Engineers Ireland
2014 Presidential Address

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President of Engineers Ireland
CEO, Fujitsu Ireland

THE GLOBE

Konban Wa. Yokoso. Good evening and welcome.

In our company, Fujitsu, we sometimes use Japanese proverbs, not unlike ones found in the Irish language.

> *I no naka no kawazu, taikai o shirazu* 井の中の蛙、大海を知らず, *a frog in a pond cannot see the great ocean.*

Much like the proverb, as Engineers we see beyond the boundaries to what is possible. As Technologists, we are constantly pushing the boundaries, to create new possibilities. The opportunities for our profession in this new world are immense.

Past Presidents, Vice-Presidents, Director-General, Council members, Guests, fellow engineers and my family: Jim, my husband and two of my three children Maeve & Eoghan. You are all very welcome. What an honour to be here this evening to give my Presidential address.

Walking up the steps of Clyde Road this evening, I thought back to my first job as an Electronics technician in Cork and felt a mixture of pride and disbelief. As Paul O'Connell would say. **Unreal**.

I have chosen two main themes of this presidential year: **convergence** between all forms of engineering, and the challenge of **attracting women** to our profession.

I want Engineers Ireland to thrive and push the boundaries of our new **interconnected world** and it is my ambition to make this happen.

I would like to start by first giving you an insight into my world – the company I work with– Fujitsu and the ICT sector where I have spent my career.

TOKYO EARTHQUAKE

It's hard to believe that this picture of Tokyo dates back in the 1920s what with the tram lines, telecommunications infrastructure – almost a modern day image of engineering at its best.

However, in 1923, the great **Kanto earthquake**, measuring 7.9 on the Richter scale struck!

It destroyed much of Tokyo's and Yokohama's public infrastructure – transport, water; telecommunications were wiped out in the quake or the ensuing fire storms. 120,000 people were killed. In response, a small group of engineers went to Germany to learn about the new automatic switching equipment which could help rebuild Japan. Collaborating with their German colleagues, they founded a company, a joint venture between Furukawa Electric and Siemens of Germany called Fuji Electric.

And from these humble beginnings Fujitsu has grown into the global organisation where I work today with approximately 162,000 Fujitsu people supporting customers in more than 100 countries. Fujitsu has a vision of a **Human Centric Intelligent Society** with engineering at its core.

Fujitsu's heritage as an engineering company which is focussed on solving some of today's most challenging problems continues right through to the present day. In an interesting parallel, during the crisis at the Fukushima nuclear plant, caused by an earthquake and subsequent tsunami, engineers were called on yet again. The Fujitsu President made all of our engineers available around the clock to repair data centres, to get telecommunication back online, to use engineering skills wherever possible.

Engineering solves the most difficult human problems, of this there is no doubt. Tokyo, with now almost 30 million people, was largely unaffected by the 9.0 earthquake. Engineers in less than 100 years built a city capable of withstanding a much bigger quake. But nature in the form of a 100ft tsunami still caused havoc.

Another challenge to be solved by engineers.

But that's for another day.

CONVERGENCE OF TECHNOLOGY AND ENGINEERING

As your President I am excited and confident about the future year ahead but also realise the challenges that we face. As you know we are undertaking a strategic review. The challenge for us, as a member based organisation, is to remain both relevant and in tune with our current and potential members.

My Presidency will be one of convergence – **convergence of technology and all forms of engineering**.

It will be a Presidency that celebrates all of our possibilities and diversity. One that continues to push boundaries and be of assistance and encouragement to those in schools and colleges who might consider engineering, and to companies who must encourage job creation in our sector.

It is true that there is a huge convergence happening, between all the forms of engineering and technology. Not only is there convergence of technology itself but also of all our engineering disciplines.

You cannot design and build the Samuel Beckett Bridge without *technology*, and you cannot design a smartphone application without *engineering*.

This is also creating an opportunity for Engineers Ireland in the 21st century to expand our reach, increase our membership and provide a structured framework in which convergence is managed and controlled across multiple engineering disciplines, working in teams to solve multifaceted problems.

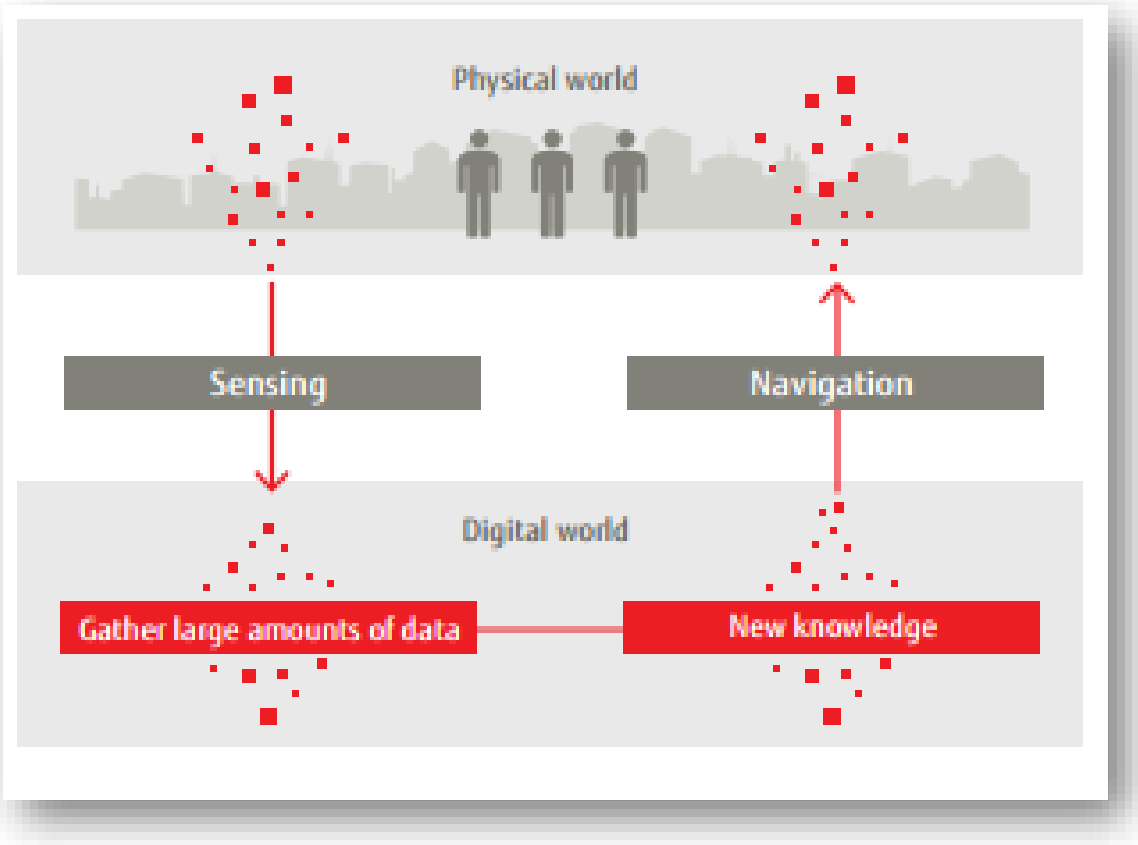
FACTS IN ICT

It's worth looking at some facts about the ICT sector in Ireland.

- We directly employ over **105,000 people**
- **75% employed in multinational companies**
- Remainder in the indigenous digital technology sector

In the last three years over **17,500 jobs** have been announced by technology companies. The sector is responsible for **40% of our national exports** and is home to **8 of the top ten global technology companies**. Ireland is emerging as a global technology hub.

This shows the size of the opportunity for Engineers Ireland's membership and is one which is largely untapped. It is not beyond the bounds of possibility to **double our membership** if the value proposition is right.



COLLISION

There is a **collision happening between the physical world and the digital world**, which is creating opportunities for all of us in the engineering and technology sectors.

As we see in the slide, we all live in the physical world which increasingly we are sensing using IT, even wearable IT. This is generating large amounts of data, which then creates knowledge about our physical environment. This allows us to better navigate and make changes to improve our physical world.

In the past two decades the combination of **computing**, **connectivity** and the **internet** has grown the world's digital economy from zero to tens of trillions of euro.

A new generation of the internet is emerging. People and the things around us, are all linked together, sharing information.

HYPER-CONNECTED WORLD

The World Economic Forum calls it the '**Hyper-connected World'** and it has huge impacts for the future. More connectivity means more collaboration. It means vanishing boundaries. It means changes to the way businesses work and how society creates value. It also means risk and uncertainty. It means the future will be different from the past. There is enormous change happening.

The hyper-connected world was made possible when the internet was born and all manner of things became accessible to almost everyone anywhere.

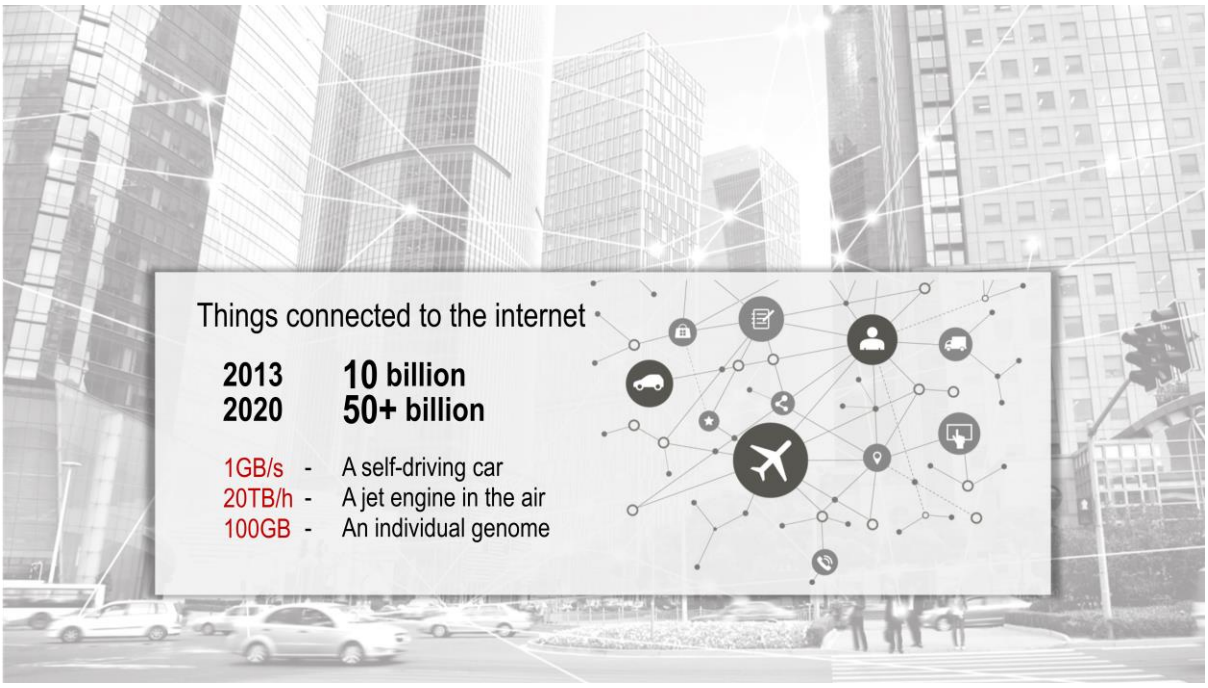
The internet has brought together everybody and everything – people, companies, government and most recently machines.

The hyper-connected world is the foundation of modern communication, trade, human, scientific and economic development. It is ubiquitous. It is everywhere. And it encompasses almost everything and everybody within its borders…

The economic, political, social and business consequences of this new landless continent are real and of a far greater magnitude than anyone could have imagined…and we are only at the beginning of its exploration. It is the playground for all our businesses and organisations and how many of us now live.

At the heart of the hyper-connected world is a **new industrial revolution**.

We in Engineers Ireland need to be very aware of the implications. This revolution is happening now as we connect **all things to the internet** and **all things to each other.** We don't live in the world of screen and computers. We live in the physical world. We sleep in beds, eat food, drive cars, work in buildings, socialise in cities. This physical world is being transformed.



The Internet of Things (IOT)

You may have heard of the **Internet of Things (IoT)**. The digital world will connect your car, washing machine, air conditioner, even your light bulbs. As of 2013, around **10 billion devices** are online and connected to the internet. This number will likely reach 50 billion or more in 2020.

As the number of end points increases, so does the amount of information. Harnessing information gives us new insight and greater control of our world.

It creates knowledge. It also carries risk. With so much of what we do in the physical world now written down in bits in the digital world, we face a serious challenge to secure what we do and protect our privacy.

We must defend ourselves from ever-increasing malicious threats. We must avoid the chaos that change always has the potential to bring.

A huge challenge where engineers can make the critical interventions.

SOLVE SOCIAL CHALLENGES

Population Growth

Urbanisation

Ageing

All of these technology trends will have an impact on Engineering and how we come together to solve some of the world's greatest challenges.

Engineering matters and Engineers Ireland is the voice of engineering on this island. Across the globe, there are Irish engineers, our diaspora.

We have the almost unique position of representing nearly 18,000 engineers from multiple disciplines, all over this island and beyond, of being able to harness the power of convergence of engineering, underpinned by technology.

Living in the hyper-connected world means we are vulnerable to the same risks and share the same challenges. The world's population just passed the **7** billion mark and continues to grow and change. We are ageing and we are moving into cities, creating new challenges for our social infrastructure.

We are facing the threat of **climate change** as evidenced by the conference this week in New York. We must provide **food for the growing global population** and improve food yields. We, as in Japan, must respond to **natural disasters**.

So how do we respond to the challenge of the hyper-connected world? How do we take advantage of the opportunity? How do we guard against its many risks? These changes have huge implications for enterprises and bring new challenges for resource management, healthcare, disaster mitigation and our environment.

Put simply, **we need more engineers in our world**!

There is both a global and local challenge to attract and retain talent into our profession.

WOMEN

Women largely remain a great **untapped resource** in our profession.

We must find ways of attracting young girls as well as young boys to join forces with us and tackle some of the world's greatest issues.

As part of my term, I will champion the schools, colleges and companies who are encouraging women to join the engineering world at any level.

ALICE PERRY

It all started with **Alice Perry**, the first woman engineering graduate in Ireland and Britain in 1906. She paved the way for other women to study engineering. We need more women engineers and we need more women in this organisation, at every level. Earlier this year, Silicon Republic (the online technology media company) set out to compile a list of the leading women in the areas of science, technology, engineering and maths in Ireland.

From world leading academics to inspiring science communicators, from tech business leaders to early entrepreneurs and engineers – they were spoilt for choice and ended up with a leading 100 list.

And the good news is the number is growing.

In last year's Engineering Perspectives Report we were told that on average, the ratio of men to women in engineering was 9:1 whereas a fifth of all respondents in this survey were women. And of these, half were under the age of 35.

We see this as a very positive signal that more women are now choosing a career in engineering as they recognise the variety of opportunities available to them in critical areas such as technology, energy and life-sciences.

It is heartening to see that programmes like our STEPS schools outreach programme are producing results. Our STEPS campaigns, touching the lives and ambitions of more than 56,000 young people last year is a testament to the dedication of Engineers Ireland volunteers across the island.

Other professions like law and medicine do not have the skills to tackle some of our greatest global challenges like climate change, population growth or indeed specific challenges mentioned by past presidents, Michael Phillips and the Challenge of Urbanisation and John O'Dea and the Challenge of Medical Engineering.

TECHNOLOGY AN DTHE WORLD

We should celebrate and be proud that our engineering companies in Ireland are meeting needs across the world, from software systems in place at 10 Downing St to the customer information centre on the Paris Metro, to medical devices that enable blood free surgery in cardiac centres around the world.

We have ground breaking initiatives happening right now in Ireland.

Our engineers are making a real difference.

And we must continue to maximise the convergence of technology and engineering.

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Elon Musk, Founder PayPal & Tesla Motors

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So says Elon Musk – Founder of PayPal & Tesla Motors.

And I completely agree with him.

It is a great honour to hold the office of President of Engineers Ireland and I accept and appreciate the great responsibilities and prestige of this office.

By my calculations I am the **178th President** and **3rd Woman** in this position. I must acknowledge the immense contribution of those of you who have previously served as President and particularly the two great women who preceded me, Jane Grimson and Anne Butler.

Your contributions have inspired me and many other women.

Thank you to all Engineers Ireland members and staff who make such a difference. Thousands of volunteer hours at regions and divisions, at Steps outreach, at events, on interview panels, at council and executive, supported by dedicated staff here in the house. This is a wonderful organisation, lead with passion by John Power. Thanks to all of you for your warmth and friendship.

You have helped enormously in the task of increasing membership and putting Engineers Ireland firmly on the map as relevant and important, for the times we live and work within.

I will continue to do my absolute best to support this work.

I am proud to be an engineer, a technologist and a female running a global company in Ireland but I am immensely proud to serve as your President.

Arigato Gosaimasu

Thank you.