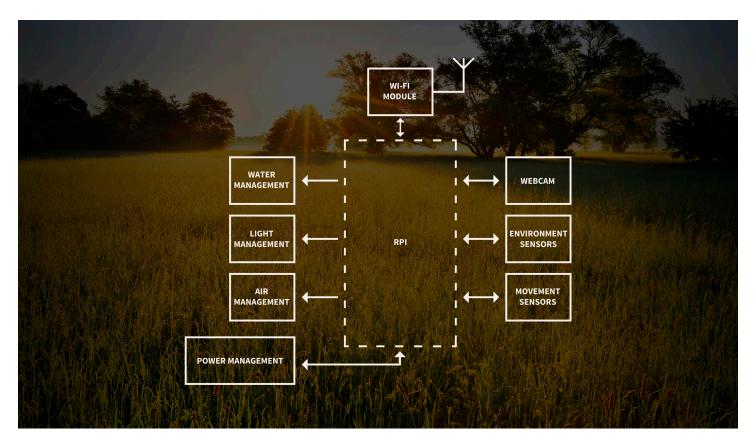**CASE STUDY**

DEVELOPING A SMART GREENHOUSE: EPAM WINS ORACLE PRIZE

From smart homes to smart cars, it seems like everyone wants to be part of the Internet of Things (IoT). And there's good reason. These technologies make our lives easier - and analytics agencies predict the IoT industry will top $7 trillion by 2020.

Along with the IoT comes the need to innovate and develop the back-end solutions that will make our world more connected.

To take on the challenges of IoT, EPAM established its Embedded UI Innovations Team as part of the larger EPAM Innovation Laboratory, where specialists work on a range of open source projects, prototypes and developments in emerging technologies. The Embedded UI Innovations Team comes to work every day looking for new IoT challenges to create new and inventive ways for our clients to approach the market.

The Embedded UI Team has a habit of pushing themselves – just because. They'd been working on the concept of a "smart greenhouse" for a few months in their spare time. They'd come up with this idea because they were interested in harnessing the IoT for environmental purposes while pushing themselves to work in Java programming language instead of the simpler C or Python they had been using.

It's no surprise that when the team heard Oracle was holding an Internet of Things contest, they were determined to put the finish touches on and enter their pet project, the smart Greenhouse.

THE CHALLENGE

CREATE A SMART GREENHOUSE

When it's time for a team of skilled developers to create a greenhouse, there's bound to be a list of requirements. And there were. The team determined the greenhouse should have:

- Light and water controls
- Temperature and humidity monitoring
- Management and remote monitoring
- Automated photographing of plant growth
- Protection in the event of electricity failure or power outage.

THE SOLUTION

To create the greenhouse and ensure it met all of these functionality requirements, the team decided to grow beans. The reason: Beans grow quickly, and that meant that the team could discover and address any project flaws early, and often – saving time and money while developing a better product.

The best ideas can fail if developers don't make smart technology choices. The team chose Raspberry Pi as the base, because this credit-card sized computer runs different operating systems and has outputs for sensors. Compact, versatile and powerful – just what they needed.

They got the technology stack and rolled up their sleeves to code.

Once the code was completed and the greenhouse was assembled, they set up a time-lapse shoot to capture germination. And it all worked.

THE CHALLENGE

MAKE ANY GREENHOUSE SMART, ANYWHERE

Once the small version of the greenhouse was operational, the team was ready to push the technology so it would make a meaningful difference in the real world? Could the smart greenhouse work anywhere for anyone? Could it go beyond nurturing plants to help farmers improve growth monitoring?

THE SOLUTION

The team made a Linux distribution of the greenhouse project. This choice meant anyone could download the software, install the sensors, and make their greenhouse smart. One programmer stepped up and allowed the team to use his garden as a beta test - and it worked.

Now, Oracle award in hand, the EPAM team has developed an IoT product that could change the face of greenhouse technology for farmers around the world. They went from brainstormers to prize winners. But with a success like this, everybody wins.

For more information,
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