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INTRODUCTION

When the University of Michigan Social Venture Fund (SVF) launched in September 2009 as the first student-led impact investing fund, it sought to invest in and support innovative companies that place social and environmental impact at the heart of their business models. Investees today are required to demonstrate measurable and positive social or environmental impact alongside a financial return, and through the due diligence process, teams of SVF associates conduct rigorous analysis on both. Since its founding ten years ago, SVF has grown a portfolio of nine early stage companies with missions in four issue areas: food systems and environment, healthcare, education, and urban revitalization.

Looking back on SVF’s first ten years, a team of students set out to understand which portfolio companies have been impact stars, which have struggled, and how all of their experiences can inform future investments. Additionally, we assessed SVF’s contribution to portfolio companies’ understanding of their impact via consulting and capacity building projects. This report contains lessons learned, reflections, and recommendations for maximizing the impact of SVF’s investments in the years to come.
Over the years, SVF has leveraged impact investing expertise from a variety of thought leaders, including the Global Impact Investing Network (GIIN), Acumen, Root Capital, and others.

Source: Developed by SVF student members under guidance of Gautam Kaul
In 2015, SVF developed a qualitative logic model to guide its analysis of potential investment companies’ social and environmental impact. This logic model is adapted from a 2014 California Management Review article, “What Impact? A Framework for Measuring the Scale and Scope of Social Performance” by Alnoor Ebrahim and V. Kasturi Rangan. It identifies seven key elements affecting an organization’s potential for impact performance and analyzes these elements both separately and collectively to provide a holistic view of a company’s impact potential. During the 2017-2018 SVF cycle, associates analyzed product outputs, stakeholder outcomes, and ultimate macro-level impact to develop theories of change and impact metrics for each portfolio company. Below is an example of this impact framework for Querium, an educational technology company in SVF’s portfolio.

**QUERIUM: THEORY OF CHANGE**

![Logic Model Diagram]

- **IMPACT**
  - Nationally, the STEM skills gap is reduced → stronger economy
  - Individually, better career outcomes (higher earnings, satisfaction, etc.)

- **OUTCOMES**
  - Improved test scores and pass rates
  - Fewer students in remedial classes
  - More students graduate with adequate STEM skills (degree)

- **OUTPUTS**
  - # of Problems Completed Per Student
  - # of Hours Spent on Platform
  - # of Total Active Users

**INPUTS**

- Product for Community College Placement Exam
- Get contracts from CC systems
- Product sold for General Test Prep (AP Calc)
- Market product to B2C market
- Develop partnerships with publishers and online tutor services
- Develop product allowing you to enter own problems (ex: wolfram)
- Hire more engineer staff
A NEW FRAMEWORK: REFORMIST VS. TRANSFORMATIVE IMPACT

Although these theories of change and impact metrics provided an effective framework for considering impact during the due diligence process, the lack of available data for continuous tracking presented a challenge in calculating an impact “return on investment” number.

Determining an Impact Multiple of Money\(^1\) or social return on investment (SROI) seemed to rely too heavily on abstract assumptions and be too focused on short-term outputs, rather than long-term impact. Moreover, the framework focused on companies within the portfolio (and within the sectors they work in) in isolation from one another, rather than their magnified impact on the issues they address.

In the process of gathering output, outcome, and impact data for each company, the team noticed several trends across companies that highlighted cross-cutting successes and obstacles. Inspired by the Omidyar Network’s impact analysis model,\(^2\) as well as Marbre Stahly Butts and Amna A. Akbar’s article, “The Transformative Reforms of the Movement for Black Lives,”\(^3\) we built on the existing SVF impact logic model to help us further understand the portfolio’s impact. In order to assess SVF’s portfolio impact holistically, we viewed company outputs and outcomes through the lens of reformist vs. transformative impact.

### REFORMIST IMPACT:
Companies with reformist impact deliver immediate, direct services to their own stakeholders, including customers or beneficiaries. These companies tend to have more measurable outputs and immediate outcomes, such as energy efficiency or improved test scores, and may focus on alleviating the symptoms of larger systemic challenges (in their article, Stahly and Akbar give the example of police body cameras as a means of alleviating the symptoms of structural problems within policing). The significance or depth of the impact on those individuals, the socioeconomic status of those reached, and the scale of the company should be considered. These companies may be locally focused on smaller-scale impact, such as a neighborhood grocery store.

### TRANSFORMATIVE IMPACT:
Other companies promote system and sector-level impact beyond the immediate stakeholders as they catalyze transformative change, such as shifting the way patients communicate with doctors and get medical care (rather than simply providing an additional tool) or shifting consumer preferences for protein consumption. While these companies tend to be riskier and harder to measure, they focus on disrupting the status quo and addressing the root cause of social and environmental challenges.

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As shown in the graphic below, some companies fall on a continuum of reformist to transformative.

The matrix above is based on companies’ theories of change rather than realized outcomes, but success in achieving these goals is addressed in the analysis throughout this report. Rather than prioritizing reformist vs. transformative impact, we believe that all of SVF’s portfolio companies fall somewhere along a spectrum of both. Ideally, SVF would build a portfolio of companies tackling particular sector-level challenges from both angles: for example, SVF could complement the investment in Chirps (which promotes insect consumption as a more sustainable protein alternative) by pursuing an investment with a company that alleviates the immediate symptoms of unsustainable agriculture practices.

Sources and Inspiration: “Omidyar Network’s First 10 Years: An Impact Analysis.”
Viewing our investees in this way illuminated three major themes among the nine portfolio companies:

**THE LONG TAIL OF IMPACT:**
Companies working toward accomplishing a socially-driven goal with difficult-to-measure outputs and long-term outcomes. These companies tend to fall into the transformative impact category, including LearnZillion, Conversa, and Chirps.

**LOCKSTEP COMPANIES:**
Those with measurable impact built into the business model, where impact and profit move in lockstep. Powerhouse Dynamics, Court Innovations, Querium, and Dryades fit squarely under this description.

**VALUE-ADDED IMPACT INVESTMENTS:**
Investees that have benefited from SVF associates’ expertise in impact measurement, both enabling them to be better corporate citizens and articulate their outcomes. In the past two years, SVF has collaborated with Court Innovations and Chirps on impact measurement portfolio consulting projects.

Grounded in the reformist and transformative impact model, these themes are explored throughout this report. Our assessment culminates in lessons learned and recommendations for improving the SVF impact framework, which we hope will drive both financial and impact returns in the years to come.
IMPACT THEMES
THE LONG TAIL OF IMPACT

Companies accomplishing a social goal with difficult-to-measure outputs and long-term outcomes

Many companies in which SVF would potentially invest have a very long tail when it comes to social and environmental impact, meaning their impact will be realized long after the company matures and its operations peak. The long tail companies in our portfolio aim to have transformative impact by bettering education, streamlining communication in healthcare, and providing resources for urban revitalization—all missions that will be realized over time. While the immediate output is not measurable, these companies aim to help solve these challenges in the medium to long term.

Some companies aim to play a gradual role in changing industry norms over time, whereas others need to reach a certain scale or be operating for a period of time before outputs lead to outcomes and impact. For example, LearnZillion is a digital curriculum company that creates powerful learning experiences, so teachers don’t have to reinvent the wheel. By subscribing to the smart curriculum platform for common programs like Illustrative Mathematics, districts empower teachers to spend less time building student-facing materials from scratch and more time strategizing to meet their student’s needs. The immediate output is shared resources and lesson plans, but the future outcome is a measurable improvement in student experience. These outputs not only lead to outcomes of improved test scores and graduation rates for the individual students, but they also drive transformative impact by changing the way curriculum is delivered and influencing the education sector.

Because of the long-term nature of realizing impact among these companies, SVF believes that the best long tail investments are in companies with a strong theory of change that aim to have sector-level, transformative impact.
“...thanks to software, the standalone textbook is becoming a thing of the past. All of this is a complement to what teachers do, not a replacement. Your teacher gets a rich report showing what you read and watched, which problems you got right and wrong, and the areas where you need more help. When you come to class the next day, she is equipped with a ton of specific information and suggestions to help her make the most of her time with you. Zearn, i-Ready, and LearnZillion are examples of digital curricula used by students and teachers throughout the U.S.”

— BILL AND MELINDA GATES 2019 ANNUAL LETTER
Example: Conversa

**Company Overview:** Conversa, a healthcare conversation platform, aims to involve and engage patients with their own healthcare plans by facilitating doctor-patient communication between in-person visits. Through consistent conversation via mobile device, the product enables patients to partner with their healthcare professionals in achieving positive health outcomes; it draws from a large clinical content library for “clinically intelligent conversations,” utilizing behavioral science methodology to educate patients and allow them to be active participants in their own care plans. Used by hospitals and large health systems, Conversa drives higher patient engagement and satisfaction, ultimately leading to better health outcomes for patients and cost savings for providers.

**MOBILE CONVERSATION PLATFORM THAT DELIVERS IMPROVED OUTCOMES FOR BOTH PROVIDERS AND PATIENTS:**

- Unprecedented population health insights for clinical care teams
- Real time risk assessment to optimize patient escalation process
- Patient engagement in their own care plans
- More productive patient time with doctors as a result of increased data and communication between visits

**Theory of Change:** Conversa seeks to increase the breadth and depth at which patients can be actively involved in their own healthcare. Mounting evidence suggests that patients who are actively engaged with their own care achieve better health outcomes at a lower cost to the hospitals and health systems that serve them.4 Furthermore, U.S. health insurers are increasingly shifting towards outcome-based reimbursement, where providers are reimbursed for positive performance as opposed to services rendered.5 Providers are incentivized to deliver better outcomes, and Conversa provides a low cost way of better educating and engaging patients, which should yield better outcomes.

Conversa’s impact can ultimately be measured by a healthier patient population and a more efficient healthcare system. Their product allows patients to be educated and engaged enough to be invested in the structure of their treatment, while more frequent and dynamic touch points between hospital visits increases care plan adherence. Ultimately, this results in reductions in both re-admissions and preventable complications. Furthermore, hospitals can operate more efficiently as they can predict missed appointments and other care trends. Patient time with doctors becomes more productive with increased data and communication between visits, allowing hospitals to better optimize their resources as they devote less time and fewer resources to education and compliance.

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Falling in SVF’s “long-tail” category of impact, Conversa is changing the way healthcare providers and patients communicate as it grows its number of users and enhances the quality of its platform. The image below shows a framework for evaluating patient engagement from the Health Affairs journal.⁶ Conversa currently impacts patients on the “direct care” level, as it increases the quality and amount of information available to the average patient. This falls squarely into the consultation phase of “direct care” engagement in the framework below. Conversa currently enhances the consultation phase of “direct care” by enabling patients to better receive information outside of hospital visits. As Conversa continues to expand, we hypothesize that the company could move into the “involvement” and “partnership and shared leadership” levels on the continuum of engagement. As patients become systematically more educated and engaged, doctors are more likely to ask them about their preferences and collaborate with them on certain treatment decisions. In the long run, Conversa could deepen its impact by moving into the organizational design and governance level of engagement. If Conversa grows to play a pervasive role in the health systems in which it operates, it could begin to impact the way in which these organizations think about and structure the parts of the organization responsible for patient engagement and compliance.

**Measuring Impact:**

**DIRECT IMPACT—**

**Patient Satisfaction and Engagement**

Two key metrics used to measure the effectiveness of the Conversa app are 1) the level of engagement within the app by patients and 2) the overall satisfaction of the app by patients. Conversa aims to increase this satisfaction and engagement among its user base. In markets where Conversa is available, 81% of patients are actively engaged in their care by using the tool, and 80% report feeling more engaged than they were before they began using Conversa. Currently, 94% of Conversa users are satisfied with their care experience.⁷ This is measured by a self-reporting survey question administered at the end of each conversa conversation.

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⁶ James.
⁷ Conversa Health: [www.conversahealth.com](http://www.conversahealth.com)
This direct method of engagement enables patients to receive immediate information on diagnosis and make decisions based on personal preferences. This increased access to information helps patients adhere to their plans. Conversa has begun tracking this metric, and reports that 72% of users are considered “on track” with their care plan or have improved their adherence to the care plan since they began having regular conversations.8

LONG TAIL, TRANSFORMATIVE IMPACT —
Patient Decision Making Support and Patient Activation
Conversa is solving a persistent patient- engagement problem in the healthcare sector. To quantify patient control over healthcare, Judith Hibbard at the University of Oregon conducted a survey that scored the degree to which patients felt in control of their own health and health care, known as a “patient activation measure.” In a survey of more than 30,000 patients, those with the lowest activation scores (people with the least confidence to actively engage in their own health care) incurred costs that averaged 8 to 21% higher than patients with the highest activation levels. Patient activation scores were shown to be significant predictors of health care costs9.

A study by David Veroff at Health Dialog corroborated this evidence, finding that patients receiving decision-making support, such as a reminder to take a medication or check blood pressure, can lead to higher levels of engagement and subsequently, lower medical costs. Veroff’s test group of patients received enhanced decision-making support by trained health coaches, while his control group received the usual support. In both cases, the coaches provided the same knowledge and awareness on treatment options and encouraged them to communicate to their health care providers. Patients who received the enhanced decision-making support had 5.3% lower overall medical costs, as well as 12.5% percent fewer hospital admissions and 20.9% fewer preference-sensitive heart surgeries10.

As Conversa grows its reach and patients use the product for longer periods of time, SVF predicts that we will see a similar impact to these studies among Conversa users. Diligent Conversa users should experience fewer preventable complications and reductions in readmissions. This may be caused by greater adherence to health care plans, but also by patients becoming educated enough to be contributors to their plans that work better for their individual needs. Furthermore, we hope to see Conversa catalyze hospital behavior change in the long term, as they incorporate the idea of using technology to improve patient engagement into their organizational strategy and design. In turn, this has the potential to change industry practices and impact health policy in the future.

Patients who received the enhanced decision-making support had 5.3% lower overall medical costs, as well as 12.5% percent fewer hospital admissions and 20.9% fewer preference-sensitive heart surgeries.
LOCKSTEP IMPACT

Companies with impact built into the business model, where impact and profit move in lockstep

While the original SVF impact model is difficult to apply to our portfolio companies targeting a large or ambiguous public problem, like education or healthcare, it is most useful when companies’ impact and profit grow together. In particular, we have found that companies targeting reformist impact via a specific social or environmental challenge (such as low test scores or energy efficiency), while providing a service or a product that directly confronts a symptom of the issue, have more measurable impact. These business models illuminate a clear link between outputs, outcomes, and impact, with additional units of revenue leading to additional units of impact. Four companies in the SVF portfolio—Querium, Powerhouse Dynamics, Dryades Public Market, Chirps, and Court Innovations—fall into this category. Profiled below, Powerhouse Dynamics and Dryades Public Market, and Querium demonstrate how the SVF impact model helps explain the successes (and challenges) facing impact-driven, for-profit businesses.
Example: Powerhouse Dynamics

**Company Overview:** Powerhouse Dynamics’ SiteSage IoT-based platform connects, monitors, analyzes, and controls equipment to deliver enterprise-wide operational efficiencies to portfolios of small commercial facilities, including restaurants, convenience stores, retailers, and others. SiteSage enhances equipment performance, provides operational transparency, and reduces energy expenses. Engineered specifically for smaller facilities, SiteSage features powerful functionality delivered via simple online and mobile interfaces. The system, installed in thousands of restaurants, convenience stores, retailers, and other facilities, continuously enhances efficiencies by controlling major loads, monitoring power consumption and the performance of individual pieces of equipment, and tracking gas and water usage. Customers include retailers such as Ann Taylor and Five Below, as well as restaurants including Arby’s, Dunkin’ Donuts, and Texas Roadhouse.

**Theory of Change:** For small commercial and retail operations aiming to increase their margins or improve their environmental impact, the SiteSage platform offers an opportunity to improve the performance and efficiency of their equipment (for example, HVAC systems or kitchen appliances). This leads to greater efficiency, reduced energy consumption, improved equipment maintenance and fewer failures, and possibly delayed purchases of new equipment. These lead to direct and meaningful savings to the company and ultimately contributes to the reduction of carbon emissions.

**Measuring Impact:**

*Energy Efficiency*
As Powerhouse Dynamics has brought its platform to more than 4,000 locations across North America, its impact continues to scale as a function of energy savings. The table on the next page displays cumulative savings, indicating that over the 5-year lifetime of the company, it has helped save approximately 450 million kWh of energy across its customers’ locations in restaurants and retail shops. Energy savings was calculated using a sample of customers’ difference in month-over-month energy bills.

Comparatively, the average American household uses 10,399 kWh of energy per year. After five years of operations, Powerhouse Dynamics has diverted consumption of energy equal to 43,273 houses annual kWh use—approximately the number of households in Ann Arbor, MI.

For some companies, this has enabled rapid progress toward corporate sustainability goals. In 2018, for example, Powerhouse Dynamics deployed its SiteSage platform in Lush Cosmetics stores and demonstrated 23% energy use reduction across 25 stores. Rolling out SiteSage to 150 stores in the US and Canada will enable Lush to surpass its 2020 sustainability goal of reducing energy consumption by 20% and do so ahead of schedule.
On a macro-level, reduction in energy use contributes to an increase in energy efficiency—a key strategy for curbing emissions, and ultimately climate change, to preserve the planet’s constrained natural resources. Accordingly, more than 30 U.S. states have adopted policies to encourage energy efficiency via utility Energy Efficiency Resource Standards (EERS). According to the Energy Information Administration, “EERS are similar to renewable portfolio standards (RPS), which encourage the adoption of certain renewable energy technologies. Like RPS, EERS often differ in stringency and timing across states. Each state’s targeted electricity savings is different, ranging from 1.0% of prior year sales (in Michigan) to 2.1% of average sales over the prior three years (in Illinois). Among these states, the final year of the standards ranges from 2020 to 2030.” As Powerhouse Dynamics continues to aid companies in meeting their energy efficiency targets, it contributes to broader energy savings goals nationwide.

Reducing Carbon Emissions

The broader environmental and health impact of Powerhouse Dynamics can be assessed via reduction in emissions of carbon dioxide (CO₂) and other pollutants such as sulfur dioxide (SO₂) and nitrogen oxides (NOₓ) as a result of energy savings. Each U.S. state in which the company’s platform is used has a unique energy portfolio, containing different proportions of renewable vs. non-renewable energy sources. In Michigan, for example, utilities are required to source 15% of energy from renewable sources, such as wind and solar, by 2021; however, the remaining 85% may come from carbon-intensive fuels like natural gas and coal or non-emitting sources like nuclear. In order to approximate the emissions reduction correlated with use of Powerhouse Dynamics’ platform, we used yearly state-by-state electricity consumption and emissions data from the U.S. Energy Information Administration (EIA) to calculate national average emissions intensities (metric tons emitted per MWh of electricity consumed) for each of the three primary gases considered. By applying these intensities to the energy savings attributed to Powerhouse Dynamics, we were able to approximate their impact in terms of emissions reduction, which is represented in the chart below. Since its launch in 2012, the use of Powerhouse Dynamics’ platform has resulted in a combined 240,000 metric tons of avoided CO₂ emissions.

Example: Querium

**Company Overview:** Querium helps students master critical science, technology, engineering, and math (STEM) skills, preparing them for college and careers in STEM. The platform delivers personalized lessons with expert, step-by-step tutoring assistance that motivates students to succeed. Designed for digital native students living connected lives, Querium’s patented mobile learning platform delivers personalized short-form lessons and practice tests in STEM subjects like Math and Science. StepWise Virtual Tutor uses AI technology that mimics a master teacher or master tutor and is available 24/7. The platform has many applications, including MathBooster, which helps students identify math gaps prior to the STAAR Algebra 1 EOC assessment and builds their confidence before the test, and Accuplacer Math, which helps incoming college students place out of remedial, non-credit courses prior to entering the Accuplacer math placement test.

**Theory of Change:** The US Department of Education emphasizes the importance of preparing young adults in STEM disciplines for a chance to be future innovators and leaders. Overall jobs are expected to grow by 14% from 2010 to 2020; however, for STEM that ranges from at least 16% (mathematics) to 62% (biomedical engineers). Despite this demonstrated skills demand, only 23% of high school seniors are considered proficient in math. This is due to a lack of access to quality STEM learning opportunities, as well as lack of awareness around the importance of STEM careers for the future.

Querium creates accessible tools to improve skills and test taking in STEM high school classes with the right tools at the right time, targeting high school and college students with a supportive digital platform. The company’s products include standardized and customizable lessons for students preparing for coursework and careers in STEM. By measuring the test score improvements and number of problems completed per student, as discussed below, Querium can track how practice on the platform translates to improved test scores. In the long run, academic success in STEM fields may result in higher student confidence and a reduction in the STEM skills gap across the country.

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Measuring Impact:
Querium’s products use A.I. technology to optimize and individualize online instruction for each student. These products change the current models of online instruction by adding a layer of personalization through new technology. The company partners with schools by utilizing this medium of online instruction to reinforce classroom education, and this hybrid education model is shown to be effective for student success. According to the U.S. Department of Education, “instruction combining online and face-to-face elements had a large advantage relative to purely face-to-face instruction than did purely online instruction.”

In 2017, Querium, supported by the U.S. Department of Education, researched the impact of the StepWise product on 531 students. The study concluded that “treatment students scored approximately 8% higher overall on a standardized geometry readiness test after just 6 weeks of using StepWise… StepWise had a sizable positive effect on the students who previously scored lower on the Smarter Balanced math assessment.” Students who went through the StepWise program scored better on STEM-related topics, driving Querium’s realization of its theory of change.

In assessing the company’s impact, we categorized Querium as a lock-step company because the product’s impact is spread by reaching individual students. Each student who uses Querium’s programs increases its reach incrementally, and growth of the business and impact move in tandem. Querium served over 100,000 students in 2018 and continues to expand, working toward the ultimate goal of closing the STEM education gap.

8% OF STUDENTS
SCORED HIGHER OVERALL ON A STANDARDIZED
GEOMETRY READINESS TEST
AFTER USING STEPWISE FOR 6 WEEKS

15 “Querium - Research Brief - Study of Promise”: StepWise Virtual Tutor for Algebra: The A.I. tutoring system built with the wisdom of master teachers. 2017
Example: Dryades Public Market

**Company Overview:** Originally founded as Jack and Jake’s, Dryades Public Market is a grocery store “food hub” aiming to offer affordable, fresh food and groceries to the Oretha Castle Haley area of New Orleans, LA. Main product categories of the store include produce, meat and seafood, beer and wine, general grocery, and a prepared food hot bar. With a goal of catalyzing further economic development within the community, the business also hosts community events and serves as a gathering space.

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**Theory of Change:** According to the U.S. Department of Agriculture, in 2009, 23.5 million people lived in low-income areas located more than 1 mile from a supermarket or large grocery store. Furthermore, “urban areas with limited food access are characterized by higher levels of racial segregation and greater income inequality,” while “food retailer behavior and supply-side issues such as higher costs to developing stores in underserved areas” sets a high barrier to entry in areas with low access. To address this problem, Dryades sought to open a grocery store in this New Orleans neighborhood in order to improve residents’ access to affordable, healthy food, ultimately leading to the longer term goal of improved equity and public health. This theory of change relies on two important qualities of the business and service it provides: the location of the store and customer decisions on product selection. In the retail industry, product mix has a direct impact on customer purchases: stores that allocate more shelf space toward healthy products prompt more people to purchase them. Theoretically, an increase in the presence of healthy foods drives the outcome of meeting nutritional needs. Dryades illustrates the “lock step” theme in the SVF portfolio, as incremental growth drives incremental impact.

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Measuring Impact:

**EBT Purchases**
The percent of total purchases completed using an EBT card at Dryades signals the number of USDA Nutrition Assistance Program users, and likely food insecure individuals, shopping at the store. According to the Center on Budget and Policy Priorities, the federal Supplemental Nutrition Assistance Program (SNAP) redemptions through EBT card purchases “accounted for approximately 10 percent of the food that U.S. families buy for their homes.” Comparing this national rate to Dryades’ sales, SNAP redemptions accounted for only 4% of expenditures over the trailing 12 months ending in early 2018. This 6% gap indicates that the reach of Dryades products into food insecure communities is lower than the average grocery stores in the United States. This may result from a variety of factors including location, selection decisions, and marketing reach.

**Perishable Food**
On the other hand, the amount of perishable food as a percent of overall purchases indicates that Dryades has been effective in promoting more nutritious food, as opposed to processed food products. While limited information on perishable food consumption exists, SVF utilized Kroger’s financial statements as an indicator of national averages. Kroger’s 2017 perishable sales make up 32% of their total grocery revenues (perishable + non-perishable). In the trailing 12 months ending in early 2018, 33.1% of Dryades purchases occurred in categories most comparable to the perishable categories at Kroger. (Note: Prepared food hot bar and onsite alcohol purchases were removed from the analysis. With the hot bar included, the percentage is significantly higher). This result reveals that Dryades is in line with national averages of perishable purchases, so it is arguable that Dryades customers are, on average, leaving the store with healthier foods than the typical US grocer. However, data on the socioeconomic status of shoppers is unavailable, limiting our inference of impact.

**Impact Challenges:** As an impact investor, SVF seeks to ensure we are doing our part to help our portfolio companies succeed from both financial and impact perspectives. Further, we seek to be partners with our portfolio companies in addressing these challenges through both ad-hoc and formal opportunities (such as our portfolio consulting engagements). Through consulting projects with Dryades, SVF teams identified both challenges and opportunities to support the company as it builds upon its current results. Several of the most pertinent challenges to impact are discussed below.

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**Accessing the Demographic**

Driving impact on improved public health and access to healthy food relies on consumer behavior and personal choices. Reaching food insecure communities can be challenging, as underserved markets are less understood; thus, creating business models that effectively attract food insecure customers and meet their needs is not a well-tread path. Although Dryades has struggled to reach its target customer in the past, the company has launched two new programs – a senior discount day and school lunch vouchers – to attempt to better serve this demographic.

**Product Mix**

Attaining the right product mix is a significant challenge for all food retailers and particularly for those attempting to improve public health with a sustainable business model. The food and beverage industries have been undergoing a period of rapid shifts in consumer needs, with new brands on the horizon, new trends garnering interest, and greater mindfulness of sustainability. Assortment decisions must also balance revenue productivity with impact factors like providing healthy products. Companies like Dryades can use shopper selection decisions to understand what the store means to its customers.

Encouraging healthier consumption through assortment decisions would necessitate decreased shelf-space for products considered less healthy: for Dryades, this may represent a direct tradeoff between impact and profit. Furthermore, the challenge of convincing consumers to purchase healthier options is reinforced by the difficulty of shifting consumer preferences overall. Given that less healthy products often have high sales (even if they are declining), it is challenging to remove them without the guarantee of revenue from healthier products. We look forward to seeing how new initiatives being implemented by Dryades, such as coupons and sales, may alter these tradeoffs and define future sales of their more nutritious foods.

**Competition**

The company has been faced with fundamental business challenges, underscoring the necessity of a deeper business model analysis in concert with impact. For example, when Dryades was first established, the company believed it could meet the needs of neighborhood residents. However, most customers visiting the store today come from outside the neighborhood, and several other chain grocery stores in the area present significant competition. SVF’s experience with Dryades has been a learning opportunity for students and highlighted the importance of profit sustainability as a precursor for impact.

In the trailing 12 months ending in early 2018, 33.1% of Dryades purchases occurred in categories most comparable to the perishable categories at Kroger.
VALUE-ADDED IMPACT INVESTMENTS

Companies that SVF has assisted in measuring impact and decision-making, adding value alongside the financial investment

As MBA, BBA, and dual-degree students with a wide range of expertise, SVF associates engage with portfolio companies each winter term to complete consulting projects on a range of topics, including marketing pricing, strategy, and impact measurement. Contributing additional value alongside the financial investment, these projects support overall capacity building, growth of the business, and progress in the company’s impact mission. Alongside the long tail and lockstep themes that emerged from our portfolio assessment, two companies noted that through these projects, SVF was instrumental in helping their teams measure and convey their impact. In particular, a lifecycle analysis of Chirps’ flagship cricket chip product and an SROI analysis of Court Innovations’ Matterhorn platform stand out as two ways SVF has brought additional value to its portfolio companies.
Example: Chirps (Six Foods)

**Company Overview:** Chirps (Six Foods) is a San Francisco-based consumer packaged food company that manufactures and sells cricket-based protein snacks and products with the goal of catalyzing a more sustainable protein production ecosystem. The company’s beachhead market is the chip snack market; their initial product line consists of three flavors of Chirps Chips, a chip made from cricket flour. Chirps also offers cookie mixes and protein powders, and seeks to expand its offerings to include other alternative protein products.

**Theory of Change:** Chirps seeks to create and grow insect-based protein products to facilitate more sustainable protein food production and consumption practices. They are positioned to capitalize on the growing desire for alternative proteins among health and environmentally conscious consumers, as well as to ignite consumer demand for insect-protein through the sale of Chirps chips, protein powders, and other protein-based products. Falling squarely in SVF’s “long-tail” category of transformative impact, Chirps’ impact can be measured by long-term shifts in consumer preferences and normalization of insect protein. Ultimately, the company aims to promote protein sources that are less harmful to the environment, such as beef, to divert the use of water and other scarce resources.

**Measuring Impact:** Chirps’ cricket-based products address two major environmental challenges: climate change and water scarcity. Food production is central to both global issues. Chirps is tackling these problems by reducing the greenhouse gas (GHG) emission and water-intensity of food production. With the world population expected to rise to 9.7 billion by 2050, the issue of sustainably producing adequate protein for populations around the globe is becoming increasingly pressing. The United Nations has identified entomophagy as a key opportunity for enhancing food security for the world’s growing population while reducing environmental impacts.20

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Chirps’ primary impact lever is replacing animal protein products with cricket protein products. This creates positive environmental impact through three distinct mechanisms, each resting on the notion that crickets produce less greenhouse gas and require less water per pound of protein than animal protein sources that exist today:

- The production of livestock for animal meat or animal byproduct consumption creates methane, a potent greenhouse gas. Simply reducing the number of livestock on the planet (by displacing them with crickets, which produce significantly less greenhouse gas per pound of protein) directly reduces overall greenhouse gas emissions.

- Livestock require significant water inputs to produce feed. Simply reducing the number of livestock on the planet (by displacing them with crickets, which require significantly less water per pound of protein) directly reduces overall water withdrawals and mitigates water scarcity.

- Cricket production diverts food scraps from landfills by using food scraps as feed for crickets. Food scraps decompose in anaerobic conditions in landfills and, thus, produce methane, a potent greenhouse gas. Thus, diverting food scraps from landfills mitigates greenhouse gas emissions.
Discussed in this report, SVF performed a lifecycle assessment (LCA) of cricket farming in Thailand in SimaPro based on a study conducted by Halloran, et al. The results show that producing one kilogram of dry, processed cricket in this context emits 2.45 kilogram of carbon dioxide equivalent (CO2eq). A large majority of this carbon footprint is due to the inputs and production of cricket feed, which is essentially the same as chicken feed. Other inputs, such as electricity to operate the facility where crickets are raised and processed, are much less significant, indicating that the largest opportunity to improve sustainability is switching feed sources to alternatives like human food waste. This flow diagram shows the most significant inputs required to produce 1 kg of dry, processed crickets. The threshold set for this particular subset of the inputs was 5%, meaning that any input that contributes 5% or more of the final carbon emissions is included and anything below that threshold is omitted for simplicity.
Portfolio Consulting Project: In 2019, SVF completed a consulting project with Chirps with the goal of improving the company’s understanding of the environmental impact of its supply chain. This analysis aimed to inform future ingredient sourcing decisions for crickets, which are used in all products and other key ingredients specifically for Chirps Chips.

To assess the impact of the cricket powder used in Chirps’ products, the team implemented a life cycle assessment of a cricket farm in Thailand using SimaPro software to approximate the environmental impact of Chirps’ current cricket supplier. The scope of the model spanned from “cradle to gate”, or rather, from raw material production and resource extraction until the processed cricket powder leaves the farm’s facility. This model was used as a base case for a cricket farm that does not require any facility heating.

In cold climates, cricket farms must heat their facilities to 85-95°F. To approximate the additional impact from heating for a cricket farm in North America, the team calculated the associated carbon emissions using estimates of the facility’s size and material composition along with average ambient temperatures in the area. By adding the resultant emissions from heating to the base case from Thailand, we have an idea of the increased impact of a cricket farm in a cold climate.

Additionally, the team examined the impact of transportation of cricket powder from both Thailand and North America to Chirps’ manufacturing facility in California. Crickets from Thailand are transported to the United States via cargo ship and then delivered a short distance from the port to the manufacturing facility by truck. In comparison, crickets from North America are transported entirely by truck. Despite the overall longer shipping distance from Thailand, it is less carbon intensive since the route is mostly via ocean freighter, which is a more efficient form of transportation due to its higher capacity and utilization rates.

In this comparison, the Thai farm is a clear winner because it does not require heating and offers lower carbon output from transportation. To support future sourcing decisions, the team also built a simple model that will allow Chirps to input data about facility size, insulation, ambient temperature, transportation methods, and distance to understand the comparative carbon footprint of heating and shipping for any cricket farms of their choosing.

Lastly, the team also utilized secondary research to assess the environmental impact of other key ingredients in Chirps Chips, including corn, oil, and pea flour across metrics of greenhouse gas emissions, land use, and water use. Based on the findings, the team was able to make recommendations as to which levers Chirps can pull to improve the environmental footprint of their ingredient sourcing.

Example: Court Innovations

Company Overview: Matterhorn, an online dispute resolution platform, enables courts to offer online access to handle high-volume infractions and misdemeanors. Matterhorn-enabled courts allow the public to contest and resolve some citations, warrants, and civil cases issues online instead of attending court in person, saving litigants and courts time and money. Supporting those who are not traditionally well served by courts and those who may have difficulty appearing in court, Matterhorn’s 24/7 access and education components empower litigants to resolve minor violations informally, conveniently, and equitably. The company, Court Innovations Inc., and product, Matterhorn, seek to improve access to justice, defined by the U.S. Department of Justice as “delivering outcomes that are fair and accessible to all, irrespective of wealth and status.”

ACCESS TO JUSTICE PRINCIPLES

- **Promoting Accessibility** – eliminating barriers that prevent people from understanding and exercising their rights.
- **Ensuring Fairness** – delivering fair and just outcomes for all parties, including those facing financial and other disadvantages.
- **Increasing Efficiency** – delivering fair and just outcomes effectively, without waste or duplication.

Measuring Impact:
Since 2014, the reach of Matterhorn has grown significantly, expanding from 7 Michigan courts in 2015 to 54 courts across 10 states by the end of 2018. Cumulatively, approximately 57,000 cases have been handled by these courts on the Matterhorn platform. Most of the cases handled are related to traffic violations, but a significant number of warrant cases and family hearings have also been processed. These latter categories of cases are significant because they create an outsized impact for both courts and citizens in terms of the financial and time costs associated with processing them by normal, offline means. Matterhorn drives reformist impact by improving access to the justice system, though change to the justice system itself must come from governmental action.

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23 “Access to Justice.”
The functionality of the Matterhorn platform has also expanded in the past four years. Most recently, Matterhorn has added an ability to pay assessment tool that courts can use to better understand the financial circumstances of citizens that are working through tickets and court cases. This improved transparency helps courts to “right-size” penalties (for example, to ensure that a traffic ticket fine does not create a disproportionate burden for a low-income individual) and to provide more flexible options, such as payment plans.

**Customer Impact - Courts and Law Enforcement:**

The first level of impact that Matterhorn drives occurs directly with customers and affiliates – specifically, the courts that license and use the platform, as well as the law enforcement officials that appear in court for these cases on a regular basis. By processing cases online, courts gain two benefits. At a minimum, the hours spent administering these cases are reduced. Beyond this, the online platform allows courts to avoid even more cumbersome processes such as hearings and collections processes, which often occur specifically when individuals dealing with minor infractions are not able to navigate or immediately pay for legal fees related to their cases. The online platform allows for more accessible, transparent communication between citizens and courts, which reduces resource waste on follow-ups for the courts.
On average, courts using Matterhorn have been able to reduce traffic violation hearings by 24%; moreover, for these courts, the number of fine payments made within 30 days has increased from 51% to 92%. These reductions generate time and cost savings for courts and law enforcement. These savings allow staff to put their resources to more productive use, such as more efficiently focusing on and processing complex cases that cannot be resolved online or spending more time on patrol or community outreach. Cases involving warrants have a particularly large impact in this area, due to the added staff time associated with making and processing arrests.

Since 2014, Matterhorn has helped courts to resolve 2,990 warrants, and has helped to prevent another 1,760 warrants (1,225 traffic warrants and 535 family case warrants). Based on the SROI analysis from the SVF tool (discussed in this report below) the cost and time savings driven by resolved and avoided warrants handled on Matterhorn since 2014 is roughly $1.4 million and more than 20,000 hours of officer time. Importantly, these figures comprise only a portion of the impact of the Matterhorn platform, as they do not consider the losses that are avoided for citizens working through case processes that involve court appearances or arrests.

For courts using Matterhorn, the number of fine payments made within 30 days has increased from **51% to 92%**.
User Impact-Citizens:
The second level of impact that Matterhorn drives occurs directly with community members, specifically litigants of lower socio-economic status and those who bear the brunt of racially disparate outcomes as it relates to law enforcement and court interactions. By processing cases online, courts mitigate economic impact in three major ways, reducing childcare expenses, travel expenses, and lost wages. As estimated by SVF’s SROI tool, use of Matterhorn has saved litigants an estimated $800,000 in these three areas, while also saving litigants over $143 million in avoided wages lost due to criminal records.

Matterhorn’s platform also offers broader benefits that in-person appearances cannot (or are challenged to) provide. Staff communication centrally located online helps to provide a higher quality, frequency, and consistency. Remote access on Matterhorn’s 24/7 platform increases litigant accessibility to information, as it offers extended hours and meets the needs of litigants with limited English proficiency, as Matterhorn can be set to display in multiple languages. Communication and access to information is also enhanced via email and text notifications, short, focused videos, and real-time communication with experienced staff. The Matterhorn platform also offers users a greater degree of privacy and less traumatic mechanisms for processing infractions.
**Portfolio Consulting Project:**
In 2018, SVF created a Social Return on Investment (SROI) model to better align socio-economic outcomes of Matterhorn with traditional financial metrics. The model leveraged Matterhorn’s data on the volume of cases, warrants, and hearings across courts to determine a total SROI, factoring in growth over time and a discount rate of 50%. The team researched assumptions and assigned dollar values to the average cost of child care, travel, and fines for civil infractions, as well as minimum wage, to paint an accurate picture of diverted costs to litigants, courts, and taxpayers.

**MEASURING BENEFITS**

- **Enterprise economic benefits:** result in improved economic performance for the organization. In this case, Matterhorn improved efficiency of the court system by saving costs to courts via reduced defaults, reduced late payments, reduction in the number of hearings, and reduction in time per hearing.

- **Socio-economic benefits:** result in measurable economic benefits to society. Matterhorn saved costs for litigants, including day care, travel, lost wages, and penalty fees; the platform also saves costs for taxpayers in the form of avoided arrests and jail expenses.

- **Social benefits:** provide improvements that cannot be measured. As discussed in this report, the benefits of improving access to justice include ensuring fairness and equity among Americans, regardless of socio-economic status, race, gender, ethnicity, sexual orientation, or geographic location.

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**Example (not actual data— for illustrative purposes only)**

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TEN YEARS:
LESSONS LEARNED
Looking back on the last ten years of SVF’s experience in impact investing, several key takeaways stand out that may inform future investments and work with portfolio companies.

Inability to measure short-term impact shouldn’t disqualify a company from investment.

Viewing our deal flow through the lens of the reformist and transformative impact framework, it is unrealistic for every company to have clearly defined and measured impact metrics at the time of our investment. For instance, the long-term goal of LearnZillion – to change how curriculum is delivered to students – can only truly be evaluated retrospectively, years from now. Thinking only in the short-term discounts the importance of driving broader sector and system-level change. Ideally, then, the SVF portfolio would have a healthy balance of companies with measurable short-term impact (likely falling into the reformist category) and those with long-term missions, complementing one another to attack a problem from multiple angles.

SVF can add more value to its financial investments by helping investees articulate impact.

Many startups that SVF invests in struggle to keep track of impact related metrics – not because impact is not a part of the business model or because the founders are not impact focused, but rather as a result of constrained time and resources. For early stage companies growing quickly on a budget, impact data is often a “want to have” as opposed to a “need to have.” As MBAs and BBAs with broad experience, SVF has the potential to add value in this area. Future projects could include gathering impact data for these companies, doing the upfront work that would allow companies to track data in sustainable way, and building impact models such as those created for Chirps and Court Innovations. More specifically, SVF should explore different technology platforms for tracking data to support more nuanced and less burdensome data collection process.

Further, SVF adds the most value when it is able to complete a series of related projects for a company. In the future, we should attempt to map out a scope and sequence of impact-related projects for a company, as opposed to completing one-off engagements. A first project, for example, could focus on determining impact metrics and collecting data on them, followed by another project centering around analyzing that data and defining the company’s impact. SVF can encourage a company to consider the impact of their own operations, in addition to their broader mission. We should push our portfolio companies to look internally for impact opportunities, as they generally have more direct control over these elements of the business.
Define a proxy measure for impact for difficult-to-document metrics.

For some companies, privacy concerns prevent us from obtaining data on company outputs and outcomes (in particular, court-related and healthcare-related data). SVF and the company must rely ultimately on assumptions and estimates for impact on the end user. This underscores that during the diligence process, teams must seek to understand the position and role of the company among all actors trying to solve the problem: is the company seeking reformist impact and addressing a symptom, or does it aim to drive transformative change within a sector?

For example, when developing the Court Innovations SROI model, the team had ample data on customer impact (time and cost savings to courts and law enforcement), but had to rely on assumptions and estimates for what the impact is on the end user (citizen). Arguably, the citizen impact is the most important component of the access to justice challenge; however, it is difficult and would be inappropriate to collect data about citizen’s income levels, gender, race, type of case, feedback on platform, etc. The key challenge then becomes: how do we make sure we are serving these individuals appropriately and making an impact when privacy is a key component of their process? Proxies, such as external research on average incomes in a particular zip code, can help fill this void. Other qualitative metrics raise a similar question, such as reducing the psychological effects of dealing with an unjust court system.

Impact can’t happen without a viable business model.

Finally, a company with a legitimate theory of change can stumble when confronted with business challenges — and frankly, a company can’t have impact if it doesn’t stay in business. Although SVF is an impact investing fund, the due diligence process must appropriately weigh impact with potential for business success. We don’t believe there is an inherent tradeoff between financial gain and impact. In fact, we think it is critical to verify that the theory of change aligns with a sound business model before making an investment.
## Recommendations

In another decade, we hope to see SVF’s portfolio companies driving impact across sectors, as well as complementing one another as reformist and transformational enterprises. The process of creating this report yielded several recommendations to help the Fund reach its next stage.

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<tr>
<th><strong>Simplify the Impact Model to Account for Lack of Data.</strong></th>
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<td>Availability of data that directly links to key impact metrics was a hurdle in assessing the impact of each of the portfolio companies. While it is appealing to have a single number value of impact – such as an impact money multiple or SROI – to compare to financial and accounting metrics, this number does not tell the full story of a company’s impact. SVF should consider whether the current framework delivers the end goal of measuring impact in a useful way. When performing due diligence, use logic and intuition; as discussed in the lessons learned, it is not necessarily a red flag if all the right data isn’t immediately available.</td>
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<th><strong>Evaluate the Founder’s Involvement in the Field and Passion for the Theory of Change.</strong></th>
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<td>In our experience, companies tend to be more impactful (and profitable) when the founder (or other executive leader) has a personal passion or extensive experience addressing the social or environmental challenge. The best solutions are derived from deep understanding of the problem; for example, the Powerhouse Dynamics CEO joined the company after years developing innovative technologies to mitigate climate change. These companies also tend to have a more in-depth understanding of how to measure impact, as well as how impact is connected to the business model. The pre-investment diligence process should assess where the leadership sees the company going in the long-term to evaluate commitment to reformist or transformational impact.</td>
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<th><strong>Invest in Companies That Complement One Another on Solving Social and Environmental Challenges.</strong></th>
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<td>Lastly, a key takeaway of this assessment was the importance of understanding if a company’s value proposition addresses a root cause or symptom of a problem. Both are important angles, and we suggest SVF develop its portfolio to maximize for impact by investing in companies that complement one another on the same social or environmental challenge. The sectors SVF invests in are crowded spaces, so SVF should discuss whether a potential investment is driving reformist vs. transformational change, considering where the company fits in the broader landscape of the issue it is addressing. As conveyed in this report, impact can be measured in many ways; however, SVF will be unable to tout its impact without a better understanding of the problems it is attempting to solve via investing. Leveraging the current circle model, this should become a more important component of the due diligence process and lead to refining our investment thesis.</td>
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ABOUT THE SOCIAL VENTURE FUND

Launched in September 2009 by a group of MBA students, the University of Michigan Social Venture Fund (SVF) invests in and supports innovative companies that place social impact at the heart of their business model. SVF fosters the growth of enterprises responding to societal needs that traditional markets have insufficiently addressed. As the first student-run social venture fund in the country, SVF provides an unparalleled action-based learning experience, which places equal importance on maximizing financial returns and socially/environmentally-driven venture investing and entrepreneurship. The fund is housed within the Zell Lurie Institute for Entrepreneurial Studies at the Ross School of Business.

INVESTMENT PHILOSOPHY

The Social Venture Fund focuses exclusively on for-profit enterprises that are committed to positive and measurable social or environmental impact. In evaluating potential investments, we employ rigorous social and financial valuation metrics to ensure that companies have the potential to provide a strong blended social and financial return.

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