



Queen's University
Belfast

KTP

40 YEARS AND COUNTING

A KTP is a three-way partnership between a business, an academic institution such as a university or college, and a recently qualified graduate known as an Associate, delivering a project lasting about 2 years.

The objective of a KTP is to facilitate the transfer of knowledge and the spread of technical and business skills through innovative projects.

A close-up, high-contrast photograph of several interlocking metal gears. The gears are made of a polished, reflective material, likely steel, and their teeth mesh together. The lighting creates bright highlights on the surfaces of the teeth and deep shadows in the gaps between them, emphasizing the mechanical nature of the image.

KNOWLEDGE TRANSFER PARTNERSHIPS

Queen's University Belfast

KTP: 40 YEARS AND COUNTING...

KTP is the game where everybody wins.

Businesses win because they gain new knowledge and new technology to develop new products and processes; Queen's wins through the expansion of its research and economic impact – and graduates, the KTP Associates, are winners because they get a unique opportunity to launch a successful career.

KTP didn't really get off the ground at Queen's until the 1980s, which makes it all the more remarkable that so much has been achieved in such a relatively short time. The initiative was known in those days as the Teaching Company Scheme. A project with Short's was the first toe in the water, followed by two more partnerships – with Harland & Wolff and British Telecom.

The success of that experience led Queen's to turn its attention to the multiple potential benefits that could be gained from working with another area of industry – SMEs. With funding from the former local development agency, IRTU, the Teaching Company Centre was set up at Queen's in 1993. I came on board in 1994 and I've been privileged to lead the work since then.

In those early years, KTP and other business collaborations weren't high on the list of academic priorities for Queen's. Now they are recognised as a valuable part of the University's purpose, reflecting the changes in how we derive our income and the impact agenda being driven by our funders

in the Research Councils, while the KTP office itself is in an ideal site at the heart of the Research & Enterprise Directorate.

At the beginning, it wasn't always easy to convince businesses of what they had to gain from working with Queen's. Northern Ireland companies fight hard for success, they punch increasingly above their weight but their links with academia were limited. We weren't seen as natural partners in their campaign for growth in the cut and thrust of the competitive business world.

Times have changed. Since 1993 we have had 350 successful KTPs, leading to careers for 400 graduates, generating many millions in profits for the Northern Ireland economy, creating 700 jobs and investment in plant and machinery of £67m. All of this has resulted in 1000 research projects for Queen's, the publication of hundreds of research papers and articles, the engagement of 700 academics and the development of long-term collaboration with industry.

"KTP at Queen's has become the standard-bearer for the whole of the UK. We consistently top the UK league table for both quantity and quality, even though the pool of businesses in Northern Ireland is a relatively small one. There have been 18 national awards in Northern Ireland, for our academics and our KTP Associates."

If there is one word which sums up why KTP at Queen's has been so successful it is – understanding. We understand the local economy, we understand the development needs of local business, we understand the capabilities of our university and we understand how to bring it all together.

You'll find examples of that in the pages of this publication. You'll read about colleagues in different companies in conversation about KTP projects and the impact they have made.

KTP may be 40, but there is much more to come. We've built a momentum which we will work hard to carry forward. We are helped in this by the support of Invest NI which has become an important catalyst, both in helping to identify new KTP projects and in providing additional funding.

We're enhancing the reputation of Queen's and Northern Ireland beyond these shores. Our strategy for identifying new opportunities and turning them into active partnerships has been shared and adopted on a national scale and is becoming a model for others further afield. Recently, I was delighted to visit South Africa as a guest of the British Council to talk about KTPs and their impact.

And there was a very important recognition of our work when I received an MBE in the 2015 New Year's Honours. That was a proud moment for me personally, but it is also an award which acknowledges the drive and commitment of the whole of the KTP team and their outstanding work for the advancement of Queen's and Northern Ireland.

So here's to the next 40 years...



"If there is one word which sums up why KTP at Queen's has been so successful it is – understanding. We understand the local economy, we understand the development needs of local business."

Dr Mary Flynn,
Head of KTP and Business Networks

AUTOLINE INSURANCE: LEADING A DATA REVOLUTION

6



Duy Bui, KTP Associate

Q: Your company shares something with KTP – they're both celebrating their 40th anniversary. Things have changed a lot in your business in that time, as we can see from this KTP project.

JULIE: We started trading personal lines insurance here in Newry 40 years ago but since then we've grown into a broker of commercial and all manner of personal insurance, as well as offering financial services through our Ashtree division. In general, the insurance industry is probably one of the slowest to adapt to technological changes. Telematics, which is the whole area of usage-based insurance, is one of the biggest recent developments. We've been the first in Europe to launch a smartphone app, using telematics technology to measure driver behaviour and we've been the first to link that to a live policy in order to transact business.

MICHAEL: This kind of analysis wouldn't have been dreamt of when the business started 40 years ago. When you consider how things have moved on in that space of time, it's all dramatically different.

JULIE: We launched the app in 2012 and it has really increased our profile over the past three years, right across the UK. We really wanted to capitalise on that and trade more business, specifically in the niche market of telematics. I'd always been aware of KTP but nothing had really rung a bell with us until we began to work on our enhanced platform. Through measuring driver behaviour we were collecting a lot of data about policyholders but we had no expertise in this area because we're a sales-led

Project: Using data analysis technology to give motor insurance underwriters a clearer driver risk profile.

Managing Director: Michael Blaney | Operations Director: Julie Gibbons | KTP Associate: Duy Bui
School of Electronics, Electrical Engineering and Computer Science

organisation. So to use the data effectively, to ensure that it's secure and used correctly we thought – maybe there's room for a KTP associate and we could make this a very interesting project that would be beneficial not only to our business but to the insurance industry as a whole.

Q: *And that's when you came on board, Duy. What's your background?*

DUY: I have an undergraduate degree in computer science and a Masters in business analytics from UCD. So I've got a background in working with data and that's what I want to pursue in my career. I found this job on the internet and I went for it and got it. So far it's been a wonderful experience and I'm learning more and more all the time about data analytic techniques.

JULIE: We've really benefitted from having Duy on the team because he has such a comfort level with data and the scope of what we can achieve has increased as he's been learning about the business. In order to do that, he had to start going through all the data and then put it all together like a jigsaw. Over the past 10 months he's been helping every single department with their reporting needs, figuring out smarter ways they can pull KPI's from the system, which they wouldn't ordinarily be able to get.

DUY: It's been a big learning curve for me. I've been learning on the job but I've also had a lot of support from my academic supervisor at Queen's, Professor Jun Hong. I can see a career path emerging from this. Telematics, which I'm implementing here, is a new and emerging

technology and I can see a role as a data analyst in the insurance industry in the future.

MICHAEL: Yes, there are very few people in the telematics market who would know how to run a driver profiler because it's so new and there will undoubtedly be a demand for people with that skillset, who can answer the question – how do we manage all this data and ultimately translate it into pricing decisions? It needs someone like Duy, with that specialist knowledge, in the middle of the process to make it actually happen.

“That's been the great benefit of this KTP, engaging with a specialist whom we might have found difficult to source in the market ourselves.”

CIRDAN IMAGING LTD: IMAGES THAT WILL SPEED UP DIAGNOSIS

8



Agnieszka Czerwiec, KTP Associate

Q: Hugh, as a founder of Andor Technology, a spin-out from Queen's, you already knew the advantages of working with the University, didn't you?

HUGH: I was doing my PhD at Queen's when we started that company, focusing on developing leading-edge camera technology for research. We're very proud of its success and the support we had from QUBIS Ltd. The company's been subsequently acquired by Oxford Instruments but I'd been at the helm for 19 years and I was looking for new challenges. A key interest was imaging for medical purposes so I had a bit of an apprenticeship in the US for a couple of years and then I came back and set up this company in 2010. A lot of pathology is about imaging but historically they don't take pictures. They look at the tissue and describe what they see. Now imaging is becoming much more important so we developed the company to help capture those images as a first stage and then see in the future if we can provide more analysis to enhance and accelerate the speed of diagnosis.

Q: And what led you down the KTP route?

HUGH: I had experience of KTP with Andor Technology.

For a small company, it's often difficult to do all the leading-edge research you'd like to, especially when you're focusing on other day-to-day activities and growing sales, but KTP allows you, very cost-effectively, to

Project: To accelerate processes in cancer diagnosis, using advanced imaging systems to differentiate between normal and abnormal cells.

Chief Executive: Hugh Cormican | KTP Associate: Agnieszka Czerwiec
School of Biological Sciences

link in with university research and work on the longer-term goals of the company.

“The concept of universities and companies collaborating is such a good idea.”

Q: *Agnieszka, what attracted you to the project?*

AGNIESZKA: I have a Masters in biology from Poland and a PhD in biomedical science from Queen's. My PhD was on Raman spectroscopy and imaging systems and the KTP is about designing a new imaging system, using Raman spectroscopy, so that was the perfect match. It was as if someone had written the project for me.

HUGH: Agnieszka had exactly the experience and ability we're looking for. It was a very good fit. She's a very hard worker, very innovative, she has a lot of ideas, she doesn't need prompting and that's all great for a small company.

AGNIESZKA: And there's a lot of support from my academic supervisor, Dr John Nelson, from the School of Biological Sciences, who has important knowledge and experience. He makes a really important contribution.

HUGH: John was very helpful from the start. When we were having initial discussions with various people at Queen's, he had a lot of ideas about how we could use imaging to help the diagnosis of normal tissue and we rapidly set up the KTP after that.

AGNIESZKA: The problem we're trying to solve is very challenging and we have to look at it from different angles at the same time. I've been given a unique opportunity to work on something of enormous interest to me. Working with John and Hugh is an honour – John for his research and Hugh because he is such a successful businessman. I have deep respect for both of them.

HUGH: We can compare normal tissue and abnormal tissue very effectively but now we need to build on that to be able to take some hard measurements. After that we'll be in a strong position to look at how the technology and the science can be developed into a medical device, which is what we're hoping for. We always planned this to be a very strategic development. A medical device can take quite a while to bring to the market. We knew this would be long-term, a five-year path, so we looked to see what we could do within the shorter timescale of the KTP to make sure we're on the right track. That will help us bring in more support, such as European funding, to help take it to the next stages.

KESTREL FOODS LTD: A NEW VENTURE TAKES WING

10



David Jones, KTP Associate

Q: What's the history of the company and how did this project come about?

MICHAEL: We started in 1991 as a contract packing company. That eventually gave us the confidence to look at starting our own business manufacturing products and importing goods from abroad. In 1996 we registered Kestrel Foods and created the Forest Feast brand, importing products from all continents, mixing them and packing them and selling to supermarkets and food service chains, airlines and so on – very much a snack business with healthy, natural fruit and nut products. But as time went on we were asked more and more for processed products like salted peanuts, roasted salted cashews, honey roast and glazed products so it made sense for us to have a hard look at that and see if there was viability in putting together our own roasting plant.

"We wanted to increase the diversity and innovation of our products but we needed skills that we didn't have and when KTP was mentioned to me I knew it would fit with what we wanted to do."

DAVID: I saw this opportunity advertised and it was just right for me. Food KTPs are quite rare but my background has always been food, through the family firm, Welsh Lady Preserves, which makes jams and chutneys. My grandfather started showing me how the business worked when I was four and later my father relied on me to bring on new products every year.

Project: To embed new expertise that will help this successful snack food packaging and production company branch out into processing.

Managing Director: Michael Hall | Technical Manager: Karen Smyth | KTP Associate: David Jones
School of Biological Sciences

I went to the University of South Wales and got a biology degree which had a strong element of food science and technology but I already had knowledge about flavours and so on so I'm bringing my life experience as well as my academic experience to this role.

Q: What has David's arrival meant?

KAREN: David works closely with me and since he arrived at the end of 2014 he has opened up our thinking about what we're capable of. We've moved from packing and mixing to processing and manufacturing. There's a lot more technical experience involved and it's changed the whole atmosphere.

MICHAEL: We'd invested in a roasting machine but it was the other aspects, flavouring and coating and so on – the whole science – that we needed to know about. We learned things we hadn't expected to. For example, when you're packing raw product and putting it into bags, the wastage is 1%. But when you start to roast, the wastage can be as high as 9% through moisture loss. That has to be factored into the costings.

Q: There is joint academic supervision – Dr Brian Green at Queen's Institute for Global Food Security and Fiona Ferguson at the College of Agriculture, Food and Rural Enterprise (CAFRE). How does that work?

DAVID: It provides me with very rounded support - advice from CAFRE on product development queries, for example, while Queen's gives

me access to the latest developments in research. That's tremendously important for me.

Q: Has it been a steep learning curve?

KAREN: Yes, for everybody and we're still learning and there'll be a lot more when we start putting new systems in place – a lot of new processes and staff retraining.

MICHAEL: It's opened our eyes to other things. We can use the equipment for other purposes, like brining and roasting and salting pistachios, which we haven't done before. The next part of David's journey will be to work with us to perfect that. And there are other possibilities – like chocolate and yoghurt-coated products further down the line.

DAVID: I don't have any experience of that at the moment but I'm delighted that Michael thinks I'm capable of doing it! As for the future, I really want to be involved in research and development. It's really exciting to see new products go from a prototype to being on the shelves and I'd love to be a part of that.

MICHAEL: We've all benefitted. This is an excellent way for any SME to look at the viability of something instead of leaping into spending money without having tested the water.

OSTICK AND WILLIAMS LTD: MARKET LEADER IN BIM DESIGN



12

Mark Tracey, KTP Associate

Q: When did you recognise the need for new skills in the company?

KEN: Three years ago the Cabinet Office declared that by 2016 all publicly-procured projects would have to be delivered by BIM to Level 2. We wanted to be at the forefront of that change. We were still in recession then but we would be coming out of it at some point and we felt it was the right time to invest time and effort and focus on this.

Q: How did you decide to go down the KTP route?

KEN: We'd been in discussion with Queen's academics at the School of Planning, Architecture and Civil Engineering about joint research projects. As those conversations went on...

"...we realised that KTP was a great way to form the relationships between the practice and academia that we were looking for but we could also use the skills within the University in terms of new ways of working."

MARK: I'd just completed my Masters at Queen's and then worked for a year teaching BIM-related software. That placed me ideally when this position came up. I was also very keen to get back into architecture. That's where my passion was and is. I also found that the skillset I'd started to develop was exactly what Osticks were looking for. When I came here I

Project: To deliver innovation and strategic growth through the development of Building Information Modelling Systems (BIM).

Director: Ken Geary | KTP Associate: Mark Tracey
School of Planning, Architecture and Civil Engineering

enjoyed the fact that I could make an impact by combining what I'd been learning about the technology with the experience that Osticks has.

Q: Ken, what did Mark bring to the table?

KEN: Mark and KTP brought a focus and allowed us to transform how we're working in a way that we wouldn't have been able to do by ourselves. We're all busy doing our day jobs in an increasingly competitive market. By bringing Mark alongside, we've seamlessly been able to transform the way we practise architecture through training, new processes, new ways of marketing what we do. Mark made an immediate impact which has meant we've always been ahead of our projected outcomes.

Q: Who were the supervisors on the project?

MARK: Graham Booth, the Head of IT, was the Industrial Supervisor and Dr. John Spillane was the Academic Supervisor from Queen's. He's unique because he's spent a lot of his career in industry as a project manager so he brought a strong emphasis on practicalities, not just theory.

KEN: That's an important point. He got it – what we were trying to achieve. He was able to bridge the divide between academia and practice and that was a key element which made the whole process easy and enjoyable for us.

Q: And what have you gained?

KEN: We were shortlisted in the Royal Institute of Chartered Surveyors BIM Awards this year. We were in the last four in the UK and our competitors were all much bigger. We've transformed the way we work, getting us to a place where we're seen as leaders in the discipline and that makes it easier to talk to clients about what we can offer by way of an innovative approach. It helps us win new work. Again, coming out of recession, we've shaped the practice and given it energy and direction and that's been really good for the staff.

MARK: One of the biggest things for me as a recent graduate is that I'm not just a number. I wanted to be in a position where I was contributing and being relied upon and KTP has brought me there quicker than going through the process of looking for a job, earning your stripes and working your way up. I'm now BIM Manager.

KEN: Queen's KTP Office is very well organised and was a great help in so many ways, giving us a structure in how to go forward. We're now involved in another KTP and that's the result of the encouragement, the incentive and the confidence which this project gave us. We've also established a range of contacts at Queen's and that's very important for the future.

SMITHS ENGINEERING LTD: OPENING A DOOR TO INNOVATION

14



Barry Lynam, KTP Associate

Q: The company's been in existence for 53 years and must have experienced a lot of changes in that time. What's the main focus now?

DARWIN: We began as a family firm, run with a family ethos, and that's still what we are. When my father started the company, it was primarily involved with the automotive industry but through the years we've grown into other sectors and we now have five divisions. Precision machining, precision fabrications – that's the big one for us right now. We're involved in the rail sector, in aerospace and the oil and gas industry. And there is the custodial sector, with the manufacture of security doors, and that's what Barry's directly involved in. We're building the brand, re-emphasising what we can do as a precision manufacturer, developing our reputation and making sure we have a good team. When I started in 2002 we had eight people. Now we have 38. There's now an international dimension as well. We won our first European tender in 2010 - to supply rolling stock, safety-critical components to the rail sector. That tells people what sort of a company we are, with great engineers and great people on board.

Q: SECURE, catering for the custodial sector, is your newest division. How did this KTP project come about?

DARWIN: We're heavily involved with Invest NI. They provide a lot of support and through that we've developed collaborative networks, including finding ways in which we can utilise resources at Queen's. As a result we now have a long-standing relationship with the University. We had discussions with people there, including Colm Higgins, whom I've

Project: Develop, design, testing and manufacturing skills to help the company lead.

Managing Director: Darwin Smith | Production Manager: Greg Crawford | KTP Associate: Barry Lynam
NI Technology Centre and the School of Mechanical and Aerospace Engineering

known for several years and is now the academic partner on this project, to figure out how we could improve our knowledge base in this sector. But when we started down the KTP road, it was slow progress. It was difficult to find someone with the right attributes at the interview stage but we kept going and luckily we found Barry.

Q: What's your background, Barry?

BARRY: I started in Queen's in 2009 studying mechanical engineering, then a Masters. I graduated in 2014 and started looking for jobs and one of the first opportunities I found was this KTP. I'd learned more about KTPs during my final year so I'd been investigating possibilities. Now I'm here and it has exceeded my expectations.

GREG: The KTP has allowed us to put a lot more focus on how we do things. That's been one of the main benefits. We're really focusing on manufacturing methods. Barry's working on ways to do things better and we've been able to dedicate him to doing that.

BARRY: Yes, one of the big things is seeing first hand how industry works. I had the theoretical knowledge from my degree but to apply that, to extend my understanding in practical terms – I've been doing that from day one.

GREG: The key elements for us are precision and cost and also quality. There are competitors out there and the thing that helps us stand apart is the quality of our product. We're trying to keep it that way.

DARWIN: I took the long view for this programme. It wasn't just to have someone for a short time – it was to have someone who would come on board and stay. What Barry has brought to the table is another way of looking at things. He's even put together an electronic sales order system which is making things more efficient and that was never on the agenda. He's also developing his leadership skills, how to interact with the team. You don't get that in a lecture theatre. So we're learning together. It's a great relationship.

"KTP is highly recommended. I look forward to completing the current programme and reaping the benefits. I would certainly consider further KTP opportunities."

MUNSTER SIMMS ENGINEERING LTD: TURNING UP THE HEAT ON PRODUCT DEVELOPMENT

16



Peter Hanson, KTP Associate

Q: Richard, you're a good example of the opportunities KTP can provide, having been a KTP Associate yourself.

RICHARD: I joined Munster Simms – Whale – in 2001 through what was then the Teaching Company Scheme but it changed its name to KTP during my two-year project. That project was very much about bringing analytical process and programmes into mechanical design and I stayed on when it was completed. As for this most recent project, as a company, Munster Simms has been involved in mechanical engineering for many years but we had outsourced all our electronic design – software and hardware. We were reliant on a number of outside companies and we didn't own particular IP, so this was about setting up a department that would be key to keeping our product going forward.

Q: And you didn't need any convincing about the merits of KTP to help you do that?

RICHARD: Not at all.

It's a great way to get a toe in the water and see exactly how to get to where you want to go. It's also great at getting high calibre graduates and there was no shortage of candidates but we're very happy we got Peter.

"KTP is a great avenue through which to bring something new to the company. "

Project: To set up an in-house electronics and software capability with future benefits for product development.

Engineering Director: Richard Bovill | KTP Associate: Peter Hanson
School of Electronics, Electrical Engineering and Computer Science

Q: And what was so special about you, Peter?

PETER: Well, my education was well suited to the position. I have a mechanical engineering degree from Queen's but I also went to Bristol to do a Masters in computer science so I guess I was a unique applicant because I had the two degrees. At Munster Simms, a lot of the products are mechanical but I had the right background knowledge to develop the software systems for them. I was very lucky to be supported by Richard, who's been a great industrial supervisor, and Dr Kang Li at Queen's, who's been a very good academic supervisor. It's been constantly useful to have his insight and support. We went to Queen's for meetings and he came here and through time I was able to borrow Queen's equipment, which saved the company money. It's been an extremely supportive relationship.

Q: And the big success has been the new control board for a gas heater which has been developed in-house?

RICHARD: Over the last number of years we've had a lot of focus on our gas products, various kinds of heaters, but we didn't own the IP for the software and the hardware so it was critical to do something about that. As a result, through the KTP, we've had our biggest product launch for the last ten years.

Q: So how would you rate the success of the KTP?

RICHARD: Out of ten? Ten.

Q: And what's been the benefit for you, Peter?

PETER: Well, I've been privileged to have been given the position of Electronics and Software Manager. KTP gives you a unique opportunity to have close interaction with people high up in the company. You get noticed that way and I valued being able to present to Richard and other directors. It's been fast-paced since day one but that's stimulating and exciting and it's wonderful seeing products that you've put so much effort into going out to customers.

RICHARD: One of the big things about KTP is that it develops future managers. It certainly helped me that way and now it's helping Peter. The establishment of Peter's department is a massive change. We're moving in different times. A number of the projects which have come out of Peter's involvement – we couldn't have originated them eight years ago. It means we can bring products forward quicker, we can add more functionality and be in control of our own development.

KNOWLEDGE TRANSFER PARTNERSHIPS:

World-class expertise, ready for business

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Lorraine Marks, KTP Manager



