The Myko Social Score Platform

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SPF Final Report Project 0130

Myko is an iOS and web-based application that scores everyday choices based on their impacts upon environmental and social sustainability using a lifecycle impact algorithm developed at McGill. Myko's habit-based framework enables users to commit to change, track their footprint, and share their progress. Our goal is to shift social behaviour toward sustainability.

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1. About Myko

Mission

To shift social behaviour toward sustainability by empowering users with a real-time score that measures the impact of their daily choices.

Vision

We are working toward a sustainable economy in which everyone is aware of the environmental, health and community impacts of each choice made and responds to a scoring signal that keeps us all within the ecological boundaries of the Earth.

Summary of Project

Myko is a mobile and web-based application that allows users to monitor the impacts of their daily choices and nudges them to act more sustainably by selecting and completing suggested commitments. A 'social score' is provided for each of the 120 commitments listed on the app. That score is intended to give users a second signal, parallel to the price signal, that represents the social, environmental and health impacts of their choices, and allows them to adjust behavioural habits based on their relative sustainability. They worked together with professional app developers under the leadership of Professor Richard Janda of the Faculty of Law. In 2014, Myko received $75,000 funding from the McGill Office of Sustainability and $25,000 from the Hydro Quebec Sustainable Development Scholar fund. Myko users choose energy, food, waste, water, health, social, and consumption habits to monitor: for example, "keep showers under five minutes" or "eat no red meat." Once a day they then "swipe" right to indicate that they have completed the commitment, or left to indicate that they missed a day. They then receive a score, a breakdown of impact metrics, and a relative ranking on a leaderboard, which is also broken down by residence. The Myko score aggregates metrics for biocapacity of land, greenhouse gas emissions, solid waste production, energy use, water consumption, health effects, and social connectivity. In its test version for the McGill campus, Myko's Discover tab of the app shows the real-time energy use of all McGill buildings and shows users an interactive map of both McGill campuses. Data from the Bixi app is also incorporated here, allowing users to find information on availability of bikes at nearby Bixi stations to encourage cycling as a sustainable mode of transportation. In the future, this feature of the app will connect users to their surroundings wherever they are. A Greenwall allows users to post results, photos and comments, providing an online community for interaction between users. The project's key and tested premise, drawn from an experiment conducted at the Faculty of Law in 2013, is that users will respond to a real-time signal of their impacts by shifting their behaviour toward increasingly sustainable choices. The Myko model of self-regulation also draws on the success of "quantified self" apps notably in the health and fitness realms. Myko is the Greek word for fungus. Fungi and lichen are among nature's most sensitive bio-indicators: they register human impacts on the environment and signal back to us the health of the ecosystem. The name was selected after conducting focus groups with McGill students.

What problem is Myko solving?

Even when individuals and enterprises acknowledge that the choices they make can have a wide range of environmental, health, labour, and human rights impacts, they find it challenging to make sense of these impacts and to take account of the many aspects of sustainability. Indeed, they sometimes can (i) be unwilling to make sacrifices and changes in the absence of personal gain, (ii) be reluctant to pursue remedial action where consequences are not felt within the physical or psychological proximity of the individual concerned, and (iii) feel unable to connect their own small aggregate impact savings to broader collective outcomes. Myko provides a trustworthy signal, an engaging interface, and incentives to empower users to surmount these challenges both individually and collectively.

Key results

After nine months in development, Myko went live on the Apple App store in December 2014. This meant that we actually got further than we had expected with the funds from the SPF, since we now have more than an app prototype and indeed have a working platform with a sophisticated impact algorithm developed by our student team. Myko got featured in a *Montreal Gazette* article which commented that: “"The genius of Myko is that it makes a game of improved sustainability habits." It was rolled out in the McGill residences as part of the “Fight the Power” energy saving campaign in February 2015, gaining 513 users and showing that its use correlated with energy reductions in residence buildings. In January 2015, Compass Food Group, the campus catering company, chose Myko as its McGill Focus initiative on sustainability. Compass and the McGill Food and Dining Services will work with us over the summer to implement a methodology for gathering point of sale score for Myko users in McGill cafeterias. We have also come to an agreement with OOHLALA, the company that developed the McGill app, to have Myko scores displayed as a tile on that app and to have Myko connect its McGill users to the OOHLALA platform. On March 27, 2015 we were informed that Myko had won the 2015 “Connected to the Community” award from the Canadian Wireless Telecommunications Association, which recognizes the use of wireless technology for the benefit of the community. We have also been informed by the McGill Office of Sustainability that our student team won the Catalyst Award for applied student research. Finally, we were selected as among the second round finalists for the ongoing McGill Dobson Cup in the category of social enterprise.

Stakeholders impacted

From the beginning, Myko’s stakeholders have been the members of the McGill community. We designed the interface and selected the habits to be monitored in accordance with and indeed to further the aims of McGill Vision 2020 Sustainability Plan. We have been able to reach out to and gain tremendous support from the McGill Residences (David Balcombe and Simone Poitrimolt), which helped to fund our Fight the Power (Jessica Goldson, Liam Kirkpatrick, Fiona McRaith) collaboration by contributing $3000 for adaptation of the interface. The backing of McGill Food and Dining Services (Oliver de Volpi and Suzana Bubic) as well as the McGill

Food Systems Project allowed Myko to be selected by Compass Food Group (Eli Bamfo), the campus catering service, as its Focus initiative on sustainability for the McGill Campus. To date, we have been promised $5000 from Compass toward marketing Myko for a full launch to the McGill campus in the Fall of 2015, and we have been promised access to data from food inventories and cash registers in order to generate Myko scores for users at point of sale in all McGill cafeterias. The McGill Utilities and Energy Management (Denis Mondou and Jerome Conraud) has allowed Myko access to the Pulse dashboard and was instrumental in generating data for Fight the Power. In addition, we have reached out to the McGill bookstore (Jason Kack and Steve Allan) and received agreement in principle to roll out Myko there in the Fall. We have met with McGill Procurement (Stephanie Leclerc), McGill Student Health Services (Amanda Unruh), and Student Involvement and Assessment (Lina DiGenova) to plan extending Myko in the Fall, including to the sustainable procurement and to the McGill co-curricular record.

What's next?

Now that we have a working, stable platform we can make it more immersive, engaging and meaningful before a major launch to the entire McGill campus in the Fall of 2015. We will make the app more immersive by having users generate score automatically as they interact with a smart campus. The user experience will shift from having to enter data in order to get score, to receiving score automatically at point of sale as well, through sensors and QR codes deployed in spaces throughout the campus (e.g. at recycling bins, locations of energy use) and using sensors built into intelligent phones and wearable devices. Myko will become more engaging through the gamification of score results and the representation of a virtual world reflecting user behaviour back to each citizen of Myko. The app will become more meaningful to users by connecting score to collective challenges as well as individual incentives. The goal is to build a virtuous circle allowing positive scores to unlock rewards that further contribute to sustainability. Matt Hill of OneTreePlanted, who also teaches Marketing Research at the Desautels Faculty of Management, has agreed to work with us to develop a way for Myko users to plant trees with their score. Using this test case, we will look for other opportunities to produce further positive social-impact outcomes. For example, we will seek to extend Myko's involvement with Fight the Power application as to be able to finance investments in further energy savings – perhaps the installation of solar panels in residences – on the strength of user reductions in energy use. We also have agreement from McGill's Executive Chef Oliver de Volpi to provide cafeteria incentives for fulfilling sustainable food commitments (e.g. a free "Meatless Monday" meal for having participated consistently).

2. The Myko Team

Other Myko team members

Myko has a multi-disciplinary team with complementary skill sets and a strong set of managers with long-term commitment. Professor Richard Janda, Myko Team Leader, brings his work on real-time law and public goods networks as well as a strong set of connections across the McGill campus. Shy Kurtz, Myko's Director of Strategic Planning, is a former student of Richard Janda's and a successful social entrepreneur. He is the Trustee of Justice Trading Ltd., which provides a large array of essential medicines for the

purposes of international humanitarian aid and emergency relief in third-world countries. Jack Melech, Myko's Project Manager, has twenty-five years of experience as an electrical engineer with major firms such as Intel and with hardware and software startups. Manuel Loigeret, who is the Principal of Sparq Studio, is our Chief Programmer. Guillaume Béal, who graduated with an LL.M. from the Law Faculty in 2014, before which he ran his own software company, is our Database Programmer. Michaël Lessard, who is Executive Editor of the McGill International Journal of Sustainable Development Law and Policy, is our Communications Director. Mathieu Lamarche, who has worked with UbiSoft and other major firms as a game designer, has agreed to come on board as our Gamification Director. Juan Pinto, his doctoral student, is Myko's Research Director and is writing his thesis on the law and behavioural economics of nudges and incentives. Carolina Cruz-Vinaccia, a McGill Law LL.M. graduate who is currently pursuing further graduate work in environmental assessment, is our Algorithm Research Coordinator. Etienne Ravilet Guzman, a current McGill law student, also worked on the algorithm and is now the Myko Community Manager. Naomi Hill, a political science major, came to Myko from the McGill Food Systems Project and is our Campus Coordinator. Bronwen Tucker was a key member of our algorithm team. Kendra Pomerantz, a graduate in Environmental Sciences and Management, was our previous Communications Director.

Advisory Committee

We operate under the guidance of a distinguished advisory committee: Annalise Acorn [Law, University of Alberta], Jeffrey Blum [Electrical and Computer Engineering, McGill], Marc-Etienne Brunet [Co-founder and past-Coordinator McGill Energy Project], Allison Christians [Law, McGill University], Jeremy Cooperstock [Electrical and Computer Engineering, McGill], Dror Etzion [Desautels Faculty of Management, McGill], Jameson Jones-Doyle [Sustainability Consultant], Bärbel Knauper [Department of Psychology, McGill], Kathleen Ng [Senior Sustainability Officer, McGill], Louise Lockhart [Student Health Services, McGill], Derrick Wong [Commercialization Officer, McGill].

3. Users and Customers

Who are the target users?

Our primary target group of users is Millennials: young (18-35), tech-savvy, environmentally-aware people, a segment of the population that according to a 2012 BCG Study will be the majority in North America within fifteen years.

> Millennials believe that working for causes is an integral part of life, and they are drawn to big issues. Instead of making one-off charitable donations in cash or in kind, they're more likely to integrate their causes into daily life by buying products that support sustainable farming or "fair trade" principles or by joining large movements that aim to solve social or environmental problems.
>
> Boston Consulting Group, *The Millenial Consumer* (2012)

The first stage test group for Myko is university students. Our immediate market is the McGill Community, which numbers close to 40,000 students and some 5000 faculty and staff members. Based on the February pilot launch of Myko among 3,000 students in undergraduate residences, the app achieved a subscription rate of 17%, thereby setting a threshold McGill target of 7500 users for the Fall of 2015 – a figure that we will aim to double by enhancements to the platform and an aggressive marketing strategy. In particular, it will be crucial for us to have Myko become available on Android so as to reach that important user community more readily than through our existing webapp.

Our intermediate market, North American university campuses, has 1.8 million students in Canada and 21 million students in the United States. Team Myko is currently negotiating a partnership with the University of New Brunswick for a campus launch there, and has initiated a discussion with the University of Haifa. Discussions are also underway with the city of Saint John, which expressed interest in linking the platform to its own smart city initiatives once we have achieved proof of concept on the McGill and UNB campuses. Our goal is to gain a critical mass among millenials and then extend to the population at large.

Who are the target customers?

Our initial target market is university campuses, followed by public institutions such as towns or school boards, and ultimately private business seeking to come on to our platform. In the emerging Internet of Things, firms are already making significant investments in gathering data about the lifecycle impacts of products. According to a 2014 Report from the Visiongain Consulting Group, the value of the world market for food traceability technologies in 2015 will reach USD 11.15 bn in response to a consumer shift to environmentally sustainable lifestyles and a desire to know the origins of food. Myko seeks to become the aggregator of and signal provider for lifecycle impact data. This opens a broad market for the provision and analysis of social score that is dependent upon reaching a critical mass of users. Potential revenue streams include the licensing of Myko to organizations, municipalities companies and selling market analysis reports derived from Myko data. The proceeds from potential licensing fees and market analysis reports will enable Myko to finance the improvement of the platform.

4. Risk Factors

Failure to reach critical mass

The primary risk confronting Myko is that we fail to reach the critical mass of users necessary to produce the network efforts sought. We have planned to mitigate this risk by seeking to generate critical mass on a small scale and then scaling up. By launching on campuses rather than to the world at large, we will concentrate on producing a demonstration effect from which we can learn how Myko can go viral off-campus. We will also use our campus living labs to test which sets of incentives and what kinds of gaming interfaces attract the highest levels of use.

Failure to keep users engaged

A second related risk is that even if we generate a critical mass of users, we may not be able to keep users engaged. The next phase of app development will therefore focus heavily on user engagement: gamification and incentives.

5. Competition

There are a few other applications and platforms with similar technical characteristics and goals to those of Myko and seek to present to the user the impact of their decisions in real time. These are: AllGreenUp, GoodCoin, Joulebug, GreenNexxus, Good Guide and Oroeco.

Like Myko, AllGreenup provides to its users a wide range of sustainable activities and decisions that generate a score when they are carried out. However, Myko utilizes six different evaluation metrics (water use, greenhouse gas emissions, biocapacity of land, energy use, solid waste, health and social connectivity) to score each individual decision, while AllGreenup only uses greenhouse gas emissions, In our judgment this narrows far to sharply the possible analysis of related behaviours. We want to learn about how some forms of impact reduction connect to others. Furthermore, AllGreenup and GoodCoin only focus, at the moment, on a narrow set of behaviours and rely on third-party apps to account for other behaviours. In contrast, the Myko app uses 120 habits divided in eight categories (Energy, Social Connectivity, Water, Waste, Transportation, Health, Consumption and Food) to determine the impact of the choices and decisions. GoodCoin does not seek to provide impact metrics at all and instead seeks to create a market for companies to purchase “goodcoins” to reward positive behavior. GoodCoin also requires that users purchase sensors in order to capture data. Joulebug focuses exclusively on energy use and has a confusing user interface. GreenNexxus seeks only to quantify the number of “green” acts rather than to produce an impact score. Oroeco, with which we are exploring a direct collaboration, was launched at Berkeley and generates carbon footprint information collected via Mint, an online budgeting tool that tracks consumption decisions made using banking information. However, Oroeco does not purport to generate data and scoring as granular as that of Myko and, like Allgreenup and Joulebug, focuses on a single impact metric. Finally GoodGuide, the Chief Scientist of which, Bill Pease, we consulted early in the project, focuses on scoring consumer products and has an application program interface (API) we may seek to use for Myko.

6. Marketing

We learned during our Fight the Power residence launch that “traditional” campus marketing campaigns (setting up tables in residences to promote Myko, distributing flyers and stickers, preparing promotional videos and gaining access to residence screens to advertise Myko) needs to be supplemented by a sophisticated social media campaign. Our Communications Director Michaël Lessard tested the use of Facebook events and a contest to bring friends on to Myko and did produce a spike in downloads. We calaculate that we will have to spend $15,000 on marketing in 2015, including search engine optimization, website redesign to drive

users to the app, targeted advertising for example through Facebook and further promotional videos. We will continue to use traditional marketing techniques and will seek in particular to get a burst of coverage in campus media in conjunction with our Fall launch and will take advantage of our partnership with OOHLALA to ensure that promotion of the McGill app also promotes Myko. Our relationship with Compass will allow us to promote Myko in the McGill cafeterias and we will continue to be part of the Fight the Power campaign, thereby promoting Myko in residences.

7. Business and Financial Plan

Changes in budget compared to original plan

We are proud that we were able to stay within budget and produce far more than we had hoped to accomplish in our original proposal. We had expected to develop a prototype for the app and in fact have gone all the way to launching the app on the iOS App store and having a working platform available on the web. The main change in spending was that we dropped for now the Android version of the app and left it for future development in order to be able to spend more of our budget on student research and the development of the architecture of the algorithm. That architecture is a very important innovation and allows us to bring together multiple indicators into a single, credible and meaningful score. Producing the algorithm proved to be more challenging than we originally believed, but it was a critical investment for the future of the project. We also devoted fewer resources to hardware than originally budgeted again for the sake of investing in the algorithm.

The not-for-profit Myko Social Score Platform

We are currently in consultation with Derrick Wong of the Office of Sponsored Research, but our working plan is to establish Myko as a not-for-profit corporation running the scoring algorithm and protecting user data. McGill will assist us in the legal process of establishing copyright and trade secret for the algorithm and data gathering systems of the platform. Myko will remain a free app and Myko will by governed by users for users. We have explored patent registration and have the steps in view for not-for-profit incorporation. If the algorithm is to become the basis for a signalling and coordination mechanism optimizing social impacts, it must attract the highest possible levels of public confidence. This entails that the following guarantees to users must be subject to clear disclosure and accountability:

Purpose:

The scoring algorithm itself remains entirely dedicated to measuring and coordinating social impacts. Exclusively public purpose is key to user adoption of the platform.

Privacy:

Data collected for the scoring algorithm is completely under user control. Users must have full access to their own data and be given informed choice about its availability to others.

Governance:

Life cycle impact metrics are drawn from the best available scientific data as overseen by a blue ribbon panel accountable to users. The weight accorded to social impacts is determined by the user community.

The income stream to the not-for-profit Myko Social Score Platform would come from licensing arrangements that it would ultimately have with the for-profit Technology Innovation for Social Enterprise (TISE) Design Centre we are planning to incorporate separately as a benefit corporation. McGill University and potentially other universities, notably UNB, linked to the funding of the social score algorithm would receive a percentage of licensing revenues once Myko has achieved minimum efficient scale in algorithm deployment. A target number of users could be set (e.g. 500,000) to trigger the diversion of a percentage of licensing revenues to the universities. By law, this cannot be structured as a distribution from the not-for-profit but would have to be structured as the university's ownership interest in the underlying IP.

In distinguishing the intellectual property in the social score algorithm pooled in the not-for-profit Myko Social Score Platform, the following definition will be used:

Where will we get financing?

In light of the progress we have made with Myko to date, we will apply to the McGill Office of Sustainability to re-apply for funding

> The social score algorithm includes all IP relating to the measurement and representation of material environmental, health and social impacts of behaviour to produce social score, as well as the signaling of optimal collective choices through social score and accompanying incentives. The algorithm will include the methodology for analyzing all data from user transactions and interactions so as to refine scores reflexively and nudge behaviour through incentives.

for an additional year. We will seek a similar level of funding to last year ($75,000-$100,000). We have used all of the funding available through the Hydro Quebec Sustainable Development Scholar Fund. This year we have received modest funding from Compass ($5000) for marketing and a small injection from the McGill Residences ($3000) for residence-specific app programming. We are making research and other grant applications, although their success is indeterminate.

Appendices

Budget 2014

Description Budget Line	Projected expenses in SPF Application	Actual expenses according to SPF Administrator and Hydro Quebec Administrator
Campus Project Coordinator - Stakeholder Engagement - Sustainability Metrics - Student Involvement Coordination - Infrastructure and communications Coordination -Secretary of the Governance Committee	$10,000	$10,000
Project Manager -Initial Scoping -BRD -Pre-app engagement, -MVP determination -DataServices and App development coordination. -Student Involvement Coordination (IT and Programing)	$20,000	$ 20,000
DataServices & Algorithm Development	$11,500	Please see note 1
iPhone App Development (Sparq Studio)	$11,500	$17,591.19 Please see note 2
Android App Development	$7,000	$ 0 Please see note 3
Website and Web-app development	$5,000	Please see note 4
Communications, campaigns and social media management	Please see note 5	$ 3,741
Student Involvement-Student Research hours paid (including benefits)	$15,000	$ 35,004.2
Hardware, monitors, phones, access cards, printing & stationary, miscellaneous	$15,000	$ 3,844.37 Please see notes 2 and 5
Funds Requested from SPF Hydro Quebec Funds Total Fund available	$75,000 $20,000 $95,000	$ 78,363.75 $ 21,248.65 $ 99,612.04

Notes

Note 1: The costs associated with this budget line are already included in the Student Involvement-Student Research budget line. Research Assistants of the Design & Development and Algorithm Design teams were paid to develop these tasks. This includes the design on the database, back-end interphase and analytics tools.

Note 2: The development of the iOS based prototype (Minimum Viable Product as stated in our initial application) required additional work hours in order to increase its functionality and features. This increased the cost of development and testing. These additional costs include initial testing, bug detection, interphase, design and miscellaneous improvements. The additional costs incurred for iOS development were paid with funds from the “Equipment” budget line.

Note 3: The Android version of the Myko app was not developed in this stage due to the fact that the algorithm design, database construction and metrics research and evaluation segments of the project required additional research, design and testing by the student researchers in the Design & Development, Algorithm Design and Metrics Research teams.

Note 4: The costs associated with this budget line are already included in the Student Involvement-Student Research budget line. Research Assistant Guillaume Beal of the Design & Development team was paid to develop the Social Score Project and getmyko.com websites.

Note 5: This budget line was not included in our initial SPF application. The costs incurred in this budget line were paid with funds from the “Equipment” budget line.

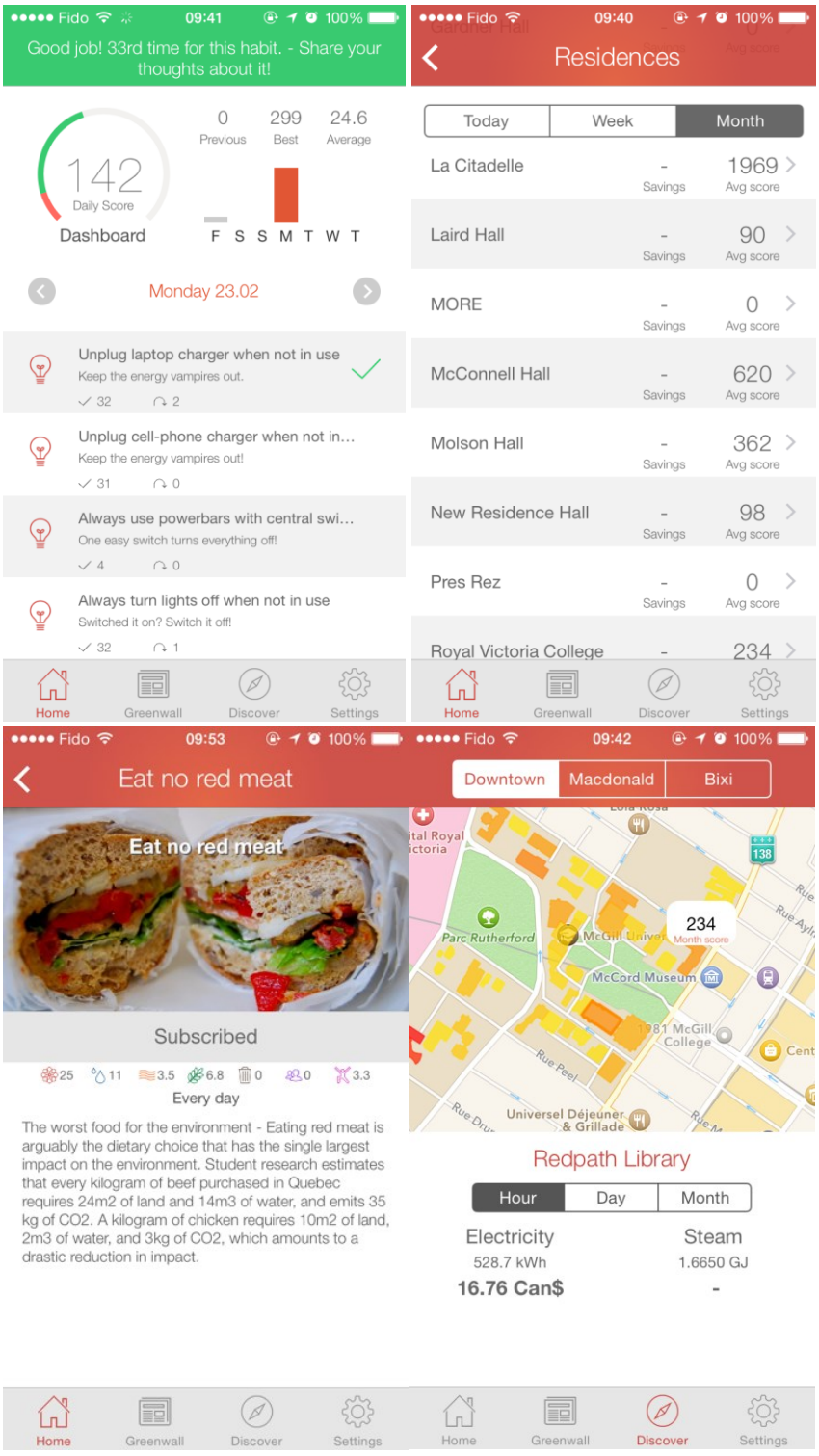
Project Milestones 2014-2016

Category	Milestone	Method	Time
Product Development	Alpha version	Small pool of testers.	June 2014
	iOs version	Available on App Store	Dec 2014
	Android version	Available on Google Play Store	Sep 2015
	Web app	Available online	June 2014
Distribution	McGill	Launch to residences	Feb 2015
		Launch to campus	Sept. 2015
	Other universities	University of New Brunswick	Jan. 2016
		University of Haifa (Israel)	Sept. 2016
User Engagement	Double the proportion of users to 30%	Outreach and marketing through social media	May 2015
		Gamification	Sept. 2015
Research & Development	Passive collection of data using sensors	Point of sale collection cafeteria	Sept. 2015
		Point of sale collection bookstore	Jan 2016
		Deployment of sensors	Sept. 2016
	Reflexive algorithm	Analyze and respond to user behaviour	Sept. 2016

Myko Budget 2015

Description Budget Line	Projected expenses
Marketing Communications, campaigns and social media management. This includes the salaries of the Community manager, Media manager, designers and videographers.	$25,000
Passive Collection of Information Development of point-of-sale (POS) interface module. This module connects the app with Compass Food Services and McGill food and dinning services data collection terminals.	$15,000
Algorithm Strengthen calculation of health and connectivity metrics by deploying a survey and analyzing the data. Improve the accuracy of environmental metrics. Incorporate data from user profiles in order to make the nudge factor reflect the behavior of the user. This includes the salaries of the research assistants.	$25,000
Gamification Design and implement a gamified dimension to the app, including levels, badges, missions, link to user profiles, and a visual representation of a “virtual world” in order to keep users engaged.	$40,000
Android App Development and Web app improvements	$15,000
Development of Myko-McGill app interface module.	$ 5,000
Total Budget required for 2015	**$ 125,000**

Note: These amounts include the salaries of the research director, project manager, project coordinators, external designers, student researchers and external consultants.



See videos at https://www.mcgill.ca/sustainability/mcgill-social-score-project-sp0130 and https://www.youtube.com/watch?v=WfC7rMh3J3U.

Social Score experiment results

Myko began life as an experiment conducted by students in the Law Faculty's Sustainable Development class. The goal was to reduce the footprint of a weekly event, the Law Coffee House. First, a behavioural baseline was fixed by gathering data about the impact of the event: garbage vs. recycling produced, local vs. imported drinks consumed, and types of food choices made. At the second step those poor results were made known through posters and an email campaign. This information nudged possible recycling from 2% to 25% of the possible total, produced a 20% increase in local beer consumption as a proportion of total consumption, but the carbon footprint of food choices (vegetarian, non-vegetarian) remained constant. The third step involved social scoring and real time feedback. 116 participants agreed to have their choices recorded through the evening. These were entered on iPads and combined into a constantly updated Google docs spreadsheet. Impact scores were displayed at stations where choices were being made (drinks and food bought, garbage, recycling and composting disposed). Collective score was displayed on a screen as a needle going up and down from 0, which was fixed at the baseline of the previous week. To add stringency to the experiment, in the middle of the evening free food and drink were introduced. The results were dramatic. Although collective score started to go down significantly as free food was introduced, ultimately those being monitored performed significantly better than the previous week. For that group, local drink consumption jumped to 50% of the total, vegetarian choices now accounted for 2/3 rather than less than 50% of the total, and 60% of recyclable material taken was recycled. Compared with the rest of the population, which was approximately the same size, the monitored group consumed 1/7th of the free wine and 1/6th of the free food. No incentives were offered.