# Dr Phoey Teh

The Impact of AI on Business

*April 2025*

**Professor Richard Day**: Good evening everybody. My name's Richard Day.

I'm the Pro-Vice Chancellor for Research, and it's my very great honour to introduce Phoey tonight.

I've just got a few things to say before then.

One is to give you a really warm welcome to the University, particularly those of you who've not been here before.

And also to do the standard emergency announcement that we're not expecting a fire alarm tonight.

But if we for some reason do get the alarms going off, the exits are there, and there. And follow one of the research team, and we'll lead you to safety.

So, a few words about Phoey, Phoey is a reader in social computing.

She's a senior fellow of AdvanceHE, and a senior member of Institute of Electrical and Electronic Engineers.

And, being of an engineering background myself, I know that that's really quite challenging to do. That was quite an achievement.

She began her academic career in Malaysia, progressing from lecturer to head of Department of Information Systems.

Further research and teaching collaborations taking her across Asia and Europe and the rest of the world.

And it's actually in Malaysia where I first met Phoey, rather than here.

Her main research interests are in social computing, particularly understanding the dynamics of human interactions with digital platforms and virtual communities.

Exploring topics such as online social networks, sentiment analysis, and user behaviour in virtual environments.

She's well published in a field with over 85 research articles, book chapters and conference papers.

She has recently launched the Social Computing Hub with her co-founders, with the aim of being a leading centre of excellence in computing research, fostering innovation, collaboration, to address complex societal challenges.

So with that, I'm going to hand over to you, I won't stay on any more thunder by, , telling people what your title is.

**Dr Phoey Teh:** Okay. Thank you. Thank you for the warm welcome. Thank you to everybody to attend this talk.

So as you can see, the title is about the impact of AI in business.

So in next slide I'm going to start and set the scenes of this talk by playing a three-minute video.

So in this video is going to show you about the history of AI and how AI evolved through time.

**Video:** Our story begins in the mid-20th century.

In 1956, a group of visionary scientists gathered at the Dartmouth Conference marking the birth of AI as a formal research field.

In the following decades, AI pioneers focussed on developing algorithms and computational models to mimic human intelligence.

The 1960s saw the rise of artificial neural networks inspired by the way our brains process information.

By the 1980s, attention shifted to knowledge based A.I. systems and expert systems.

These systems utilised logical reasoning and domain specific knowledge to solve complex problems in fields like medicine and planning.

The 1990s and beyond brought tremendous progress in machine learning, with increased computational power and access to vast amounts of data.

AI researchers developed powerful algorithms that could learn patterns and make predictions.

The dawn of the 21st century witnessed a data revolution.

Big data became the fuel that propelled AI forward.

Techniques like deep learning, enabled by neural networks with multiple layers,

revolutionised computer vision, speech recognition, and natural language processing.

AI's impact expanded across industries.

In healthcare, AI algorithms analysed medical images and assisted in diagnoses.

In transportation, self-driving cars emerged, promising safer and more efficient journeys

In commerce and marketing, AI empowered businesses, with personalised recommendations and targeted advertising enhancing customer experiences.

AI became an integral part of virtual assistants, revolutionising how we interact with technology.

Looking ahead, the future of AI software is filled with immense potential.

As technology advances, we can expect AI to possess even greater capabilities.

Imagine AI systems that can understand and respond to complex human emotions, enabling more empathetic interactions.

AI software will continue to advance in fields like natural language processing, allowing for more accurate and nuanced understanding of human speech.

Translation technologies will become even more seamless, breaking down language barriers and fostering global communication.

In addition, AI will play a crucial role in tackling some of society's most pressing challenges.

From climate change to health care, AI software will assist in analysing vast amounts of data and generating insights that can aid in decision making and problem solving.

Furthermore, advancements in AI ethics and explainability will ensure that AI systems are transparent, accountable, and aligned with human values

As AI software becomes more integrated into our lives, responsible development and deployment will be key priorities.

And that concludes our journey through the history of AI. From humble beginnings to today's AI driven world, the progress has been astounding.

As we move forward, let us embrace the potential of AI software to shape a better future for all.

Thank you for joining us on this ride.

**Dr Phoey Teh:** So thank you.

So I think that slide has told everything that I need to tell today.

So has everybody heard about Alan Turing?

Yeah. Yeah. So in 1949, the philosophy of AI was coined in that time. So an Alan Turing test, Alan Turing trying to find out if humans are able to distinguish between communication between human and machine, and try to ask if machines can think. So if humans are unable to distinguish between computers and human. Then we will say that a machine actually are able to exhibit the intelligence.

In 1964, right, the first program, Eliza, was developed in MIT by Joseph Venable. So it is to simulate a philosophy. And this is the first conversations that humans have with machine. Yeah. So that was the first symbolic AI that we think, that we talk about.

And in the 1970, the first software MYCIN was developed. So, this is an expert system that is able to actually diagnose bacterial infection and even recommend antibiotics to help in medical system.

Looking ahead, moving forwards to 1980 and 2010, that was the time the impressions of AI come into mind, where everybody talk about machine learning.

So what is AI actually?

So AI refers to the simulations of the human brain. That programmed into a machine to make that machine to think and learn like a human. They call it human intelligence. That is the meaning of AI. During that time with the machine learning. The first algorithm was developed which is neural network. So neural network is the algorithm to implement a machine to mimic human brain. So it processes the data by collecting all the base data and provides output.

Moving, fast forward to 2010. That is the time that we talk about deep learning. This is the time that we talk about the AI recognition, which is voice recognition in image recognition. Yeah, that is the time with that revolution.

So AI has been well known with the technology that assists our life, right?

So in 2020, we have been using it, especially during the pandemic, where humans have to keep the distance from each other. So what we have done, computer become exploitations. Everybody implementing it. Automation in customer service, automations for supply chain accounting and human resource. Everything we talk about automation, right?

And with text analytics, natural language processing, it has been used to provide us with the translation service, language learning process. Yeah? With the Duolingo.

And also with the current technology. My friend here that I'm going to demonstrate later, which is a part of natural language processing. And we consider that AI. And biometric with the face recognitions, biometric handprint.

So these are all AI.

Cyber defence. Decision making. You’re analysing huge and complex data to provide decisions, analysed with the algorithm, provides prediction.

Marketing automation where you start to shop online during pandemic and Amazon even know and personalise your shopping habit behaviour.

Understand that you are going to purchase it next and suggest to you, oh someone have purchased that, why not? You know?

So all these are AI automations behind. Through the data that you have been feeding the internet cloud right?

Of course continuously we also implement in our manufacturing.

And virtual assistant which is chat GPT, chat bot that you have been using it today from time to time helping you to draft your reports and submissions.

And augmented reality of course with the virtual reality. And if you've read the news lately, Mark Zuckerberg even talks about in five years’ time, 2030, the Google Glass is going to replace our mobile phone.

I don't know, what do you think? I think yes, possible? Right?

So now I'm going to test my friend. I always talk to my friend every day.

So I hopefully you work fine. Alexa, are you here with me?

**Alexa:** I'm not quite sure how to help you with that.

**Dr Phoey Teh:** All right. Alexa, can you add sending proposal to Nicole to my to do list.

**Alexa:** Sending proposal to Nicole added to your to do list.

**Dr Phoey Teh:** Thank you. Alexa, can you read my to do list?

**Alexa:** You have three items on your to do list. Sending proposal to Nicole.

Send email to Nicole and wake up at 8 a.m.

**Dr Phoey Teh:** So that is my to do list. You can see that AI actually helps us in our daily life.

You can listen to music. Listen to news. Alexa, BBC news.

So that's it. You see you so you can listen while you are cooking.

It's working hard. Alexa stop.

So you can even ask Wrexham football score. You know all this. So it has been helping our daily life.

You can even ask Alexa to turn off the light. But I'm not connecting to our smart light here.

And you get Alexa to work on the robots and cleaning the floor.

So, Alexa, has been in my life, of course, it will be very useful in your business, right?

So you can have one. I'm not earning anything. Okay. So it is not very expensive.

Alexa, stop. You cannot control this Alexa.

I just should not alert the, alert her anymore.

 All right. Let's stop playing with my friend.

So now let's go back to how, looking at how research actually change and evolve with what I have done in the past.

So I will say AI actually can be categorised into different stages of development.

So the first would be the rule based AI

Rule based means that you set, you set the rules to the machine to ask them to perform some activity. So that's rule based okay.

And the second stage will be content based.

You need to provide the full sets of data so that the AI or the machine will be able to process and understand what do you need?

Then the next stage will be revolution in AI.

So it is to make sure that that machine really understand you, the human language, which is what we call natural language processing.

Okay. So throughout my research, back in 1998. Yes, I was that old I am that old no, 1998. I did my BSc in remote sensing in Malaysia, University Technology Malaysia.

So what I did is that I start to work with my supervisor, Doctor Dave.

, Kasturi David Connor, she graduated from Japan.

Our study was actually to use, to write algorithm, generate algorithm for the satellite to analyse the data that it picked up from the Earth.

So that is remote sensing. Studying an object from afar is done without physically contacting them.

So it's remote sensing is an area that has been used in many industry players like fishery department,

urban planning, forestry management and many others.

So in my study, I come from Malaysia. That is my dissertation project actually.

So I come from Malaysia and I was born in Penang.

That specific corner here, Tanjung Bungah.

Right. So in this research, I was asked to actually pick up some sampling point and then generate the algorithm so that the satellite Malaysian satellite, first satellite during 1998, the algorithm was developed by myself and my supervisor of course.

So it was implement to then study our image and earth processing.

So that was the time that you really start to use program and setting rules, algorithm coefficients, and get the satellite to process and think like a human.

Tell me when it is this colour. That's what it means when I say that colour, this is what it means.

So this is what we do. Rule based, rule-based AI.

Okay. Continue following that, I did my masters in information technology. That was back in 2002.

We still using C.D. During degree, I was using floppy.

And that time we have CD. Whoa! Amazing.

Everybody is playing with that. So what I did, my project was, I have developed a software that I try to ensure that people can also learn Japanese language without really attending class.

Because I did my Japanese language in degree for three years. Curriculum continuously three level. So it takes so much time.

So there are some people that actually already know how to speak Japanese, so you don't have to teach them from scratch.

So how to actually get them to learn? Start from the level. Okay. So you are comparing me with Duolingo. Please don't. It was 23 years ago. Okay. When I was doing that.

So I developed that software. So put it in the CD to assist Japanese teacher to teach Japanese language. And they can even do a test and then go to the level that they should continue.

Similar to Duolingo that you download if you have been using Duolingo.

But I'm not that advanced at that time and I don't have robot with me.

I don't have smartphone, don't have grant as well.

Okay. Well, that was what I say. Content based AI feeding the information, writing program, getting the machine to think like a human and teach you and guide you with your level.

So that was my Masters. And then in 2007, I started my PhD.

So at that time the computer, the world wide web was overall everywhere. Everybody talking about that, the blogosphere, people writing blogs and journals education and all this.

So what I figured out is that that's a problem, that there is too much information overloading.

Right? We have search engine. Right? But the true blogosphere, it is so difficult for you to search some function.

So I figure out there is some mechanism that core RSS really simple syndication, but they will actually develop and written in different formats.

So my PhD was actually to figure out how do I coalesce the information and then feeding to, in the latest and chronological order.

I won a gold medal with the innovation in 2011 with my, supervisor who passed away a few years ago.

Right. So I very thankful to him. Push me forward.

Yes. Do it. Try it. And all this. So very happy with that.

Very proud with my supervisor. I still miss him a lot anyway.

So that research. Really? You actually, you are using it every day, daily.

If you have Facebook account, Instagram, TikTok.

Yeah. What you are doing is that when you click on the hole on the front page, what you get is the chronological order of your network posting.

Yeah. So that is what it does in a simple format.

Simple way. It's called a mechanism for information retrieval.

It is very important because it is part of AI. You have to gather information and then summarise them using algorithm and then provide you the output.

Like ChatGPT like everything.

And they would need to take the chronological order, the latest information, latest new in a very super speedy version.

Right next. So after my PhD this is around 2009 and I published that paper in 2014.

Yeah it took a few years. Yeah. So what happened was that I faced some challenge.

So that time my two daughters, they were eight years old and six years old.

Now they are nineteen and seventeen, yay I’m free.

So at that time I was so busy; mother, head of department, school lecturing, fetching them to school.

All right. So household mess. It is a mess.

So I need to hire helper. Lucky enough in Asian country, it's quite easy for us to get help.

Helper at home. Okay, so I got a Cambodian helper staying at home version.

So I was facing difficulty to explain the way I want you to iron my coat please. Anyway, so.

So I was thinking how nice if I have something that is emotionless, you know, something that can repeat and talk to my helper to guide her when I'm not around and even can perform language translation.

Wow. All right. Good. Right. Four years project. My god.

Right. So I published that. And thank you to my uncle if you are watching my recording, he's in Malaysia. He actually drew all the picture for me for free because I told him about that project. And I need picture, I need video recording. I record the process, you know, feeding all the content into the app.

And it was used that time personally to, to help this.

So of course today you have robot. I have not enough money to buy that anyway. So you have robot to do all this lot. They already feed information they taught that robot by feeding all the video, teaching them movement and everything in the robot.

Similar like 2014 ten years ago. I have the idea no funding.

So after that I have been working on the area surrounding using machine learning to understand, review and contain or comment to suggest for businesses, trip Advisor and Airbnb, by looking and reviewing comments posted by client.

And also this one was to talk about in the 2015 before you are using the selfie stick, I was at a conference talking about the behaviour of taking selfie photos, in that research, and I was interviewed by wired magazine and it’s now still online, American Wired magazine interviewed me to talk about the selfie stick, the hand span and all this. It's still online here.

And also, I have been working with my students because I'm teaching now. So I've been working on a lot of research with a different batch of student collaborators working on sustainability, public opinions, retrieving tweets, understanding London Bridge attack and cyberbully detection, pollution, all different kinds of project with students and most of that that I'm talking about, are in that publication list of 85 that you were talking about.

So you can take a look in the future if you're interested and you find anything that you want to talk about with me, send me an email.

Let's continue. So come back to AI again.

So machine learning is actually a branch of AI. I will say that. That focus on the development of algorithm and statistic model. That actually enables computer to learn and think and make predictions and provide decisions for us based on the historical data.

With all this complex data, follow up with that is to present them. So in a way to present that, perfectly. We would actually use different kinds of ways to provide output that come the stage of data visualisation and data analysis.

So why I say that this is relevant to AI because you’re using machine learning to understand the review. Natural language processing. And then you have to provide the outcome to display it.

This is a geospatial analysis. It is an analysis to show geographical view of the world. Happy, happiest country in the world using visualisation tool. So the dark blue areas means that they are very happy country, Sweden, and dark greens are very unhappy countries.

You can even provide a lot of outputs in the business view by aggregating data using data visualisation, and present them. I believe most of you have been using many different kinds of software in your businesses to do this presentation.

In recent years, when I joined Wrexham University, I also collaborated with some of our colleagues. Some of them are here sitting here.

I had just presented yesterday in a conference about a topic that we talk about, really cool sentiment analysis of Billboard hits over the last three decades.

And Dmitrii, I think you are here. We work on the AI influence, non-player character dialogue and gameplay experience, and also some other projects with collaborators in Wrexham University. These are all the titles that I’ve published in past two years with Wrexham University collaborators.

So they are all about reasoning AI, which is, we talk about how human like reasoning works with natural language processing and large language model. Also trying to understand how ChatGPT works behind the scenes.

In the future, of course, we can do a lot with AI. Algorithm on large language model like chat bot robots are learning and all these. I'm going to demonstrate something later on how to develop a very simple chat bot that you can even do it at home later if you want to.

And also, AI impact on virtual reality AI intelligent use in medical health care. I don't know if Paul, Paul is here? Paul Saul. No, he's not here today. So he's a GP, in Wrexham. We were actually talking about some project together on AI in medical healthcare recently and also topic about AI hallucination,

Which is very important. I need to, I need you all to take a look on this issue. This topic has come to a very huge attention, right? What's happening is that AI hallucination means that AI could even provide you a wrong message. Misleading. And it's very dangerous if you use AI fully and trust it one hundred percent. You are in trouble.

So these are some of the examples. Okay. So even small wall fragments and doctor recommend 2 or 3 cigarettes for a day. Why? Because AI actually grabbed the information from any public data without filtering it. So you need someone from computing actually to help you validate the AI machine that you develop.

Yeah. And also, see, I'm feeling depressed. So one of the Reddit suggest jumping over the Golden Gate Bridge. You're watching movie, right? You know, the friends, that movie. People are talking about that and that AI is not smart enough, right? So we need to ensure that we manage and monitor it.

Another question. Very simple. Country in Africa that starts with K.

So it says that none of them begin with K. But in fact we have a Kenya. Yeah, that start with K. So there are many more. You can take a look online. The screenshots over there. So people have been sharing it. So this issue, you have to take note if you are planning to use AI to help and assist you. We need some kind of monitoring management and filtering process.

Okay, so looking at the bright side, because I was a bit negative, right? Bright side is that you can earn a lot of money. This is one of the examples where generative adversarial networks were developed, this, these art pieces were sold at the auction for £432,000. Wow. Rich, right. So it is actually trained with the dataset of 15,000 portraits from the 14th to 19th century. And you'd use the discriminator to produce the image indistinguishable from the original. Can you believe that you can make money by producing art pieces?

And you can also use AI to produce music. Produce poetry. Produce a lot of composing song. And if you can see, most of the pictures that I use in my slides were produced with AI art pieces.

AI has been so useful in many industries, of course healthcare, to perform diagnoses, detect disease,

personalised treatment plans and the use in robot surgery, which my cousin actually is an oncology researcher and also doctor, consultant. And he was using sometimes a robot in the surgery. We were talking about how impressive, the technology is today. And the predictive analysis for many businesses to predict what's come next.

And also have been used in many other industries such as for policymaking, understanding public sentiment, for informed decisions and also improving public services, the use of AI in optimising and allocation of public services.

Okay, so what happened in Asian part, where I come from, AI in East Asia. I'm now here, of course. So I'm talking about what happened, what advancements had come before I came over here around 2022. So I was in Sunway Medical Centre. They already start using the robot catering machine to deliver food to the patient room. And they can even provide a traffic and distractions that can, they can reroute and replan. They are delivering to ensure that the food is still warm to the place. So how good is that?

And also we have this drone delivery system now is used in Taiwan. Okay. So it can even deliver a 9.8kg of product, for 13km in 16 minutes. So how fast? How good is that now? Nowadays.

And next one. Palm payment. I think most of you heard about WeChat palm payment ability to intelligent. You can even without phone. You can pay with your hand. So if you forget the phone, the only thing is don't get robbed with your hands.

The next is the traffic monitoring system using AI. Tesla, Asia, China. They have been using it as well. These are all the advancements in the East Asia right.

So which apps today are using large language model reasoning AI, human like communication. First thing Duolingo, you use it to do your language learning and also be and you use AI chatbot every day. Yeah. And you when you go online, somebody pops up hello and talk to you and you, some of you might just think that it is very human. Some of you will identify it as a chat bot, a machine.

These are all that have been used today that using natural language processing, which is an AI, part of the AI.

According to IEEE research, it says that what is the most important technology in 2025?

So they say that 58% are actually in AI, including predictive generative AI, machine learning, natural language processing, 26% for cloud computing, 24% for robotics. And the 48% in cybersecurity and tech preventions, so we can see that crime attack, cyberbully all are in this category.

And then education activity, customised learning which we talked about learning Japanese,

learning Welsh, which I am and Duolingo actually put them on notification for my Welsh language today. And tutoring services and university chatbot. So it's so useful for today.

So now next thing I'm going to walk through with you is a very simple chat bot development. So this is going into a demonstration. So this is a chat bot flow chart. And you can actually just use it for free in type bot without integrating AI. Because when you integrate AI you need to pay some money.

This is the first stage. You can build it. So this is what I built. So we can play the bots and have a demonstration. So very simple I create it so that assuming my social computing hub is a kind of business. I will introduce myself. What my products are. And then say, can I help you? And I'm ready. And you say yes. And you can then ask questions and get them to submit information, like, what type of industry do you work for? What kind of service do you need?

So these all these you don't need a person to sit there. The chat bot will help you to do that for you even explaining the service. And then get the information so that later you can come back to them. When you wake up tomorrow morning. Yeah. So how good is that to help you? So I believe that most of you have been using it in a way, but actually you can also develop your own for your business. If you need any further help, we have a lot of masters students over here. Yeah. Over in the class that are willing to work with you as a project, pilot project for your dissertation, or maybe for the advanced practices. So that will be good kind of, collaboration that we can work together, right?

That would be it. Okay. So that will be the summary of today. So what have we talk about today? So we talked about AI is not new. It had been coined in 1960. And we talk about the current technology. I spoke to you about the evolutions of AI. And what I have done in my research, the data analysis, sentiment, big data and the purpose of AI now used in business to make predictions. And you also have been using your own, a lot of software that you have.

And the most important thing is that when you use AI, ensure that you know what you get because it is just a pile of information that the AI uses and gathers from the public forum, or articles to answer your question.

Okay. So thank you very much. Do you have any questions?

**Professor Richard Day:** Thank you Phoey. That was entertaining and informative from somebody who normally turns co-pilot off. I’ve learned quite a lot. Thank you.