

Facilitating Elders Aging in Place: The 2017 Enterprise Management Hackathon

In 2015, the world population consisted of 47.8 million people who were aged 65 and over. That number is projected to rise to 56.4 million in 2020 and 82.3 million in 2040. As an increasingly higher percentage of the population ages into the “golden years,” it has become more critical to identify ways in which the elderly can pursue a life of health, safety, and fulfillment. For most elderly, being able to age in place – live in their own home as opposed to a retirement facility or nursing home – is a top priority. But how can they—and their loved ones—stay on top of health concerns and daily life tasks, in a cost-effective and reliable manner?

With the growing capability of the internet of things (IoT), increased use of internet-connected sensors, and the ability to consult remotely with doctors and other caregivers through video, there is now the possibility to create a network of first-line care centered around the home, making aging in place a more viable option.

Figuring out how to apply home-based sensing and decentralized data distribution to improve the quality of life for seniors who are aging in place was the challenge of the 2017 Enterprise Management Hackathon. This four-day action learning course brings student teams together with partner companies and industry thought leaders for the purpose of addressing emergent, cutting edge business problems. The Enterprise Management Track provides a holistic, cross-functional approach to problem-solving, and the Hackathon is an important part of the track’s pedagogical vision.

“Hackathons are intrinsically tied to the spirit of MIT. Bringing a group of talented, motivated individuals together to tackle a challenging problem is at the core of the *Mens et Manus* motto,” says Nehal S. Mehta, MBA ’18, one of the participating students. “Given that we all have aging loved ones, this challenge struck particularly close to home as one worth embracing to the fullest possible extent.”

Aging in Place: Understanding Concerns and Exploring Resources

To kick off the Hackathon, representatives from partners SAP, IDEO, TÜV NORD, and the MIT AgeLab provided critical context about the issues facing the elderly and the potential for new technologies to create successful options for aging in place. Guenter Pecht-Seibert, head of the Research and Innovation Team at SAP Innovation Center Network spoke about how SAP develops new growth businesses by pioneering new markets and disruptive technologies. Reed Williams, Design Lead at IDEO, explained the capabilities of IEFO’s open source software Nomad, a universal messaging protocol that’s part of the Internet itself. Carsten Becker, head of Corporate Center Innovation for TÜV NORD, talked about the importance of security in our modern world. “For TÜV NORD, it is important that all students understand the importance of security and safety in a digitalized world. And we wanted to motivate the MIT students to design services and products which focus on customers’ needs,” says Becker.

The MIT AgeLab's Dana Ellis and Samantha Brady provided valuable insights into the challenges of aging in place. They also brought in local residents ages 80+ who are involved with research at the AgeLab to speak about their wants and needs.

"We were excited to share our knowledge about what aging in place means, the factors that facilitate it, and the challenges and opportunities associated with it," says Brady, a resource specialist at AgeLab. "We also wanted to shed light onto the larger landscape of disruptive demographics and our aging population. We hope the information we shared demonstrated that longer life is a great opportunity to invent new ways of living longer better."

While their knowledge was invaluable to the students, the industry experts felt that they—and their organizations—also benefited from their participation in the Hackathon. Says Williams, "We'd been focused on the development of Nomad for a while and had a bunch of ideas for how it might be used, but we really wanted to see completely fresh takes on how it might be applied. I was particularly excited to see how the students applied the technology and to see what kind of business they wanted to build around that use case."

Each student team was then charged with developing the components and features of an application that utilized the capabilities of IDEO's open-source software, Nomad, with the growing capabilities of the IoT, specifically internet-connected sensors. Solutions needed to address the safety and reliability of sensors, as well as privacy protections for data obtained from those sensors. The first, and perhaps most critical step, for the teams was participating in the design thinking workshop provided by SAP, which introduced the students to the ways in which design thinking provides a framework for creative problem solving.

"Both SAP and IDEO are leaders in design thinking, but for this year's Hackathon, their expected roles in the workshop were switched," explains Sharmila Chatterjee, academic head for the Enterprise Management Track. "SAP provided the design thinking workshop, a field in which IDEO is a known pioneer, and IDEO provided the technology pitch."

Diversity of Focus and Solutions

On Thursday, March 23, four student teams presented their ideas to the judges. Each gave an elevator pitch that captured the essence of their solution and showed a brief video that illustrated the challenge problem and promoted their solution in an innovative and engaging way. The teams then gave full, 20-minute presentations that outlined their approach, strategy, and the specific elements of their solution.

The teams' focused on a diverse range of the issues facing the elderly, and offered a wide array of product solutions. The liveHAPPY team wanted to combat the sense of isolation and disconnection that the elderly feel—from the communities they've grown up in, the hobbies they've engaged in, and their family and friends. The team created a software solution that connects the elderly with one another and with a community that could support them. The software would utilize data from existing in-home and wearable sensors and knowledge collected about an individual's hobbies and interests to provide safety, monitoring, and fulfilling engagement with activities and the surrounding community.

“We decided early on that our objective was not just to help the elderly age in place, but rather to help them age well,” explains liveHAPPY’s Nehal Mehta. “Aging well, in our minds, meant enabling the elderly to continue to engage with and contribute to their communities and social circles in meaningful ways. Our name says it all; we designed our solution not to just help the elderly to live, but to help them to liveHAPPY.”

Team Live Alive sought to improve the quality of life for the elderly through increased levels of community engagement. They offered a customized weekly newsletter for the elderly to give them things to do, in and outside the home. Personalization would be based on data from their sensors and suggestions for activities based on a person’s mobility and capability. The Rosie team (so named for the housekeeping robot on *The Jetsons*) focused on removing many of the challenges associated with maintaining a home. Their application featured an automated system platform that used sensors to monitored the cleanliness of the home, the state of the trash, the amount of food in the refrigerator, etc., and offered assistance via automated or third-party helpers.

The Wisdom team wanted to deliver dignity and independence to elderly living at home. Making use of Amazon’s Echo and Alexa automated assistants, they created a voice interaction application that links all the existing devices and smart systems already in place in the home. The system would interact with a bracelet worn by the individual and track movement and health data and be personalized to each individual based on his or her background, interests, and situation.

For many of the students, the process of working as a team and executing design thinking were the most valuable lessons of the Hackathon. “The most important lesson I took away was to be able to quickly put myself in the shoes of our target market,” says Wisdom team member Lissy M Giacomán, MBA ’18. “I really enjoyed our team dynamic, which balanced creativity with practicality. Through design thinking we were able to brainstorm and list every idea that came to mind - no matter how crazy it was.”

The team’s products were as impressive as they were diverse. “Their solutions reflected the complexity of aging in place and the groups went beyond medical and physical components to design solutions addressing social connection, involvement in community, and quality of life,” says Brady. “We were impressed by their interest and commitment to addressing the full scope of aging in place.”

A Winning Glimpse into the Future

A panel of judges comprised of company representatives, industry thought leaders, and MIT Sloan faculty and staff determined the winner based on the ingenuity of the solution, a holistic approach to problem solving, the business model, and the feasibility of the solution.

The LiveHAPPY team took first prize, with Wisdom as the runner-up. “It was very tough for the judges to determine a winning team,” says SAP’s Niraj Singh. “At the end we chose the team

that offered the best package. LiveHAPPY had an excellent pitch, plus a realistic scenario that we thought was very close to what we think is the future. They based their results on valid research and interviews and delivered a solid business model.”

But the rewards of the Hackathon are more far-reaching than a first-prize ribbon. The students cherish the chance to gain industry knowledge and apply practical solutions to real-world problems. They also have the added benefit of knowing that the solutions they landed on in just four days could end up being widely used some day to facilitate a more fulfilling, aging at home experience.

“The Hackathon was a great experience for me,” says Meredith Thurston, MBA ’18, of LiveHAPPY. “Our team hit the ground running, applying the lessons we had learned in the design thinking session to creating a solution to the question of aging in place. I was particularly pleased to have the opportunity to develop a prototype of our product, which is something that I have never done before. Learning how to design for a specific user and depict this design to our audience was a very rewarding experience.”