



# Internet of Things

The Cloud is absolutely everywhere these days. And we're not on about the weather. There's a good chance you're using it where you work, or if you're not now, you could be soon.

Thing is, like virtually everything else, you need to stay safe while using it.

If you don't, you could end up losing a lot more than just some data.

This workbook is going to show you how to keep on top of it all.

**NAME**

---



## HOW TO USE THIS WORKBOOK

Read at your own leisure! Take it home, stick in on the coffee table, and flick through the bits that take your fancy. Each part ends with a short summary to drive the learning home.

## WHO IS THIS FOR?

- Anyone who works in a business that is implementing new technologies
- Or even anyone with a keen interest in technology and its growth

We'll look at how these changes will affect both our personal and work lives.

## INTRODUCTION

As long as technology has been around, we have controlled it. It connects us to several sources of information.

But in the vast universe of technology, things are starting to get even more interesting.

So – what is the Internet of Things?

It's all about things connecting to other things.

There's a huge network of devices connected to the internet, exchanging data with each other.

We're not talking about laptops and smartphones. That's old news.

We're talking about our coffee machines waking us up with fresh coffee. Cars parking themselves. Cement telling us when a bridge is weak.

No, really.

Before you know it, your whole house could be filled with devices that communicate amongst themselves.

And imagine how businesses and production lines could evolve.

The workbook is all about how the world around us is changing, with some fascinating examples.

## WHAT'S CHANGING

Objects are beginning to share information with each other. Meaning they'll need us less and less.

For example: your coffee machine is told that it's 6am, so it should start brewing some coffee. Then it sends you a notification, wakes you up, and tells you it's ready.

Hey presto! You get to wake up to the smell of fresh coffee – and you didn't even do anything.

Let's see how some other tech giants have moved with this tide:

- Amazon has introduced a Dash Replenishment Service, which orders supplies on your behalf when you're running out. A button, connected to your devices, like your washing machine, will order detergent for you when it's low.
- Samsung has 'SmartThings,' which aims to turn your home into a smart home, wirelessly connecting a range of things in your house to each other.
- Google purchased 'Nest' in 2014 – a company that makes thermostats and smoke detectors – to stay abreast of the smart home trend.

## TAKEAWAY

It is predicted that by 2020, there will be 50 billion 'things' connected to the internet – that's 8 things for every person on the planet.

That's a lot of things.

## HEALTHCARE

Let's take a look at the amazing ways healthcare and lifestyle are developing with technology.

### Fitness Bands

Fitness bands are a huge market. They allow people to have a watch that also tells them how many calories they've burned, how many steps they've taken that day, how well they've slept, and whether they've reached any personal goals, they've set.

Oh, and some of them tell the time, too.

But there's even more going on there.

In 2000, actor Michael J Fox established The Michael J Fox Foundation, 8 years after he was diagnosed with Parkinson's disease. The foundation's aim was to find a cure for the condition, which affects 7 million people worldwide.

In 2014, The Michael J Fox Foundation teamed up with Intel to announce they had developed a device to track the symptoms of Parkinson's disease patients.

The wearable band tracks various activities and symptoms, including movement, tremors and sleep patterns.

Intel said the use of this technology makes keeping track of symptoms much easier for patients – who otherwise had to manually write down their symptoms.

Pretty revolutionary.

### Smart Pills

In 2017, the Food and Drug Administration (FDA) approved the world's first smart pill.

The smart pills have an ingestible sensor – as small as a grain of sand – which sends a message once it touches your stomach acid, transmitting to a smart patch you can wear on your left rib cage. The patch then sends data to an app on your smart phone.

This is great news for tracking mental illness, as doctors can see if patients are remembering to take medication or not.

Unused medication is a huge cost to healthcare services, and forgetfulness can be a huge factor.

The pill is called Abilify MyCite, and is made up of silicon, copper, and magnesium, and is placed inside a pill called Abilify – which is used to treat mental disorders like schizophrenia, bipolar disorder, and is also used in conjunction with antidepressants to treat depression.

And some other products on the market...

- Scales – makes a note of your weight, sends your results to an app
- Cups – tracks and displays your hydration needs, tells you when you've drunk enough
- Toothbrush – records brushing habits, how long you've brushed for, encourages good techniques
- Pet feeder – calculates what and how much your pet should be eating. Monitors how much they consume

## TAKEAWAY

The Internet of Things marks a very exciting time for the development of medicine.

From fitness bands to smart pills, devices are helping us keep track of our health and fitness!

## SMART BRIDGES

Let's look at how the Internet of Things is affecting infrastructure.

When bridges collapse, it's pretty serious. There are countless cases in history that have caused fatalities and injury, not to mention the destruction and expensive mess it creates for the city.

In 2007, a bridge in Minneapolis collapsed during rush hour, killing 13 people and badly injuring 145 others. Some cars ended up in the water.

Why? The steel plates in the bridge's foundations weren't strong enough to handle the load.

That's pretty frightening stuff.

Naturally, the Minnesota Department of Transportation came under some serious criticism. The incident sparked national fear, and people were arguing that repairs and replacements needed to be carried out on this bit of aging infrastructure.

It left a lot of people feeling unsafe.

More recently, in 2017, a bridge in Atlanta collapsed, forcing 250,000 commuters to find a different route into work or school.

To combat such negative knock-on effects, the cement industry are now using something called smart cement.

Smart cement is laced with sensors that can share information of ice on a bridge, or a weakening of any key material.

You know how your sat-nav might recalculate your route for you if there's an accident or a load of traffic on your way? Pretty helpful, isn't it?

Well, sensors in smart cement will be able to connect with sensors in people's cars – re-routing them through less congested or safer areas.

Cars are now interacting a lot more with their environments. They park themselves; they warn us when we're closer to other cars or when we're nearing the lines of a lane. To put it plainly, cars are becoming self-aware.

Smart bridges will be about to talk to smart cars, and these developments potentially open the door for countless new products and services.

Pretty remarkable.

## THE FACTORY FLOOR

Okay. We've covered smart toothbrushes, coffee machines and smart cement.

How about smart factories?

What's a smart factory? Glad you asked.

It's a revolutionary move in the world of production, which eliminates both unnecessary waste and extra resources. It includes the use of automation and data exchange between technologies. The factory floor and its machinery can all work in sync.

Smart factories are expected to generate a 7X increase in overall productivity by 2022.

The manufacturing world is calling this 'Industry 4.0,' to signify the fourth industrial revolution.

## TAKEAWAY

It's not surprising that the trend of devices communicating amongst themselves wouldn't be wonderful for the world of business – specifically the manufacturing floor.

## BEST PRACTICE

You know how your computer could be hacked into? Well, since they're also connected to the internet, so can your other things.

It's all about adopting safe practices, such as:

- **Avoid phishing emails:** First things first: phishing emails are suspicious emails, designed to trick you into opening and running harmful software on your machine. Don't give out any personal details to a source you don't trust.
- **Firewalls and Antivirus:** Both exist to prevent unauthorised access to your stuff.
- **Update any operating systems or security software:** Sometimes, the vulnerabilities in older software can be exploited, so your best shot at avoiding this is pretty simple... keep it all up to date.
- **Machine certificates:** These are registered by Registration Authorities, and provide a unique ID for your object. The point is that they verify what the object is, and is supposed to be. These are great because they restrict access of the object to only those who hold 'keys' where the certificate is assigned. Speak to your IT person or department.

### QUIZ

Before you go, join us for a little open-book quiz.

Feel free to confer with mates for the answers.

**1.** What is The Internet of Things?

---

---

**2.** What are some examples of technologies communicating amongst themselves?

---

---

**3.** Give some examples of the way The Internet of Things is leading changes in the world of medicine.

---

---