IoT 201: Building skills in IoT development

A next-steps developer guide for IoT

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Continue building your skills in developing IoT solutions with this developerWorks next-steps developer guide. IoT 201 is for application developers who are taking the next steps in using Internet of Things technologies to build new and innovative apps.

In the previous learning path, IoT 101: Getting started with IoT development, you got an overview of the concepts and skills that IoT developers need. In this IoT 201 learning path, you'll dig deeper into the skills you need to develop innovative IoT solutions.

In this IoT 201 learning path, you're first introduced to some of the key tools and technologies for large-scale IoT development. Next, you'll explore IoT developer kits and IoT architectures. Then, you discover lessons learned in developing connected cities, an ultimate large-scale IoT project. Finally, this IoT 201 learning path culminates in a video-based tutorial where you get to build your next IoT project — a healthy habits tracker.

1. Discover the next layer of detail in IoT development

With IoT sensors becoming ubiquitous in everyday life, IoT developers need to hone their skills for developing large-scale, complex IoT solutions. As you work to make your devices smarter, you need to work smarter by using the best tools, technologies, and systems. Learn about these tools, technologies, and systems in this article.

> *“ To be a part of this technological revolution, you’ll need to explore the architectures, designs, and development best practices of more complex IoT solutions. ”*

Start your learning here by reading this blog:

- **Diving deeper into IoT development**

2. Speed up your IoT development by using IoT developer kits

To jump start your IoT development, you need to use an IoT developer kit. Many IoT devices are custom-built after prototyping with microcontrollers (like ESP8266s) or single-board computers (like Raspberry Pi). In this article, explore some of the popular developer kits that show the variety of capabilities available in the kits.

> *“ Developer kits bundle a microcontroller or single-board computer and compatible components that you can use to prototype your IoT devices. IoT developer kits often include components such as breadboards, jumper wires, expansion boards, power supplies, batteries, sensors, and actuators. These IoT developer kits, however, are more than just an assortment of hardware components – these kits also provide development resources, sample projects, tools, and services to support developing applications using the hardware. ”*

Learn about developer kits in this blog:

- **5 popular IoT developer kits**

3. Use IoT architectures to create scalable, flexible, and robust IoT solutions

Planning and outlining IoT architectures will help you manage the complexity of IoT solutions. Be sure to succeed by reading this article that considers all the layers in an IoT architecture, designing for automation and interoperability, and the value of standard IoT reference architectures.

> *“ An architecture describes the structure of your IoT solution, including the physical aspects (that is, the things) and the virtual aspects (like services and communication protocols). Adopting a multi-tiered architecture allows you to focus on improving your understanding about how all of the most important aspects of the architecture operate independently before you integrate them within your IoT application. This modular approach helps to manage the complexity of IoT solutions. ”*

Learn about IoT architectures in this article:

- **Simplify IoT development with IoT architectures**

4. Explore a large-scale IoT solution, connected cities.

As you expand your IoT development into real world scenarios, you'll quickly learn about the challenges you face in connecting people, services, and infrastructure. In this article, you'll learn how IoT developers must work with older, existing technology along side of the newer technology.

> *“ Many cities and towns around the world are turning to IoT to solve urban problems, such as traffic congestion, and to improve the safety and quality-of-life of their citizens. Smart sensors that are installed throughout the city, in vehicles and buildings, and apps and devices that are used by people who are living or working in the city produce data that is used throughout these connected cities. The IoT data is used to inform decisions on how public spaces are designed, how to make the best use of resources, and how to deliver public services and utilities more efficiently and effectively. ”*

Learn about the challenges of developing large-scale IoT solutions in this article:

- **Building connected cities with new and existing IoT technologies**

5. Build your skills in IoT development

Now that you've expanded your knowledge of the complexities of IoT development, you're ready to build your skills with this video-based tutorial. Build a healthy habits tracker system, by using an AdaFruit Feather Huzzah IoT developer kit, Python, Java, MQTT, and IBM Watson IoT Platform. You'll learn how to assemble the device, prepare the microcontroller, connect the device to the IoT platform, and run the Java-based cloud application.

Listen to Anna introduce this IoT project:

To view this video, **Healthy Habits Tracker - Introduction** , please access the online version of the article. If this article is in the developerWorks archives, the video is no longer accessible.

Go on, dive in! Use this video-based tutorial to develop an IoT project that uses an IoT developer kit, an IoT platform, and a Java app:

- **Build your IoT skills by developing a Healthy Habits Tracker**

Next steps

Still want more? In the **IoT 301** learning path, we'll tackle IoT security challenges, IoT device management, and IoT analytics. And, we'll be extending the healthy habits tracker app that you built in this learning path. Until then, explore some of the content in the related topics.

Related topics

- IoT articles and tutorials on developerWorks
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