore, even well meaning "initiatives" can seem perfunctory unless woven into a company's fabric. Seamless already looks outside enterprises for innovation and startups may be a key element. A Kauffmann Foundation article "Investing in minority entrepreneurs: an economic imperative for the U.S."[19] drives this home in the context of changing US demographics, where by 2060 "minorities" are expected to be the majority. BCG in collaboration with MassChallenge, published an article in 2018 entitled "Why Women-Owned Startups Are a Better Bet"[20] pointing out that, while underinvested, female founded or co-founded companies performed better on average over time.

There is a clear mandate for an ongoing conversation regarding how Seamless can be a thought leader in ensuring that diversity is core to the growth of the Grand Rapids innovation ecosystem.

Conclusions

Seamless was built by enterprises in the Midwest for enterprises that, together, wanted to identify new technology trends, identify promising startups and engage with them. In this aim, they have successfully demonstrated the ability to transcend the silos of their organizations and verticals, developed a non-traditional means to non-competitively share information and facilitated experiences around hands-on engagements with startups. This model addresses the typical impedance mismatches that hinder early-stage startups from developing meaningful relationships with large enterprises and provides startups with hands-on industry data, validation and perspectives that would be hard to otherwise obtain. These experiments are characterized by an unusual degree of bi-lateral fairness. Together, this shows the power of developing highly networked, learning communities that have the flexibility to craft new models for open innovation. This has broader implications for the economics and social growth of the Grand Rapids and West Michigan and, most likely, can be adapted and adopted in other regions in the United States and abroad.

[17] J. Kotkin, "Best Cities for Minorities: Gauging the Economics of Opportunity," Chapman University Press, 2015. Available: https://urbanreforminstitute.org/2015/05/best-cities-for-minorities

[18] https://www.census.gov/quickfacts

[19] https://www.kauffman.org/currents/investing-in-minority-entrepreneurs-an-economic-imperative-for-the-us

[20] https://www.bcg.com/publications/2018/why-women-owned-startups-are-better-bet.aspx

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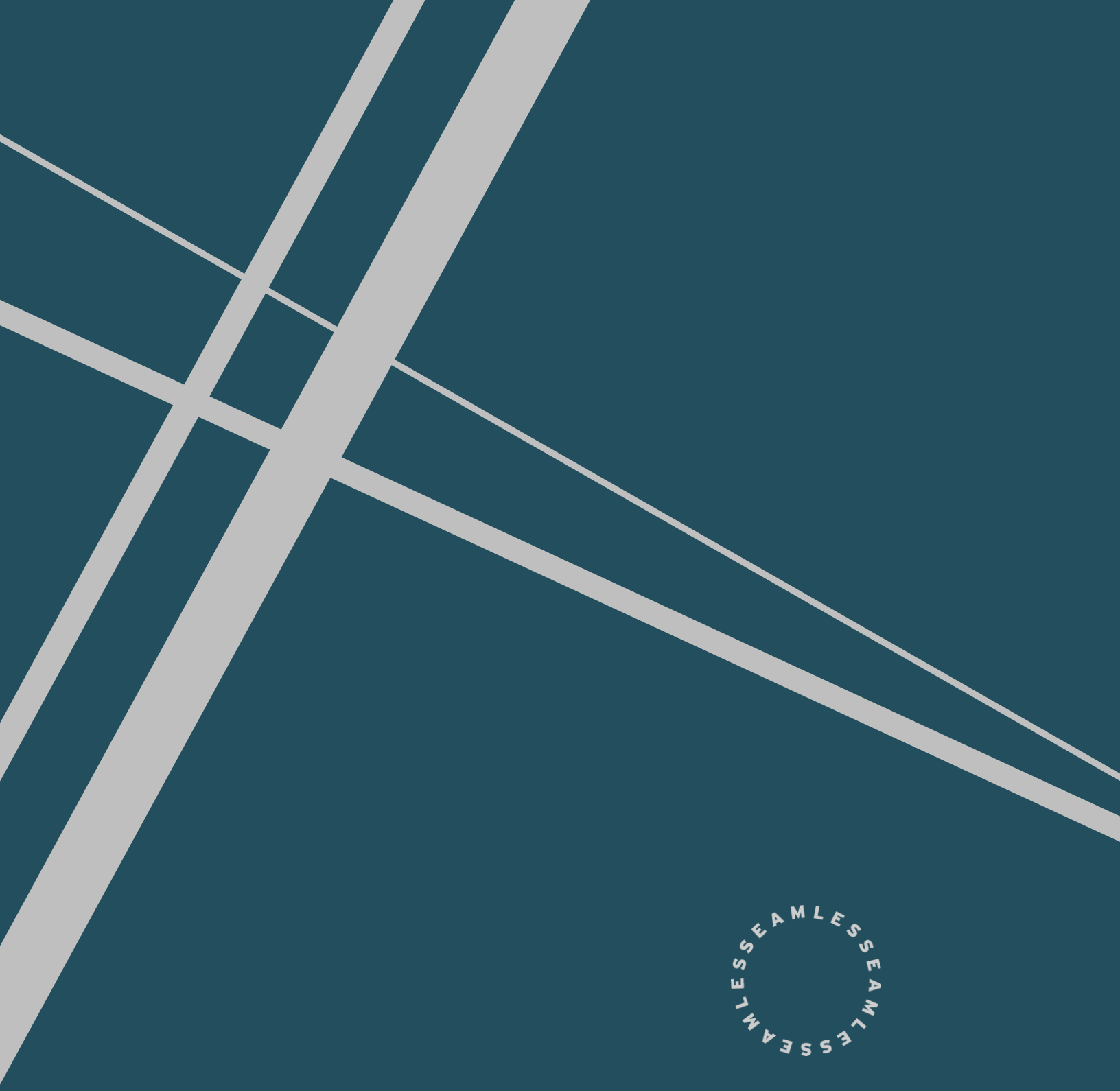

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June 2020