[Isla] Hi I'm Isla, and welcome to coding@home, a regular program right here on 10 Peach and online to show you just how interesting and useful coding can be.

On Wednesdays for primary students and Fridays for secondary students between 11:30 and 12 o'clock, we'll be providing heaps of coding tips that you can use as your entry for the Premier's Coding Challenge.

More about that soon.

Plus, we'll be catching up with some pretty impressive Queenslanders who are using coding to shape our world.

Prepare to discover some super cool applications for coding in the real world.

Coming up today, we're going to learn about cybersecurity, chat with a software engineer...

[Holly] So the main thing I love about my job is I can sit at my desk and I can build one small

innovative piece of technology, and that can go all around the world.

So not just here in Queensland I can have a global impact with one little thing I'm doing in my day-to-day job.

[Isla] ...And look at specific solutions for our target audience.

[Nicole] Each year we work with thousands of students around the country to take your ideas out of the classroom and into the real world.

[Isla] Today, we're looking at cybersecurity, something we all know is pretty important.

We'll show you how to be more cybersecure and how you can spread the message to Queenslanders by creating a chat bot app.

Cybersecurity is a key part of your safety. Using a strong password, keeping your private information private and secure, and thinking before clicking on suspicious links means you're being cybersecure.

If you don't do these things, a cybercriminal may be able to use your information to commit crimes like stealing money, identity theft or spreading computer viruses.

These things can happen without you seeing or even knowing about them.

Cybersecurity is important for all of us when we're online.

If you're in Years 3 to 10 you can help keep Queenslanders cybersecure by entering your app in the 2020 Premier's Coding Challenge.

Winning students will share in a $10,000 prize pool of some great prizes like robotics and electronics kits.

<Electronic music>

Let's get started by exploring cybersecurity and the world of chat bots.

Did you know that the global cost of cybercrime is predicted to hit 6 trillion dollars in 2021?

Cybercriminals use technology online to commit crimes like stealing money, stealing other people's identity, and spreading computer viruses.

Often, this happens without people even noticing.

Cybercrime is a big problem.

90% of cybercrime is caused by human error.

This is when a user clicks on a suspicious link, or opens a dodgy email.

Fortunately, I can think of a solution to this problem. A digital solution.

If we can help people become more cybersecure by improving their online safety, we can prevent them from becoming a target of cybercriminals.

And this is a good thing for all Queenslanders.

<Upbeat music>

We can do this by making an interactive chat bot. A chat bot is short for chat robot.

This is a program a user can talk to by using voice or text. The chat bot is designed to answer the questions.

If you've ever asked Siri, Google, or Alexa a question, then you have used a chat bot.

We won't be designing anything as complex as Siri though.

Our version will be a lot simpler and will only be able to answer the questions that we program it to.

Chat bots can be described as a form of artificial intelligence because it interacts with a human user.

But it can only answer a limited amount of questions, so we define it as narrow artificial intelligence, or Narrow AI for short.

So why would a chat bot be a good digital solution to this problem?

Why not just get humans to tell other people about cybersecurity?

A human helper can only listen and reply to one person at a time.

A chat bot can be used by many people at the same time.

If we can help more people to learn about cybersecurity, we have a better solution.

But keep in mind that chat bots can only provide answers to questions that they are programmed to answer.

So, the more we can learn about cybersecurity, the smarter our chat bot will be.

So in summary, we're not designing a chat bot to be smarter than a human helper, but we are designing a chat bot to help more people than a human helper can.

Who will be using our chat bot? Will it be kids around your age?

Or adults? Or maybe we're designing a chat bot to teach younger kids about cybersecurity.

If you were to design a board game, what features would you include that would be interesting for users that were your age?

How would those features change if the game was for young children?

or children who haven't learned to read yet?

What features we would we need to include if the game was for kids who couldn't see or weren't able to use their hands?

We might include more pictures than words for young children, or a way for the game to convert text to audio, or to play sounds when things happen.

The features that our target audience needs to support their interaction or use of the chat bot are functional features.

Functional features can include voice commands, audio representations of images, audio prompting of options, or even a camera that can track eye movements.

Our chat bot might not have these functions enabled, but it's important to consider how we could make our chat bot accessible for all users.

The visual features of a product will also determine how well it is received by our audience.

These include the type of language, colour, font and styles that are used to display our content.

We need to make sure that the language we use is appropriate for our audience, and we use the right balance of colours.

Younger audiences may prefer more colours than older audiences.

Any font or graphic styling we choose may also affect the way our audience feels about using the chat bot.

We'll also need to consider how our audience will be accessing our chat bot.

Will they be using a mobile device, a laptop, or a PC?

These functional features will determine how we design our digital solution so that it works well on our target audience's devices.

We can design a product for a certain audience by selecting the features that appeal to or are most appropriate for that audience.

So let's recap. To make our chat bot, we need to follow five stages.

Decide on our audience and design a solution that will appeal to what they like.

If we are going to program a cybersecurity chat bot, we will also need to learn more about cybersecurity, so we'll need to do some research to help us become cybersecurity experts.

The third stage is to design our chat bot.

To do this, we'll write an algorithm.

Our fourth stage is to program our chat bot.

This means writing some code.

And finally, we'll need to test our chat bot and evaluate how well we did. We will need to determine if our digital solution solves the problem.

This episode will cover the first two stages.

Later, we have some special guests joining us to share their knowledge.

[Holly] So I got into cybersecurity because I wanted to work in an industry where you could help lots of people all around the world, and I thought going into engineering and learning how to problem solve would really help me do that and have a real impact.

[Isla] And help you learn more about cybersecurity, selecting a target audience and how to design your digital solution.

[Nicole] Using our framework, we'll take the information we've gathered to decide on a refined problem, a target audience for our chat bot, and some features that would appeal to our target user.

[Isla] Welcome back. Earlier, we talked a little about cybersecurity...

Cybercriminals use technology online to commit crimes like stealing money, stealing other people's identity and spreading computer viruses.

Often this happens without people even noticing.

...discussed that different audiences have different wants and needs...

...and discovered more about chat bots and what they're used for.

[Stacey] Hey everyone, Stacey here.

And today, we're going to catch up with another industry professional to help us stay safe online.

Who better to help us navigate all things chat bots and cybersecurity than IBM security software engineer Holly Wright?

She helps companies stay safe online using coding software.

Holly, how did you start your career in cybersecurity?

[Holly] So I got into cybersecurity because I wanted to work in an industry where you could help lots of people all around the world.

And I thought going into engineering and learning how to problem solve would really help me do that and have a real impact.

[Stacey] What do you love about it?

[Holly] So the main thing,

I love about my job is I can sit at my desk, and I can build one small innovative piece of technology, and that can go all around the world.

So not just here in Queensland, I can have a global impact with one little thing I'm doing in my day-to-day job.

So my day...

I might spend my day coding.

I might spend my day talking to people around the world, my colleagues that are around the world, and together we come up with new ways of helping protect businesses and individuals.

[Stacey] you must have many career highlights so far, but can you tell me about a time where you feel you made a real difference to an organisation and individuals as well?

[Holly] Because we work in security we can't talk about specific customers or specific events, but there's been many times where technology that I've built here in Queensland has helped customers all over the world actually save themselves from being attacked in a cyberattack situation.

So what this means is they can detect the attacks quickly.

They can respond to them quickly, and it means that they save millions and millions of dollars, and actually prevent customer data from being leaked online.

[Stacey] That must be very rewarding.

[Holly] Absolutely, it really is.

<Upbeat music>

[Stacey] Now obviously you're doing a lot to help people, but how do chat bots help people?

[Holly] So IBM Security actually has a chat bot of its own and that chat bot helps customers who have

a quick question that they want to ask. It can answer those questions without the customer having to make a phone call so you can kind of think of a chat bot like a little baby.

When it starts out, it doesn't know anything yet, but we teach it by giving it lots and lots of documents to read and it builds up its understanding of a particular topic.

So then when someone comes along they can ask their question and the chat bot can either answer or maybe if it doesn't know the answer to the question it can say, "Can you rephrase that?" or it might say, "Give us a call,

I don't understand yet."

[Stacey] Holly, why is it so important to understand your clients' needs and to know your audience?

[Holly] So it's really important for us to understand customer pain points so we can actually come up with some innovations that helps alleviate those pain points.

So you can imagine trying to serve chocolate to someone who didn't like chocolate.

[Stacey] Hang on, so you're telling me there are people out there that don't like chocolate?

[Holly] Yeah, that's what I'm saying. But it's never going to work, right if somebody doesn't like chocolate and you're giving them all the chocolate in the world.

They're still not going to want chocolate.

So what we have to do is we have to listen to our customers and understand what their problems are so we can actually build things that really help them.

[Stacey] OK I guess you do make a very good point! Tell me more.

[Holly] OK, so knowing your audience can actually make or break your design.

So a good example that we had once, was we were working with a security analyst and they were trying to detect cybersecurity attacks that were happening in real-time.

So they had to read heaps and heaps of data, and it was a lot of information for them to try to absorb all at once.

So what we did was we came up with a solution where we used virtual reality, and we built a star map.

So you can imagine the sky like space and we plotted all of those pieces of data in the sky.

This meant that the analyst they could quickly look up into the sky and they could see the relationships between the data and they could respond to those attacks more quickly.

[Stacey] So you're the expert, can you explain why cybersecurity is so important?

[Holly] So the reason cybersecurity is so important is because so much of our lives are intertwined with technology these days.

So you can imagine you know most people are on social media, on the internet, even when you're just driving along the traffic lights are powered by technology, so it's really important for us to get cybersecurity right from the very beginning.

So it only takes one small time for a silly mistake to result in some of your information being made available online forever.

So a good example of this might be a fingerprint.

Say someone was able to get a copy of your fingerprint, that person would be able to unlock your phone for the rest of your life.

[Stacey] So can you explain how we can protect ourselves in this cyberworld?

[Holly] So there's a lot of things you can do.

The first thing is just being aware of it.

So make sure that you're never reusing the same password in different websites.

You want to make sure that your password's really long.

But you can use something like a password manager, so you don't have to remember all of these different passwords.

You've got one place to go.

So you can also do things like making sure that all of the information that you share online is only ever with people that you actually know and that you trust so you should never put anything personal up there for the public to see.

[Stacey] Let's talk passwords. What makes a strong, secure password?

[Holly] So here are some of the really commonly used passwords, and they're not so good because they're not very long.

They're not very complicated.

You can see some of them, somebody just swiped their finger along the keyboard, so that's really easy for either a person or a really smart computer to guess.

[Stacey] Holly what would your advice be to someone thinking of a career similar to yours in coding?

[Holly] So there's heaps of different ways to follow a career into coding.

One of the things you can do while you're still at school is you can try a coding subject.

So see if you like it.

Give it a go.

You can also practise your problem-solving skills through some of the other subjects that you're doing and those problem-solving skills are going to be helpful in coding, but they'll also be helpful in anything you do later in life.

You can also try extra curriculars, so you can give a coding challenge a go and get involved that way.

[Stacey] Holly I've learnt so much.

Thank you so much for teaching us all how to be cybersecure and now I think I have to go away and think about my passwords and make them a lot more secure.

[Isla] Up next, our guest takes us through planning and implementing an app.

[Nicole] As one of Australia's largest providers of youth entrepreneurship programs, each year we work with thousands of students around the country to take your ideas

out of the classroom and into the real world.

[Isla] And we learn how to define a target audience.

[Nicole] We need to build a persona for our target user.

Personas allow us to empathise with how an imaginary user would use our product.

Constructing a persona will help us to ask the right questions and answer those questions with the audience in mind that we're designing for.

[Isla] In this episode, we're starting the first few steps of our coding project that will help assist Queenslanders with cybersecurity.

We've done our research on cybersecurity.

Now, we need to work out who our project is for and how we design a solution for a specific audience.

Have you ever wondered how things go from being an idea to an actual thing?

Nicole Dyson is the Founding Director of Future Anything and has been transforming young people's passion and curiosity into innovative ideas that make their world a better place.

[Nicole] As one of Australia's largest providers of youth entrepreneurship programs each year we work with thousands of students around the country to take your ideas out of the classroom and into the real world.

Using our framework, we'll take the information we've gathered to decide on a refined problem, a target audience for our chat bot, and some features that would appeal to our target user.

The framework we'll be using uses design thinking to understand users, challenge assumptions, redefine problems and create innovative solutions to prototype and test.

The world has become increasingly interconnected and complex.

Design thinking helps us grapple with this in a more human-centric manner.

And by human-centric we mean that we want to design our products, services and systems to meet the needs of the people who experience the problem.

At Future Anything,

we believe that the best ideas come from entrepreneurs that are able to use their lived experiences and their passions in the design thinking process.

Ultimately if you or somebody close to you has never experienced the problem, it might be very difficult for you to be authentic, original and effective.

Additionally enthusiasm is contagious.

The more passion you have for solving your problem,

the easier it will be to stay motivated.

OK, so let's dig into the first two steps by having a look at the following two questions.

How did you get here? What experiences do you or people close to you have with cybersecurity and safety?

In thinking about cybersecurity and safety, what part of the problem matters to you?

You'll notice in my table, there's one answer that appears in both columns.

I have both the lived experience of online gaming and a passion for making it cybersecure.

Finding a crossover like this is where the magic happens.

Moving into Step 3, we need to consider why the problem matters.

We need to make sure that it's a problem worth solving before we invest time designing a solution.

The best tool to unpack this is a Root Cause Tree.

To do this we put the problem in the middle of the tree.

You'll see from my example that we're digging into cybersecurity threats in online gaming because it links to both my lived experiences and my passions.

We draw the branches in the tree to show what happens as a result of the problem: the consequences.

And for each branch we ask, "And then what happens?"

After we tackle the branches we then move on to the roots to consider the causes of the problem.

To do this we ask why and we keep asking why until we unpack all of the causes, big and small, of our problem.

Then we need to pick a root to focus our solution on.

How do we do this?

Well, it should be interesting.

If you find it boring, don't pick it.

It should be relatable.

If you don't know much about the problem, because you haven't experienced it, don't pick it.

And it should be changeable.

If the cause isn't something that can be changed or improved by a chat bot solution, then don't pick it.

For example, one of my root causes is oversharing personal information in online gaming.

This is interesting to me.

It's relatable to my personal experience, and it's changeable with a chat bot.

I'm going to pick that one.

After we've chosen our root cause, we need to decide on our target audience, or target user for our solution.

This is Step 4 in our process.

Who else thinks it matters? In other words, who is the person that is most likely to benefit from us solving this problem?

To do this, we need to build a persona for our target user.

Personas allow us to empathise with how an imaginary user would use our product. Constructing a persona will help us to ask the right questions and answer those questions with the audience in mind that we're designing for.

For example, what age range are they?

What devices are they likely to be using to access our digital solution?

What other features will appeal to them? Why are they looking for our product?

Now that we've considered our persona, we need to keep them at the centre of our solutions finding process.

Moving on to step 5. What could we do about it?

We need to consider the features that our solution needs to have in order to solve the problem for our persona and excite our persona.

To break this down,

we're going to consider our chat bot solution as a gift we're making for our persona.

To do this, we need to focus on three key elements.

Firstly, what goes inside the gift?

These are the functional features of our chat bot solution.

Some users may need voice commands or audio representations of images.

It's important that we make our chat bot solution accessible for everyone.

Next: how are we wrapping the gift? These are the visual features of the product.

In other words, we need to think about the language we're using, and the colours.

Finally: where is our persona going to find our gift?

Are they using a mobile device, a tablet or a PC?

The functional features that we choose need to align with a device that our persona is using to access our chat bot.

OK, let's recap. The best solutions are developed by entrepreneurs that are able to use their lived experiences and their passions in the design thinking process.

The best solutions get specific about what part of the problem they're tackling.

The best solutions get specific about who they're solving the problem for.

The best solutions get specific about the particular features that would excite the persona.

I can't wait to see all of your fantastic designs.

[Isla] We've seen some pretty cool ways coding is used. Like chat bots.

Remember, when you're designing your project,

think about who it's for.

Then, think about what it's like to be in their shoes.

What features would appeal to them?

Write three features down and make some notes on how they might look included in your digital solution.

And of course, think about taking part in the 2020 Premier's Coding Challenge. It's fun and we'll help you with some tips and inspiration along the way.

Well, that's it for coding@home for today.

We'll see you next Friday with some more great tips and we'll catch up with some more cool people.

Until then stay safe, and make sure you look out for each other.

Catch you next week!

Authorised by the Queensland Government, Brisbane.