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Innovation through Knowledge Transfer 2010

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InnovationKT Preface

I am pleased to extend a warm welcome to the proceedings of the Second International Conference on Innovation through Knowledge Transfer, Innovation KT'2010, organised jointly by KES International and the Institute of Knowledge Transfer, and sponsored by the University of Wolverhampton.

Featuring world-class invited speakers and contributions from a range of backgrounds and countries, the InnovationKT'2010 Conference provided an excellent opportunity to disseminate, share and discuss the impact of university-business interaction through knowledge transfer in all its forms.

This was the second conference in the InnovationKT series, following on from the inaugural event at Kingston in 2009. There were two main motivations in initiating the Innovation through Knowledge Transfer conference series. The first was to provide a chance for publication on a subject where few opportunities exist already. While there would be advantages to learning of the experiences gained through knowledge transfer projects, the stories to be told often do not fit the profile of papers accepted for conferences and journals, which are focussed more on research. The successes of knowledge transfer therefore often go unreported and this conference provided an opportunity to remedy that deficiency

The second motivation was to foster the development of a community from the diverse range of individuals practicing knowledge transfer. I believe that the delegates of the conference are drawn from an interesting community of practice. Those who are able to offer papers and presentations on the joint and related subjects of innovation and knowledge transfer are not all from an academic background. Certainly academics can provide welcome and insightful contributions, but there is expertise, knowledge, skills, and experience of significant importance, to be drawn from the considerable number of knowledge transfer professionals. These people can relate lessons learned, best practice, what works and what does not, from experience gained through setting up and running real knowledge transfer projects. InnovationKT'2010 has succeeded in bringing together contributions from both the academic and practitioner sections of the knowledge transfer community.

The conference called for both short papers and full papers. Full papers of 10 pages in length, written in a conventional academic style, were presented orally at the conference, and appear in these conference proceedings published by Springer-Verlag as book chapters in the KES Smart Innovation, Systems and Technology series. In addition a summary of each full paper was published in the conference digest. Short papers of one or two pages in length were presented orally at the conference and published in the conference digest, but not in the conference proceedings. The programme contained seven invited keynote talks, 40 oral presentations grouped into eight sessions, and one interactive workshop. The

proceedings contain 29 chapters drawn from this material. There were 91 registered delegates drawn from 10 countries of the world, showing that there was truly international participation.

Thanks are due to the many people who worked towards making the conference a success. I would particularly like to thank the Honorary Conference Chair, Professor Ian Oakes from the University of Wolverhampton, for enthusiastically embracing the event and sponsoring it. I would extend my appreciation to the Honorary Conference Series Chairs, Sir Brian Fender of the IKT and Dr Iain Gray of the TSB, for their support. I would also like to thank the invited keynote speakers, the members of the International Programme Committee, and all others who contributed to the organisation of the event.

I hope you find the InnovationKT'2010 proceedings an interesting and useful volume. I hope and intend that future conferences in the InnovationKT series will continue to serve the knowledge transfer community and act as a focus for its development.

Robert J. Howlett
Executive Chair, KES International
InnovationKT'2010 General Chair

Organisation

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Professor Ian Oakes
Pro-Vice Chancellor Research and Enterprise
University of Wolverhampton, UK

Honorary Conference Series Co-chairs

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KES International

Innovation through Knowledge Transfer is organised and managed by **KES International** in partnership with **the Institute of Knowledge Transfer**.

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Keynote Invited Speakers

Sir Brian Fender CMG MInstKT
Chairman and President of the Institute of Knowledge Transfer

Welcome and Opening Remarks

Professor Ian Oakes
Pro Vice-Chancellor Research and Enterprise
University of Wolverhampton, UK

The Role of University – Business Collaboration in Influencing Regional Innovation

Abstract. The capability to produce and use knowledge through strong systems of innovation is now regarded by many as critical to the success of countries, regions, firms and individuals. In the UK, Higher Education Institutions are widely seen as key contributors to regional economic development and a fundamental part of the knowledge economy.

This presentation will investigate the relationship between knowledge, innovation and competitiveness in a regional context and explore the contributions made by universities in supporting regional innovation systems including an examination of the most common models of university-business partnership in use. It will review the role played by the UK Government in encouraging universities to respond to the needs of business and the wider community through 'third stream' funding programmes and examines the appropriateness of the metrics used to evaluate the effectiveness of this type of activity.

Finally the presentation draws some conclusions on the effectiveness of 'third stream' activities undertaken by UK universities and attempts to demonstrate how research intensive and non-research intensive universities can undertake differential yet complementary roles in supporting regional economic development through 'third stream' activities in the future.

Biography. Professor Oakes is responsible for promoting the University's research agenda and developing the growing knowledge transfer arena at regional, national and international levels.

He was educated at the Universities of Aston and Bath and has held a number of senior management posts in higher education. He has been involved in an extensive programme of technology transfer activities, both national and transnational, operating across a range of sectors and has led the development of a number of initiatives focusing specifically on the transfer of technology from academia to both large and small firms.

He has published widely in the field of innovation and technology transfer in the small firm manufacturing sector.

Dr. Nathalie Gartiser & Dr. Jean Renaud
Institut National des Sciences Appliquees (INSA)
Strasbourg, France

Knowledge Transfer in France – From Academic Research to Companies: Organization and Research Examples

Abstract. The French system of academic research is based on an important transfer system from universities to companies. Based on different organizations and helped by different transfer tools, one important political aim is to develop the fertilization of the industrial world by academic knowledge.

The valorization system is mainly based on two dimensions. The first one is based in universities and academic schools with the aims to help laboratories to identify appropriate knowledge and relevant partners to realize transfers from the academic world to the industrial word. The second dimension is based on public organizations, focused mainly on SMEs. It aims to increase dialogue between partners and to accompany the partners in connecting them, to identify the expertise and to help the partners in the first steps of negotiation and eventually contractualization.

After presenting the general mechanism of knowledge transfer between the academic research and the industry in France, and giving some examples of organizations and tools, we will give some examples of study and research partnerships with the aim to illustrate this way of doing.

Biographies

Nathalie Gartiser is Assistant professor in business sciences at INSA Strasbourg - Graduate School of Science and Technology (France). Dr. Gartiser has been working on organization and industrial innovation management for 10 years. As master degree in innovative design, she has also developed research on problem solving in non technical fields during the last years. Her recent research on this topic has been developed on the Field of Environment and Land Use Planning. Involved in entrepreneurship activities on INSA Enterprises department, she is familiar with valorization activities and knowledge transfer between INSA Strasbourg and industrial partners.

Jean Renaud is a Professor of Innovation and Conception at INSA Strasbourg - Graduate School of Science and Technology (France). He holds a PHD degree in Industrial Engineering. His research focuses on knowledge management and multi-criteria analysis. Dr. Renaud currently serves as an innovation expert in French firms and heads a French national association on project management.

Dr. Iain Gray CEng
Chief Executive
Technology Strategy Board
Swindon, UK

Connect and Catalyse to Stimulate Innovation

Abstract. In the dictionary definition, a catalyst is something that acts as the stimulus in bringing about or hastening a result; it is something which modifies and increases the rate of a reaction.

Since it was created just three years ago, the Technology Strategy Board has established a key position within the UK as a true catalyst for innovation and knowledge exchange; it has demonstrated that funding alone is not sufficient to facilitate true engagement between different communities, whether business, academia or government, to achieve measurable, sustainable outcomes but that, by recognising the barriers to collaboration and devising the appropriate mechanisms for overcoming them, challenges can be met with truly innovative solutions and remarkable results can be achieved.

By drawing upon examples from the Technology Strategy Board's portfolio, Iain Gray will illustrate some of the mechanisms which have been successfully employed to stimulate and enhance collaboration between businesses and academia across the UK, to stimulate and support innovation, bring about strategic commercial developments and to address some of the major societal challenges of our time.

Biography. Iain Gray joined the Technology Strategy Board as Chief Executive in 2007, following its establishment as an executive non-departmental public body.

Prior to joining the Technology Strategy Board, Iain was Managing Director and General Manager of Airbus UK, whose Bristol operation he joined when it was still part of British Aerospace.

Iain Gray completed his early education in Aberdeen, culminating in an Engineering Science honours degree at Aberdeen University. In addition, he gained a Masters of Philosophy at Southampton University in 1989 and has received Honorary Doctorates from Bath, Bristol and Aberdeen Universities in 2005, 2006 and 2007 respectively.

Iain is a Chartered Engineer, a Fellow of the Royal Academy of Engineers, a Fellow of the Royal Aeronautical Society and in 2007 was awarded the Royal Aeronautical Society Gold Medal. He is Chairman of the Business and Industry Panel of The Engineering and Technology Board (ETB), a Governor of the University of the West of England, a Board Member of SEMTA and a Board Member of Energy Technologies Institute.

As Chief Executive of the Technology Strategy Board, Iain is the operational head of the new organisation as it assumes its leading role in driving the UK's technology and innovation strategy.

Iain is married to Rhona and has four children.

Dr. Jarmila Davies CEng
Programmes Development Manager
Department for the Economy and Transport
Welsh Assembly Government, Cardiff, UK

Breaking Barriers and Building Collaborations: Knowledge Transfer Development in Wales

Abstract. Knowledge transfer and innovation is high on the list of priorities for the Welsh Assembly Government (WAG). Creation of a dedicated support for KT dates back to 1997, when following the consultation paper 'An economic strategy for Wales', it become clear that an impartial facility for brokering KT opportunities should be established. The presentation will describe a chronological development of processes that grew from a small group of enthusiastic KT practitioners to a multimillion programme delivering versatile support for knowledge transfer activities in Wales.

Know-How Wales (KHW) launched in 1999 was a free all Wales business support service bringing businesses in Wales closer together with Institutions of Further and Higher education and acted as a gateway to knowledge transfer provision between the two.

A first of the EU funding in 2001 enabled the launch of the Knowledge Exploitation Fund (KEF) that dealt with supporting 3rd mission and capacity building for KT delivery within academia. The KEF funding laid the foundations to a 'KTP Mentoring project for the FE sector' aiming to encourage the spirit of collaboration between HEIs and FEIs.

The second tranche of the EU funding secured in 2007 enabled KT community in Wales to continue and strengthen collaborative activities and embed the spirit of CPD, innovation and enterprise.

Biography. Dr. Jarmila Davies is a Programme Development Manager at the Department for the Economy and Transport of the Welsh Assembly Government.

Having graduated in Civil and Structural Engineering at Prague University Jarmila carried out research for the degrees of MSc at Cardiff University and PhD at the University of Glamorgan. She then pursued a successful career in higher education at the university where she led research programmes of international standing. Being a Chartered Civil and Structural Engineer, she gained considerable experience of collaboration projects working with the construction, manufacturing and engineering industries including a broad range of SMEs in Wales.

Jarmila has played prominent roles in the development of lifelong learning programmes for Welsh engineers and the promotion of the public understanding of science and engineering.

She is committed to establishing new forms of interface between businesses and academia and developing relationship and knowledge management as vital tools in the knowledge transfer process. She is a Fellow of the Institution of Civil Engineers, a Member of the European Federation of Engineering Associations, Honorary Fellow of the Chamber of Czech Engineers and a Member of the Institute of Knowledge Transfer and serves on several Boards concerned with education and promoting the public understanding of science and engineering.

Mr. Michael Smith
Senior Innovation Manager
MidTECH - NHS Innovations West Midlands

The Innovation Management and Knowledge Transfer Process across NHS Trusts

Abstract. Knowledge Transfer across NHS Trusts is slowly gathering momentum. The NHS are increasingly becoming aware of the importance of their IP and their relationships with academic institutions in IP creation.

MidTECH have been working with these Trusts trying to establish a culture where the protection of ideas is a high priority. This has come up against some resistance within the healthcare system but in roads have been made. MidTECH have adopted a system whereby projects are turned over very quickly and a priority is given to "quick-wins". This is showing Trusts that achieving a return from their IP is possible and case studies are feeding more ideas. This rapid turnaround has required an internal change in IP project management. Target-driven, internal competition, bonus schemes and a "hands-off" approach to the technology have all contributed to our model.

This presentation will look at that system and also look generally at how the NHS structure is changing and how that impacts on innovation.

Biography. Mike Smith has worked for various NHS Trusts and Universities in the West Midlands region for over five years, developing and commercialising new ideas and products. Previously, he has worked in the private sector licensing software technologies across the U.S. and Europe. Currently, he is the Senior Innovation Manager at MidTECH - NHS Innovations West Midlands and works directly with NHS staff to assist them in protecting and developing their novel ideas and innovation.

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Session A
Value Creation through Knowledge Processing – Methodologies, Approaches and Case Studies

Can Knowledge Be Transferred?

Richard Ennals, Peter Totterdill, and Robert Parrington

Kingston Business School, Kingston University, Kingston KT2 7LB, UK

Abstract. The paper argues that conventional models of knowledge transfer are confused and mistaken. Books can be transferred between people. Knowledge is more complex. Knowledge transfer is not a linear process managed by administrators. It is a matter of culture change, with knowledge as integral to the culture.

Knowledge is socially constituted, and not simply held by individuals. Explicit knowledge is only the tip of the iceberg. We need to address implicit knowledge, and most importantly, tacit knowledge. Knowledge is acquired through shared experience, typically by involvement in a particular form of life, with distinctive language games.

On this basis, it is important to create environments in which experience can be shared, and where knowledge can be given practical meaning. In the context of innovation, we can seek to develop innovation systems, contexts in which new ideas can be developed and applied.

In the context of the workplace, we need to facilitate dialogue, and partnership arrangements which engage the local actors, as well as the social partners and external research resources.

The paper considers four new structures for work organisation which enable experience to be shared, ideas applied, and knowledge acquired: Students' Quality Circles, Senior Quality Circles, Forum Theatre, and Network Consultancy. Conclusions are presented from a feasibility study project based at Kingston Business School, and conducted in association with the UK Work Organisation Network.

Keywords: consultancy, dialogue, forum theatre, partnership, Quality Circles, tacit knowledge, work organization.

1 Introduction

The option of simply maintaining the status quo in knowledge transfer is not available. Cuts in UK government spending on universities, and likely impending increases in student tuition fees, are changing power relationships and assumptions.

Academics have been talking of "student engagement", much as employers have been talking of "employee engagement". In both cases, "engagement" constitutes de facto compliance with the wishes of those in authority. Students are now taking greater account of their own personal investment in fees, and expecting

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service from academics. Students regard themselves as the new masters, as the employers. New models are needed (Nahai et al 2011).

The answer has to be to regard the university as a learning community, with learning as a collaborative activity. In the knowledge society, the university is a knowledge workplace (Gibbons et al 1994; Nowotny et al 2001; Fricke and Totterdill 2004). Old hierarchies are being challenged. Recent administrative superstructures, distant from the learning workplace, have often relied on short-term funding, and may vanish. Non academics have chosen to regard themselves as managers, not required to address or understand knowledge issues, but able to make decisions affecting learning and teaching. This position faces challenge.

We need a new set of practical structures, to empower individuals, broaden participation, and extend dialogue. However, we have entered a new age of austerity. We need to engage in change which uses our own resources, in particular human resources. Learning is not simply to be equated with what takes place in the education system, including universities. Universities themselves need to learn. We need to complement a focus on competition with attention to creating collaborative advantage (Normann and Josendal 2009; Ekman et al 2010; Johnsen and Ennals 2011).

2 Knowledge

It is no longer acceptable to rely on a linear approach to knowledge transfer, top down, whereby teachers, as authority figures, pass on their knowledge. This model does not cover all stages of the process, from research and development, through the ordinary users, including from younger and older generations. Different logics are required at various levels, and, most importantly, we need new buffer zones, including varieties of "Quality Circles" (Hutchins 2008; Chapagain 2006). These act as horizontal filters, between the contrasting discourses on each side, enabling different views and perspectives to be contributed. Dissenting views are not just tolerated, but welcomed as essential seasoning.

Current arrangements for learning and teaching in universities are not sustainable. Mass higher education, with reduced resources made available for teaching, mean that the focus needs to change, as credibility evaporates. Large modular courses are impersonal, with no real opportunity for students and academics to interact. Students may fail their assessments, consider the experience as poor value for money, and leave. Financial and academic judgements are coming into conflict.

The balance needs to change, as between theory and practice. Courses with an orientation towards professional career development should be able to draw on practitioner experience, if they are to be seen as a sound investment of time and money. We should aspire to achieve "skill", and not merely "competence". This means recognising the value of experience, skill and tacit knowledge (Göranzon and Josefson 1988; Göranzon 1995; Göranzon et al 2006). Academic and vocational qualifications alone may not be enough.

The new structures which we have been piloting, and which we introduce in this paper, need not necessarily require the abolition of old institutions. They offer

an alternative horizontal mode of development, a new internal skeleton. In the context of universities, ideas and methods can often be best conveyed by students, taking ownership of their own learning, and creating new enterprises as Change Agents. The students are registered for several different modules, and need to be able to make sense of the differences.

The process of knowledge development is organic. It needs to be driven by those who are themselves engaged in the learning process, rather than detached administrators. Universities are not in the business of widget production. Quality is to be defined within the culture, empowering participants. It is not primarily a matter for external measurement.

Since the 1648 Peace of Westphalia we have had stable national borders in Europe, matched by clear boundaries between the academic disciplines, each with its own institutions and traditions (Toulmin 2001). Such silos are becoming harder to defend in an era of globalisation, and in a context where there are cross-disciplinary platforms and social networks. Our students, oriented towards future employment, find it hard to respect such apparent fragmentation.

3 Dialogue

The industrialisation of education has led to an emphasis on outputs from research, at the expense of a concern for the process of research. This approach reached notable heights of absurdity with the UK Research Assessment Excellence, in which research activities were measured in terms of publications in particular journals. Research itself dropped out of consideration.

It had been assumed that adoption of modern scientific approaches would result in “one best way”. This assumption appears to have been false, as there are divisions across the disciplines, and little direct communication or mutual understanding between technologists and ordinary citizens, particularly from older generations. There is no general agreement on what constitutes evidence, yet there is glib talk of “evidence based decisions” and “evidence based policy”. The truth is that policy determines what is to constitute evidence.

We argue for the importance of dialogue, in education, in the workplace, and in wider society. We can learn from the different views which are expressed. Dialogue need not necessarily result in agreement, but should result in increased understanding. In the European Union, there is a central role for Social Dialogue, engaging the Social Partners (employers’ organisations and trade unions). Dialogue has an important role to play. If we all agreed on everything, learning would stop (Ennals and Gustavsen 1999; Gustavsen et al 2007; Nolin 2009; Ekman et al 2010).

4 Feasibility Study

The Feasibility Study at Kingston Business School provides a fixed period in which to observe the emergence of the new structures, and to see the scope for linkage. We are using external funds to conduct a local field experiment, involving each of the four areas listed below. Pilot activities are organised and evaluated.

This was designed to present and exemplify possibilities, so that other actors can become engaged as active partners, and take co-ownership.

UKWON (Fricke and Totterdill 2004; Totterdill et al 2011) has operated in this way since 1998, with a series of externally funded projects enabling new approaches and structures to be prototyped. Development has been in association with partners across Europe, who are part of an ongoing collaborative community. This means that consortia to respond to European calls are always ready and willing.

5 Quality Circles

Quality Circles have a role at transitional points, such as at the beginning and end of working life, where logics and discourses suddenly change. Transitions are not always neat and clean, and individuals follow different paths. It can help to add delaying functions, introducing diverse perspectives and experience, through Circle members.

Ishikawa first introduced Quality Circles in the automobile industry in Japan, with the objective of empowering workers who were suffering adverse effects from Taylorist scientific management (Ishikawa 1990). The idea was that the workers should take co-ownership of the process of continuous improvement, and take pride in their own skill. Quality was thus a bottom-up process.

Experience in UK industry (and indeed in education) has typically been very different. Quality is seen as a top-down matter for managers, meeting externally imposed targets, and with use of check lists rather than the reflections of experienced practitioners. BS 5750, ISO 9000, Investors in People: in each case, achieving certification of compliance requires payment to be made to an external consultant, confirming that paperwork is in order. To return to an agenda of empowerment we have had to take a circuitous route.

6 Students' Quality Circles

Indian visitors to Japan in 1992 were impressed by what they saw of Quality Circles, which they associated with the long record of Japanese industrial success. Apart from developing a Quality Movement in India, they also sought to transfer this powerful approach to the new context of Education. The starting point was City Montessori School and Degree College in Lucknow, which now has over 35,000 students. A movement developed which has engaged students in schools across India, and in 24 other countries, under the auspices of the World Council for Total Quality and Excellence in Education.

Transferring the knowledge of Quality Circles was far from simple. Quality Circles moved from industrial settings, involving experienced adult workers, to an educational setting, involving groups of children as young as 8 years old. In many cases, Students' Quality Circles have been an exercise in English language and public speaking, providing the opportunity of engagement in a practical case study. Educational institutions have continued virtually unchanged, with control very much in the hands of teachers, and a context of scientific management. There

has been understandable pride in the achievement of the students, but the status quo has not been disrupted.

Following participation by Kingston University staff and student union officers in Students' Quality Circle events in India, Sri Lanka, Pakistan, Mauritius, and Turkey, it was agreed that Kingston University would host the international convention in 2014. It was time to try to transfer knowledge of Quality Circles to Kingston, through new practical activities.

The first Students' Quality Circle at Kingston University, KCircle, came from an undergraduate module in International Human Resource Management (Nahai et al 2011). Students were in part motivated by the opportunity to present at an international conference in India. They learned from the experience, on their return presented to their classmates at Kingston, and then at a Faculty Learning and Teaching Event. As strong final year business students, the KCircle leaders have established their own consultancy company, Change Agents, to operate after graduation, as they start their own working lives.

The students instinctively followed a path consistent with that of UKWON, whose focus has been on workplace innovation. KCircle identified a market for facilitators of change in Higher Education, and recognised that skills can develop based on experience.

During the Feasibility Study project the KCircle / Change Agents presented to full time MBA students, engaging them in the change process. The MBA, around the world, is a relic of an Anglo-American model of business which is now broken. The financial market system collapsed. The case for developing new generations of general managers, as if nothing had happened, may be flawed. The Kingston MBA requires five years of relevant management experience before the course, and reflection on that experience is a key resource. However, many of the general management textbooks are now obsolete. New approaches are needed. Our students will ultimately gain competitive advantage, through experience of creating collaborative advantage. This requires engagement in practice.

7 Senior Quality Circles

The Senior Quality Circle in the Department of Informatics and Operations Management brings together academics from different discipline backgrounds, with varied professional experience, and assorted elderly relatives. It is a repository of wisdom and tacit knowledge, and the core of a daily lunch club at the Kingston Hill campus, which is usefully situated some miles from alternative catering facilities.

A large proportion of the academic staff of the department are now aged over 50: they would be classified as "Seniors" in Norway, where the Centre for Senior Policy has been addressing practical issues of demographic change, and making special provision for the workplace needs of older workers (Ennals and Hilsen 2010). Those who are aged over 55 could be eligible for Voluntary Early Retirement. However, taking such retirement can mean making a complete break with the workplace. Vital human resources are likely to be lost, individually and collectively. This is an international problem (Hilsen and Ennals 2009; Augustinaitis et al 2009; Ennals and Salomon 2011).

A Senior Quality Circle can reflect on and value the experience, skills and tacit knowledge of the members, and provide a supportive transitional environment which can enable smooth transitions at the latter end of working life. Under European Discrimination Directives, mere chronological age is not a reason to be removed from the workplace. There may be continuing contributions, whether part time, full time, or in the form of consultancy. There can also be support for contributions to life outside work, both before and after retirement.

Demographic profiles of academic workforces suggest that a high proportion of academics are now close to retirement. Younger academics may be more likely to have PhDs, but less likely to have professional experience of working life. In a Business School, this has serious implications, for the learning and teaching culture.

8 Forum Theatre

Forum Theatre brings drama into the workplace, exploring relationships in light of external parallels (Fricke and Totterdill 2004). In employment relations, we often talk of the "workplace actors". In Forum Theatre the actors are also researchers, who investigate a case study situation, and develop a piece of drama. This is presented in the workplace, in such a way that workers and managers can respond, relate to the stories and relationships which are being presented, and eventually intervene in the drama, directing proceedings from the audience. Such interventions can lead to ongoing change processes, jointly owned by audience members.

As part of a project "Dramatic Innovation", Kingston Business School will host a production at the Rose Theatre, for a business audience. An earlier presentation will offer the opportunity for MBA and other students to engage. Kingston University are major sponsors of the Rose.

9 Network Consultancy

Network consultancy enables constructive collaboration across institutional and departmental boundaries. It enables individuals to link up to meet needs of third parties, in a context of trust and partnership. This is particularly important in a business environment when things have fallen apart. Discretionary budgets have been reduced. Needs continue. Gaps increase.

UKWON is developing innovative new approaches, building on unique tripartite engagement with trade unions, employers' organisations and government, as well as universities and research organisations. UKWON has recognised that many older workers re-label themselves as consultants on retirement (whether voluntary or otherwise), partly to retain their own self image. The transition from employee to consultant is not always easy. Collaboration may be unfamiliar.

10 Building on What Is Feasible

Following the feasibility study project, next steps will be driven by practical human need, rather than rhetoric.

One current area for potential development is "Assisted Living", where government is concerned to increase the market for technology vendors, with a view to reducing care costs for the increasing elderly population. It is not enough to push a technocentric view. In order to find human centred solutions for elderly users, intermediate structures are needed, as outlined in this paper. The Feasibility Study project could lead to submission of a major funding bid.

There is also a case for testing the feasibility of syntheses of the structures outlined above. We are advocating a bottom-up approach to change, and are thus not obliged to present a single top down structure to be "rolled out".

A physical example can help to illustrate what is possible. The Matara Centre in the Cotswolds can host organisational dialogue processes, as well as weddings and funerals. Decorated in North American Indian style, the "Council Room of the Elders" provides a suitable and evocative environment for dialogue by a particular Senior Quality Circle, for which on-site accommodation is available. The wider theme of East / West fusion inspires creative flair. The Hilarium Room can host Forum Theatre. Supporting networks from academia, workplace innovation and consultancy can add value to and underpin network consultancy. Ongoing mentoring is available following events.

11 Conclusions

Transferring knowledge is more complex than many people have imagined. It is not like "passing the parcel", with a zero sum game. Tacit knowledge is important, but resists easy transfer.

The status quo in education, work and knowledge, is not a sustainable option. Transition points at the start and end of working life have key roles; new structures can be deployed.

Brief histories of the example structures highlighted the complexities involved in moves between countries, sectors and generations. It is not just a matter of "rolling out" change.

Exploration has begun into how some of the particular challenges of demographic change can be addressed. Instead of regarding age as a form of medical problem, it can be seen as providing invaluable resources of experience, skill and tacit knowledge. Having recognised that potential in older people, the benefits of retaining access to such assets become evident.

The Senior Quality Circle has the potential to benefit its members, the organisation in which the members are currently employed, and wider society, for which they can act as a powerful filter for projects concerning intergenerational relations. There will need to be arenas in which such work can be taken forward. The Matara Centre is one potential venue. Poltimore House, near Exeter, is another. There could be a nationwide network.

Showing the feasibility of one or more components does not in itself guarantee the sustainability of a system constructed from such components. Human beings, and the organisations in which they work, have a remarkable capacity to foul things up, with or without the use of computers (Ennals 1995).

Social science researchers have interpreted the world of which they are part: the problem is to change it. It is not sufficient to criticise conventional accounts of knowledge transfer. This paper has introduced key components for a feasible set of alternatives. There is work to be done.

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Structured Knowledge Transfer for the Implementation of a New Engineering Service Centre in India

Results from a Captive Offshoring Project in the Automotive Supplier Industry

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Abstract. Organizations are continuously confronted with stress of competition. The search for lower operational costs is no longer limited to the manufacturing and information technology field and has been extended to engineering services as well. For comprehensible reasons more and more tasks in the engineering service sector are shifted towards India. Along with this, international companies plan at least partly to transfer firm-specific knowledge towards India so that knowledge management has become a key success factor for the performance of plants or subsidiaries in India. This contribution focuses on a research project dealing with the knowledge transfer processes of a global automotive tier 1 supplier to its joint venture in Pune, India. Knowledge transfer processes as part of a holistic knowledge management approach were essential for the success of these off-shoring activities. The major goal of this contribution is to show how this offshoring project was carried out from a knowledge management point of view. This provides deeper insights into the course of action related to knowledge transfer processes between the two locations in the US and India. An internally developed knowledge transfer model leveraged a combination of experienced resources from the joint venture, with task based training and documentation of knowledge and practical cross cultural orientation and assimilation of teams to quickly initiate the new operation. Finally the paper will demonstrate how an above average steady state level can be reached by progress tracking and feedback mechanisms. Furthermore the paper will provide a brief overview of the existing theoretical dominant factors of successful knowledge transfer which were distilled out of empirical studies and prior research in this field.

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1 Motivation, Background and Research Method

More and more tasks are being transferred by manufacturing and service industries to countries like India, China, Malaysia, etc. In the last years India has become the hub of service industries worldwide due to a growing number of highly educated, young and English speaking people, stable economic conditions and low labour costs as compared to other industrialized nations. Companies who would like to benefit from these conditions must transfer at least parts of their activities to India.

The findings presented in this paper result from a joint project between the University of Passau and a global automotive tier one supplier. The partner company is a worldwide technological leader in this branch. Confronted with a downward spiral of business prospects the company had to realign its engineering services by relocating about 30% of its R&D activities to its joint venture in Pune, India, in order to adjust the cost structures and to react to changing market requirements. An immediate consequence is that firm-specific knowledge has to be transferred from the US headquarters to India. Therefore knowledge management (KM) has become a key success factor not only for the overall firm performance but also for performance of the service unit. The major goal of this contribution is to show how this offshoring project was carried out from a KM of view. This will provide deeper insights into the course of action related to knowledge transfer (KT) processes between the two locations in the US and India. In the first part it will be demonstrated how the prearrangements for the KT were developed. This includes the need and the development process of a shared vision as well as knowledge transfer objectives and a strategy. Subsequently the KT process itself will be illustrated in detail. Finally the paper will demonstrate how an above average steady state level can be reached by progress tracking and feedback mechanisms. The findings of this case study are based upon action research methodology and can be, at least partly, adapted to similar situations.

According to Avison et al. action research combines theory and practice (and therefore researchers and practitioners) through change and reflection in an immediate problematic situation within a mutually acceptable ethical framework and can be described as an iterative process involving researchers and practitioners acting together on a particular cycle of activities, including problem diagnosis, action intervention, and reflecting learning (Avison et al. 1999). McKay & Marshall (2001) propose that action researchers should consider two parallel and interacting cycles: the research cycle (which is focused on the scientific goals) and the problem-solving cycle (focused on the problematic situation). Accordingly a pooled cycle of academic researchers as well as practitioners of the cooperating company was permanently implemented for this research project (see Warth 2009).

2 Related Work and Main Influence Factors for KT

After analyzing the last fifteen years of research in the area of KT processes 21 quantitative studies were found which scrutinize the key factors influencing KT within multinational companies or within alliances (see Lehner/Warth 2010).

At this point it is important to note that none of these publications considered here studied the same or a comparable situation so that a deficit in research and a lack of common understanding has to be stated. Because of their empirical approach it was decided to rely on quantitative models as they allow replication to some extend and at least check if the influence of a certain factor is significant. These factors form the basis of improvements in this project which aims to demonstrate that KT processes can be managed successfully by obeying theoretical insights. Table 1 summarize those influence factors and describes them briefly.

Table 1 List of main factors influencing KT processes

Factor	Description	Reference
Sender	Also disseminative capacity; ability and motivation of an employee to share knowledge	Minbaeva (2004)
Tacitness	Implicit and non-codifiability accumulation of skills	Zander/Kogut (1995)
Complexity	Number of critical and interacting elements embraced by an entity or activity	Hayes/Wheelwright (1984)
Specifity	Transaction cost's asset specifity	Reed/DeFillippi (1990)
Teachability	Extent by which know-how can be taught to new workers	Hayes/Wheelwright (1984)
Reciprocity	Sum of a partner's account of the resources committed by itself and its perception on the extent of resources committed by the other party	among others: Williamson (1991)
Codifiability	Extent to which the knowledge has been articulated in documents	Kogut/Zander (1992)
Ambiguity	Extent with which the knowledge can be transported, interpreted and absorbed	among others: Kogut/Zander (1992)
Recipient	Employees' job related abilities and overall competencies, job related motivation, involvement, job satisfaction, absorptive capacity (overall ability and willingness to absorb new knowledge)	Minbaeva et al. (2003)
Learning intent	Degree of desire for internalizing a partner's skills and competencies	among others: Hamel (1991)
Cultural distance	People from members of our corporate global network including our parent tend: 1) to think like us and 2) to behave like us	among others: Lin/Germain (1998)
Relationship	Degree of involvement in MNCs network	./.
Ability-based trust	The focal party's perception of the partner's capabilities, knowledge and skills related to alliance	Mayer/Davis (1999)
Benevolence-based trust	Extent to which the focal party perceived the partner would not intentionally harm its interests	Mayer/Davis (1999)
Integrity-based trust	The focal party's perception regarding partner's fairness, sense of justice, consistency and values	Mayer/Davis (1999)

It has to be added that in this specific project it was not aimed to evaluate or improve KT models but instead to use their practical implications to support management in a specific case of KT. Hence only those factors were used for which a common acceptance can be assumed. The factors listed in table 1 refer to an ideal KT process consisting of four components. These components are: sender, recipient, the knowledge to be transferred, and finally the environment in which the KT process is embedded.

3 Prearrangements for KT

To prepare the organization for the new offshoring model, managers from the two locations met for an initial due diligence activity to understand the work (tasks) done in the different departments, functional roles executing the task at the sending location. The complexity level of these tasks was determined by analysis for intensity of collaboration and domain knowledge. This resulted in a finite set of tasks that were deemed offshore-able.

Phase	#	Deliverable / Task	Rating: Domain Knowledge	Rating: Degree of Interaction	Off-shorability	Wave	Requester / Owner / Functional Role
2	6	Validate / reconfirm price/capacity on c/o parts	2		2	Wave 1	Buyer
2	9	Pre-selection of SSC parts/suppliers	2		1	Wave 1	Buyer
2	11	Add New Suppliers	1		1	Wave 1	Buyer
2	13	Request for quotes sent out to supply base	2		1	Wave 1	Buyer
2	15	Quote analysis and BASICS completed	2		2	Wave 1	Buyer
2	16	Logistics Calculation requests per part	2		2	Wave 1	Buyer
2	20	Complete SSC supplier decision sheet	2		1	Wave 1	Buyer
2	28	Develop overall supplier timeline	2		2	wave 1	Buyer
2	33	Send Confidentiality Agreements to potential Suppliers	1		1	Wave 1	Buyer
3	4	Send out RFQ's to supply base	2		1	Wave 1	Buyer
3	5	Quote analysis and BASICS' filled out	2		2	Wave 1	Buyer
3	11	Issue order for prototypes	2		1	Wave 1	Buyer
4	1	Quote updates according to last requirements-Final	2		2	Wave 1	Buyer
4	4	Issue SA	2		2	Wave 1	Buyer
4	5	SAP, GRIPS and XPPS Maint.	2		2	Wave 1	Buyer
4	6	Notify Behr Service of 'dead parts' for carryover business (Brian Stone)	1		1	Wave 1	Buyer
4	9	Quote EVs/ECR's	2		1	Wave 1	Buyer
4	11	Manage Tool Database - Tool Survey	2		1	Wave 1	Buyer
4	12	Manage Supplier DP's (SREAEs / Deviation Permits)	1		1	Wave 1	Buyer
5	1	Order parts for machine run off, FST and track	2		2	Wave 1	Buyer
5	3	Technical change management (ECR)	2		2	Wave 1	Buyer
		MSA/All documents; Routing Page	2		2	Wave 1	Buyer

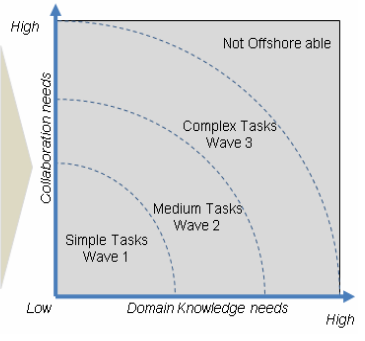

Fig. 1 Due Diligence – Break down of tasks and clustering by waves

Based on this process, the wave 1 functions were determined as design, simulation, quality, process planning across all product lines, wave 2 was determined to be product engineering, program management and cost estimation, wave 3 established scale to the operations. This then was followed by defining job descriptions and resource assignments to the different functional roles. Minimum entry criteria for resources were established in terms of qualifications and foundation knowledge needed before the resources arrived in the US. Trainers from the parent in Stuttgart traveled to train the resources on standard engineering tools. Dedicated training plans were created for each of the individuals by the sending organization based on the minimum entry criteria and focusing dependent on their prequalifications.

4 KT Process

Figure 2 shows the overall timeline and transition process for this project.

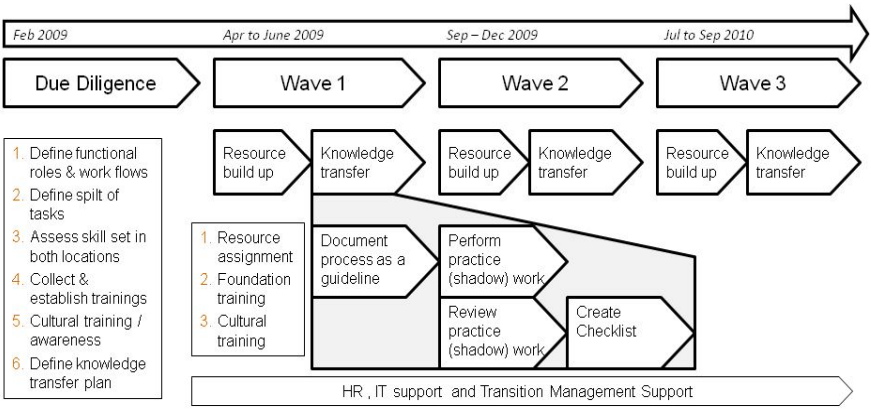

Fig. 2 Overall transition process

A team of transition managers at both locations prepared the sending and receiving organization with an overall plan for the KT, explaining how the process works and expectations from the resources on both sides. Additionally the teams were exposed to cultural orientation trainings. By execution of those one day trainings it was possible to improve the collaboration between the two parties. An Indian employee who works permanently for the sending organization could be enabled to present measures how to improve the virtual teamwork. In doing so the US participants (mostly designers or team leaders) learnt multilayer aspects in team working with their Indians counterparts (e.g. intercultural facets, technical aspects, organizational issues). Those trainings were planned to carry out also at the receiving side from a US expat with similar contents adjusted for the Indian members. Finally a week before the Indian team arrived to the US, physical space for working, IT set up like phones, computers etc was organized. HR teams were prepped to conduct a training program on the lines of the "new hire orientation". Managers from the US were prepped to keep the first day of reporting open to communicate expectations, offer openness to meet the new teams and support to resolve any issues they face during the process.

Most of the technical knowledge was documented and available on-line in an internally development system known as BDS which was globally accessible for all employees. The BDS housed all relevant standards, guidelines, manufacturing requirement and technical specification for all the product lines. However it did not capture nuances that people followed in day to day work or requirement that were unique to meeting the North American market customer needs or manufacturing plants. Examples of such kind of information would include

- Preparing CAD deliverables per OEM standards
- Documenting DFMEA, PFMEA per internal standards or migrating an existing one to an OEM specified format
- Translating DVP&R into test orders in the test request system
- Developing control plans and like wise

It was essential that the knowledge transfer team captures this information and documents this. To enable this, a separate section in BDS was created to capture this kind of information. A process as described in figure 3 was deployed to enable robustness of the documentation. A key point was incorporation of a loop to review the editorial aspects of the document prior to reviews by the US Managers. The collaborative element ensured that the management teams in both organizations were aligned in how the work was currently being performed.

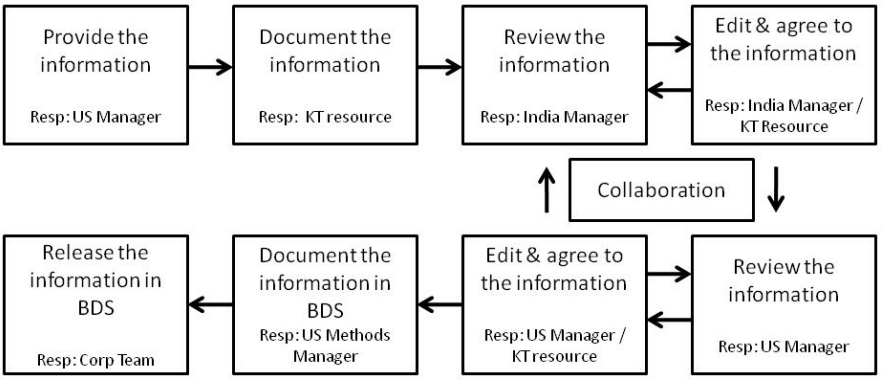

Fig. 3 Documentation of the transferred knowledge

The teams then performed work per the new documented procedure. This is shadow work which was then reviewed by their US counterpart. The review process was captured by means of a checklist. Several iterations of similar tasks were performed to ensure the robustness of the process and checking documentation. This also served to build confidence in the KT resource as well.

Towards the end of each wave each team created a simulated offshore environment, by deliberately moving the KT resources to another building away from the US teams for two weeks. Tasks were provided and additional information passed on using electronic forms of communication such as phones, emails, chat or desktop sharing. The results were reviewed and documentation further strengthened based on the observed failure modes. Another advantage of the "little India environment" was that it gave a firsthand impression to the US resources as to how the business model would impact their day to day work.

5 Steady State of KT

On return to India, the KT team had to create one final deliverable which was called as the "Procedure Manual". The procedure manual was the document that links the process as described in the US with the way it will be actually performed in India. Table 2 shows the key contents of the procedure manual.

Table 2 Content of procedure manuals

Chapter	Key question	Contents
1	How are the tasks requested?	Required inputs, input review, time/cost estimation
2	How are the tasks executed?	Working process, issue and status reporting
3	How are the tasks reviewed?	Checklists, error reporting, fixing errors
4	How are the tasks delivered?	Assumptions, issues, acceptance notes
5	How are the tasks accepted?	Closure, rework, feedback, lessons learned, billing
6	What reference information exists?	Guidelines, standards, expert list, methods, forms

The information in the KT phase at the US covers one aspect of chapter 2 and 3, however recognizing the fact that an entire organization does not turn up for KT, only a small representative team is sent, it is essential that a holistic approach to ensure quality of service is addressed. This deliverable is due back to the sending location within three months of completion of KT, return of the team to India and start of the engineering service.

6 Governance – Ensuring an Effective KT

One of the challenges while executing a knowledge transfer program is to ensure that all tracks (functions) which are off-shored to the engineering service are moving at a steady pace. Any deviation is quickly identified and fixed at the very earliest. The framework is as shown in figure 4.

The monitoring framework focused on the end to end process was established. Successful completion of the pre-arrangement phase was a necessary criterion to migrate to task training and documentation. Likewise successful evaluation of the shadow work with a feedback rating of 3.25 on a scale of 5 was necessary to authorize "Go Live" for that function. This milestone indicated completion of KT and start of payable work from India. Slow movers were identified and Go Live dates adjusted as needed.

Figure 5 shows finally how the KT was tracked from a progress side by linking the monitoring framework to the nominated resources and function areas.