Knowledge Exchange in the Digital Media Industries

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Abstract

This paper seeks to examine the mechanisms and motivations for University-Industry knowledge exchange (KE) with the digital media industries using survey, interview and case study evidence. It begins with a discussion of the terminology, mechanisms and motivations associated with KE. Evidence of the motivations of participants in KE are then examined through survey and interview evidence with the computer games industry and stakeholders. It concludes by examining new KE mechanisms via a Scottish case study in the digital media industries.

Key words: knowledge exchange, knowledge transfer, creative industries, and computer games, SME

Introduction and Literature Review

Given the imperative for academic research to have more impact in return for investment, university-industry relations merit examination. While sectors such as engineering and medicine have a longer history of engaging with university research, the Creative Industries are relatively new to forms of Knowledge Exchange[1] (KE). Using survey, interview and case study data, this paper examines Knowledge Exchange in the digital media industries, with specific emphasis on the computer games industry.[2]

Knowledge Exchange describes the flow of information between different research environments. However, the term is only one of many to define the transfer of knowledge between sectors. Other terms, which have previously been popular, include Knowledge Transfer[3] (KT), Knowledge Brokerage[4], and Knowledge Mobilisation[5]. KE distinguishes itself from alternative definitions as it suggests multidirectional knowledge flows in collaborations with academia. Related concepts include co-creation and co-innovation, which are not considered here.

While Knowledge Exchange and its related practices appear to be relatively new to the Creative Industries[6], they have long been used in other sectors such as the international development and healthcare sectors. The lack of track record and

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[1] KE is defined as "collaborative project work with academics, which involves the discussion, exploration and exchange of ideas; or delivery of joint programmes." (Scottish Government, 2010)

[2] We define industry in this context as for-profit firms in the digital media creative industries. The Department for Culture Media and Sport (DCMS) (2006) defines CI as twelve creative sectors; here we refer to the sector defined as software, computer games and electronic publishing, which we will collectively refer to as the digital media CI. Parts of this paper will more specifically refer to the computer games industry or computer games development industry. Other authors may refer to computer games as the video games or interactive entertainment industry. The computer games development industry is concerned with the making, designing and selling of games as opposed to the technological platforms and retail distribution outlets.

[3] Knowledge Transfer is "the one-way transfer of skills and expertise from academia to government to inform the delivery and development of government policy." (Scottish Government, 2010), However, this definition is often widened to include transfer from academia to industry.

[4] Knowledge Brokerage is defined as, "activity that 'links researchers and decision makers together, facilitating their interaction so that they are able to better understand each other's goals and professional culture, influence each other's work, forge new partnership and use research based evidence." (Canadian Health Services Research Foundation as cited by Scottish Government, 2010)

[5] Knowledge Mobilisation is the "strategic dialogue carried out between Government and Research Councils to create the necessary 'authorising environment' and reward structures for knowledge transfer and knowledge exchange activity to take place." (Scottish Government, 2010).

[6] Searching Google Scholar (March 1, 2013) for variations on KE and CI produced no papers on the subject; this suggests that the area is relatively new. However, this could reflect trends in terminologies rather than research trends.

analysis in the Creative Industries could be attributed to many potential factors including: lack of funding for projects, informal nature of Knowledge Exchange in the Creative Industries, non-existence of such KE projects, lack of positive outcomes in KE projects. Other studies have considered whether sector affects Knowledge Exchange. Bekkers and Freitas (2008) examine the impact of sector on KT channels. While they fail to find any relationship, their study does not examine the arts and humanities. Docherty (2010) considers the educational role of universities as means to providing a competitive advantage to the Creative Industries but focuses less on KE. This paper begins to fill the gap in the literature via a combination of survey, interview and case study evidence, which examines the motivations of industry in engaging in industry-university KE collaborations.

Industry – University Collaborations

This research investigates the views of industry – university collaborations and the goals of partnerships. All industry members surveyed intend to maintain or increase their involvement with universities in the future. However, industry would like to see improved speed, flexibility and pro-activeness on the part of universities.

Top 3 Areas for improvement in collaborations: What industry would like to see in universities
Speed
Flexibility
Pro-activeness

The research also confirms anecdotal evidence of a gap between the expectations of industry and academia with regards to Research and Development (R&D) collaborations. The research finds that the primary goals of industry involvement with universities are the recruitment of graduates, identification of new business opportunities, maintaining an ongoing network with the university and promoting the organisation's brand. Notably low in industry's goals are R&D related activities and staff training. As these views differ from the goals of universities and agencies, more work needs to be done to understand how these views can be aligned.

Top 4 Goals of Industry support of University-Industry projects (in descending order)
To recruit university graduates
To identify new business opportunities
To maintain an ongoing relationship and network with the university
To promote organisation's brand

While the sample size is small, one theme emerging from the research is the highly diverse nature of the goals of second and third sectors.[7] There is also limited evidence that the second and third sectors see graduates as less prepared than industry does, and rank training and R&D related activities in collaborations higher than industry.

Assuming the availability of funding and the importance of achieving research impact, the primary purpose of this paper it to investigate the motivations of industry partners. To start, funding for KE projects abounds.[8] This poses two potential problems: one, there may be mismatch between funding and industry demand and two, potential industry partners may find the diverse array of potential funding available to support university collaboration confusing. This is a challenging task for both brokerage bodies and universities themselves.

A secondary purpose of this paper is to comment on the mechanisms through which industry-university knowledge exchange occurs. Matching the motivations of industry with successful outcomes through strategic KE mechanisms should improve the impact of KE projects. These mechanisms include, but are not limited to, placements, consulting, workshops, networks and voucher schemes. Placements involve having staff members in either university or industry spend time in project partners' offices and can range from secondments to work shadowing. Consulting encompasses the application of professional expertise for the benefit of a third party (Aston University, 2013). Voucher schemes also vary but can be describes as certificates, which can be used towards purchasing university resources such as academic staff time.

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[7] We define the second and third sectors as the public and voluntary, cultural or community organisations, respectively (Sepulveda, 2009.)
[8] An examination in November 2012 found that the Scottish body responsible for connecting industry and universities, Interface, listed nearly 60 funding schemes for potential KE projects in Scotland.

The existing body of literature has much to say on successful mechanisms for KE in sciences. For example, Jacboson et al (2005) argue in favour of consulting. Likewise, Lavis et al (2003) generate a five-question framework for developing mechanisms in the medical sciences. Grimpe and Hussinger (2008) argue that a combination of formal and informal mechanisms leads to more effective KE. Yusuf (2008) also finds in favour of a mixed approach in which no single mechanism or set of mechanisms is ideal.

At a more general level, successful Knowledge Exchange requires an overarching structure. Acworth (2008) argues in favour of an overarching structure known as a Knowledge Integration Community (KIC) which comprises six components: university research, industry, government, education, knowledge exchange and studies of innovations in knowledge exchange. In a report into Knowledge Exchange between the Biotechnology sector and universities Pew (2001) identifies four elements of a successful University – Industry Relationship:

1. Scientists are primary contacts that establish the relationship.
2. Flexibility exists for industry and the university.
3. Trust among scientists is crucial; and
4. Researchers need to understand but not focus on legal and IP issues.

Structural differences in the culture of industry and university merit consideration in KE. Given the incentive structure of universities is based on peer-reviewed publications, successful funding and, to a degree, teaching. In 2014 the UK changed its university assessment structure to explicitly "assess the non-academic impact of research" (REF, 2014), which has a weighting of 20% for the overall assessment. Research outputs contribute 65% of the assessment which suggests that peer-reviewed publications dominate the incentive structure of universities and continue to form the basis of allocations of funding, career progression and research reputation. Thus, the incentive structure of universities is heavily biased towards research output. These outputs do not necessarily align with KE partner priorities.[9]

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[9] Interestingly, the REF 2014 document which details the definition of impact does not include the term KE or its related terms.

From the industry perspective, profit is a key consideration. While other incentives may play a part, industry must at least break even to survive. In the Creative Industries, a second key factor is their distribution, which is marked by a pareto distribution with a lot of small firms. To the university, engagement with a large number of small firms is relatively more costly than with a small number of larger firms. As noted in a Scottish government (2009) report,

> The creative industries sector is characterised by small businesses. In 2008, 97% of enterprises were small (0-49 employees). … Despite accounting for the majority of enterprises, small firms accounted for just 36% of employment in the sector. Conversely, whilst large firms (250+ employees) represented just 1% of enterprises in the sector, they accounted for 52% of employment in 2008.

As Caves (2002) notes this size distribution and argues that the Creative Industries are unique in their economic structure with their complex product nature, the intrinsic motivation of labour, uncertainty, and product variety. This combination of a skewed size distribution and unique economic characteristics means that KE in this sector may require different approaches.

Industry's demand for these collaborations has been examined over the years.[10] Romero (2008) identifies four major motivations for industry engagement; these are obtaining early access to scientific breakthroughs, increasing the applied power of sciences, delegating selected development activities and lack of resources. Carayannis et al (2000) and Hall (2001) cite similar rationales. This paper furthers this work by examining the motivations of the computer games industry.

The paper is divided into five main sections. The next section presents the research design and methodology. The following two sections present the results of the consultation with industry and second and third sector perspectives. The fourth section presents a case study and the final section concludes.

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[10] University demand for KE has also been examined as in Andersen and Rossi (2010), "The Flow of Knowledge from the Academic Research Base into the Economy: the Use and Effectiveness of Formal IPRs and "Soft IP" in UK Universities" *UK Intellectual Property Office*, available at http://www.ipo.gov.uk/ipresearch-flow-201010.pdf

Research Design and Methodology

The research has two main threads; an online questionnaire and in-person interviews. The sample for both of these instruments was the same. The sample was a list of roughly 70 members of the Computer Games Development industry. Approximately one third of these were classified as second and third sector (including government agencies, NGOs, lobbying groups etc.) and the remaining two thirds were commercially active firms. Participants occupied a variety of roles including studio managers, team leaders, programmers and CEOs.

In-person Interviews

- **Sampling frame:** Non-probability sampling using a snowball sampling technique
- **Population:** Computer Games Development Industry (recruitment agencies, developers, publishers)
- **Sample**: A list of 70 members of the Computer Games Development industry with known contacts within the University of Abertay Dundee.
- **Type of Survey:** In person interviews
- **Survey instrument:** In person, structured, confidential interviews using the Responsive Interviewing Model

Interviewees were invited via a combination of telephone and e-mail invitations. Most requests were positively received although one third of requests were declined or received no response. The average interview lasted 40 minutes. Interviewees were asked questions appropriate to their area (see Appendix 1) which were designed to explore the dynamics of the topics of interest.

In total, 17 formal interviews have been conducted with key members of the Computer Games Development.

Table 1: Interviewee Types

Interviewee	Count
Industry	13
Second and third sector	5
Total	**18**

Table 2: Interviewee Locations

Location	Count
Dundee	9
Glasgow	2
Newcastle	2
London	5
Total	**18**

- **Type of design:** descriptive (cross-sectional)

- **Sampling frame:** Non-probability sampling

- **Population:** Computer Games Development Industry (recruitment agencies, developers, publishers)

- **Sample**: A list of 70 members of the Computer Games Development industry with known contacts within the University of Abertay Dundee.

- **Type of Survey:** Self-administered online questionnaire

- **Survey instrument:** Anonymous online survey administered using Survey Monkey[11]

The breakdown of response rate is as follows:

Table 3: Online Survey Response Rates

	Total	Industry	Second and third sector
Contacted	75	56	19
Partially Completed	5 (7%)	5 (9%)	0 (0%)
Completed Survey	16 (21%)	11 (21%)	5 (26%)
Partially Completed or Completed Total	**21 (28%)**	**16 (30%)**	**5 (26%)**

Table 3 above indicates the response rates for the online survey, which resulted in an overall response rate of 28%.
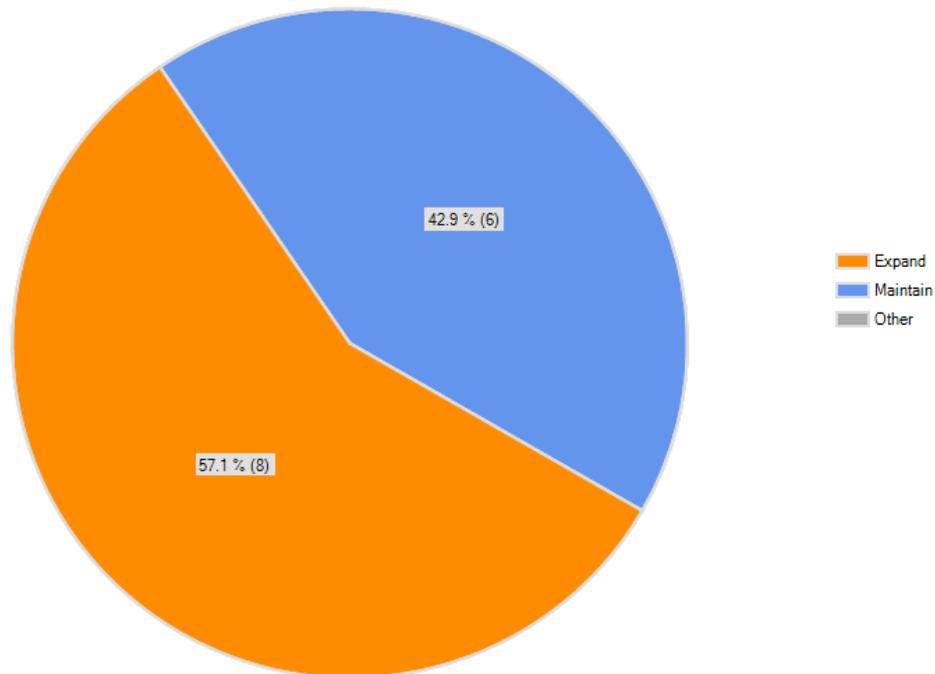
University-Industry Collaborations

Industry's Goals and Intentions

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[11] An online, self-administered survey was set up using SurveyMonkey.com. The survey resulted in 21 responses although not all respondents completed the survey. Three potential respondents opted out of the survey. Respondents were initially contacted via an introductory e-mail in August 2009. This was followed by an invitation to complete the online survey and two follow-up e-mails three and five weeks later. Following a review on non-respondent contacts, 15 contacts were targeted and sent a personal e-mail.

The online questionnaire provided a clear picture of the goals of industry in engaging in collaborations. As Figure 1 indicates, 100% of respondents plan to maintain or expand their collaborations with universities. The majority (57%) plan to expand their collaborations.

Figure 1: Industry's plans for collaborations

Considering your organisation's overall experience with industry-university collaborative projects or programs, do you think your organisation will expand, continue, or reduce work with universities in the future?

Additionally, when asked what they would like to see out of collaborations, industry ranked the recruitment of university graduates as a primary goal (71% of respondents) closely followed by the identification of new business strategies as seen in Figure 2.

Figure 2: Industry's goals of collaborations

How should industry-university involvement assist your organisation in the future?
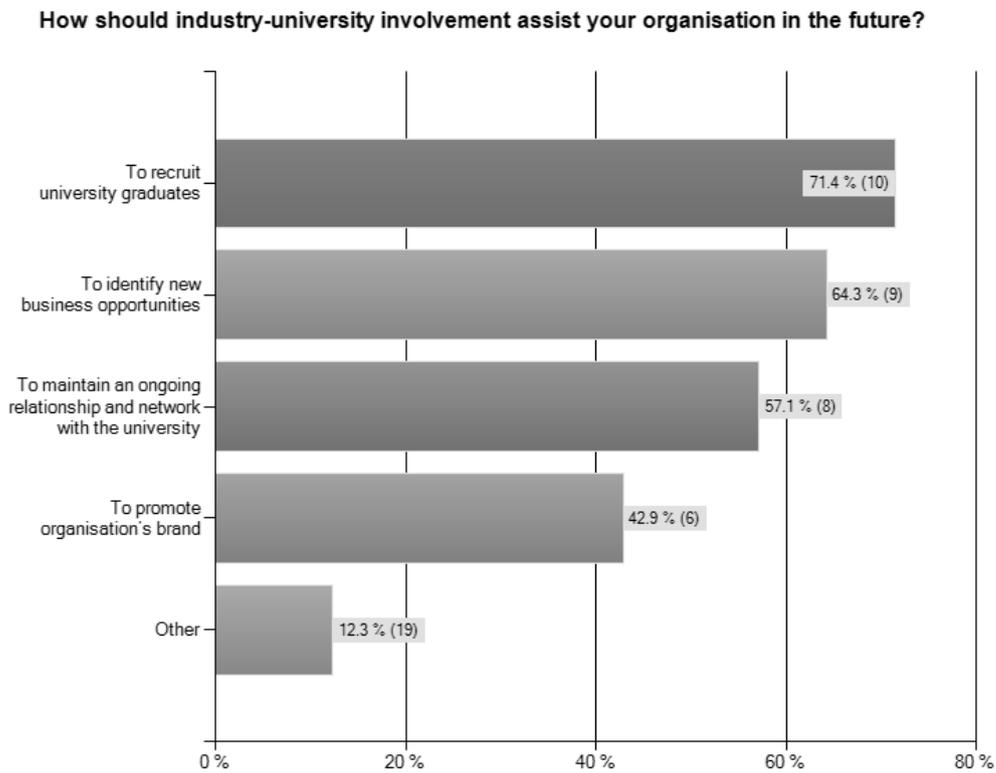
Online respondents were also asked, separately, what their goals were with financial and non-financial support of collaborations. Of all respondents, 64% had committed financial resources to support university-industry projects and 71% planned to do so in the next year. 86% of respondents had committed non-financial/in-kind resources to university-industry projects and, of those, all intended to continue to do so in the next year. The top four goals of financial and non-financial support of university-industry projects were consistent across various questions, as seen in Table 4.

Table 4: Goals of Industry Support of collaborations

Top 4 Goals of Industry support* of University-Industry projects
To recruit university graduates
To identify new business opportunities
To maintain an on-going relationship and network with the university
To promote organisation's brand

includes financial, non-financial and future support

Notably low in the rankings were the categories "To train current staff" and a multitude of R&D related categories including the following:

- To conduct ''blue sky'' research in search of new technology
- To reorient R&D agenda
- To conduct research leading to new patents
- To gain access to equipment
- To conduct fundamental research with no specific applications in mind

This is potentially at odds with the high ranking of "to identify new business opportunities" which can be interpreted to include the above listed R&D activities. This could indicate that industry sees "new business opportunities" as funding or other opportunities separate from a research agenda. Further work should be done to properly identify how industry defines "new business opportunities." This underscores the fact despite being receptive to university input in identifying new business opportunities, industry remains reluctant to engage in what they identify as collaborative R&D efforts.

Areas for Development

Interviewees identified a number of areas for development in these collaborations. These are: the speed and flexibility of universities, the pro-activeness of universities and a reluctance to engage in R&D collaborations with universities.

40% of interviewees raised the subject of the speed and flexibility of universities as being a disincentive in collaborations. Academia must, but its nature, focus on long-term education and research goals. The "product cycle" of four years for the production of each graduate also builds in an inherent inflexibility compared to the highly reactive production processes of computer games. Academia is also subject to external demands from parents, students and governments. Industry, with its for-profit nature, is dictated by the fast moving marketplaces and the changing whims of the consumers. Bridging the gap between these two cultures requires mutual understanding of the differences.

To illustrate the difficulties caused by a lack of speed and flexibility, interviewees volunteered the following anecdotes:

"There is also an issue with degree of speed and flexibility – when can we meet? When can I get a proposal done? Processing an invoice on time, delivering on time can all be issues. As an example, I recently met with a researcher and was discussing a project. I had in mind in the next couple of months. The researcher asked "What about next April?" I can't wait that long. Traditional universities often go at a glacial pace." *Industry*

"The process (of industry-university collaborations) has been slow starting but seems to be picking up. I've heard of one person who found it took 3 months to get an NDA signed." *Industry*

"The ability of relevant (university) departments to work together – e.g. contracts/legal with finance with researchers – is important. They often have three different policies and, from an industry point of view, we really don't want to have to deal with three different departments. A lot will depend on our primary contact and their willingness and ability to cajole the other departments." *Industry*

A desire for pro-activeness on the part of universities was also cited by 30% of interviewees. This pro-activeness ranged from email "pings" to more formal overtures in collaborative projects. The following quotes from interviewees further illustrate industry's call for enhanced pro-activeness and communication:

"You also have to get lucky with timing – and you have to be persistent as we may or may not always reply – persistence and being proactive make a difference." *Industry*

"Keeping the contact going is also vital." *Industry*

The research indicates that there is still a general gap in terms of the perceptions and goals of universities and industry in collaborative partnerships. Whereas current funding emphasises KE, the computer games development industry associates collaborations with R&D projects. The industry feedback below points to industry's focus on R&D in collaborative projects:

"Everything we touch needs to be commercialised – so the student's research may not fit. However, placements seem to be going really well." *Industry*

"We don't need that external R&D because we're constantly striving to innovate with our own experts, how on earth could a student do this?" *Industry*

Of interest is that interviewees specifically refer to the idea of students performing R&D work; industry may associate university collaborations with students and not academics. These quotes collectively evidence that potential collaborations with universities are often

perceived by industry as outsourcing R&D and not as KE partnerships. Interviewees also indicate that the Computer Games *Development* Industry identifies itself as a R&D focused and innovative industry. Given this identity and the perception of collaborations, the evidence suggests that industry may view collaborations as outsourcing. This perception presents a challenge to developing collaborations.

These findings of conflicts in culture and flexibility are consistent with the Pew (2001) report examining the role of University – Industry Relationships. As the Pew report argues, "Universities may find they have a mission more consistent with start-ups because of their strong science and technology focus."[12] One industry interviewee in this research suggested that, "for smaller companies without deep pockets, and no R&D departments, there is an opportunity."

While much mutual benefit can be gained via KE, an understanding of the differences between the goals of each player is helpful. The data gathered in this research indicates that industry would like to see increased speed, flexibility and pro-activeness on the part of universities. Additionally, the research confirms existing views of a difference in the goals of industry and of universities in the potential of collaborations. Industry views graduate recruitment and the identification of new business opportunities as the primary goals of its support of university projects. This may contrast with the research goals of universities. The long-term success of collaborations may require better understanding of these differences.

Second and third sector attitudes

The second and third sectors play a defining role in determining policy and funding with respect to KE (the Triple Helix model). As such, a review of external university collaborations would not be complete without understanding the interests of these organisations. However, the findings of this section of the paper are limited in scope as they are based on only five online responses and five interviews with respect to the computer games industry.

Evidence of Varying second and third sector – industry Views

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[12] University – Industry Relationships: Framing the Issues for Academic Research in Agricultural Biotechnology, Proceedings from the November 19-20, 2002 workshop sponsored by the Pew Initiative on Food and Biotechnology, P. 40.

As part of the online survey, both industry and second and third sector were asked some of the same questions. Evidence of divergent views of graduate preparedness and the goals of university-industry KE emerged from the answers. The caveat to this evidence is that the number of industry responses is three times that of second and third sector responses.

When asked to identify how industry-university involvement should assist the computer games industry and universities in the future, the online responses of agencies placed more weight on specific R&D activities than did industry. The following charts show the online responses to how industry-university involvement should assist industry or universities. The responses are shown in descending order of popularity.

Figure 3 shows the top categories as to how agencies feel industry-university collaborations should help *universities*. The emphasis on patents and R&D related categories is apparent.

Figure 3: Second and third sector view of how collaborations should help universities
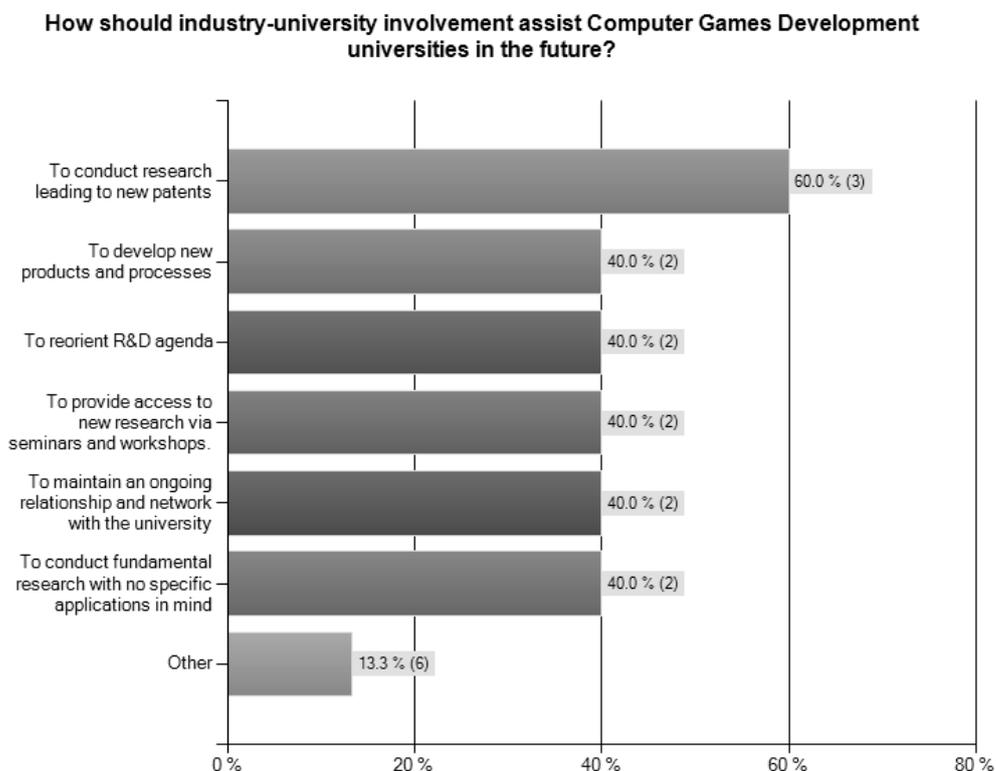
In Figure 4 below, the emphasis on how these collaborations should help *industry* is on graduate recruitment, training and R&D related categories.

Figure 4: Second and third sector view of how collaborations should help industry

How should industry-university involvement assist the Computer Games Development industry in the future?
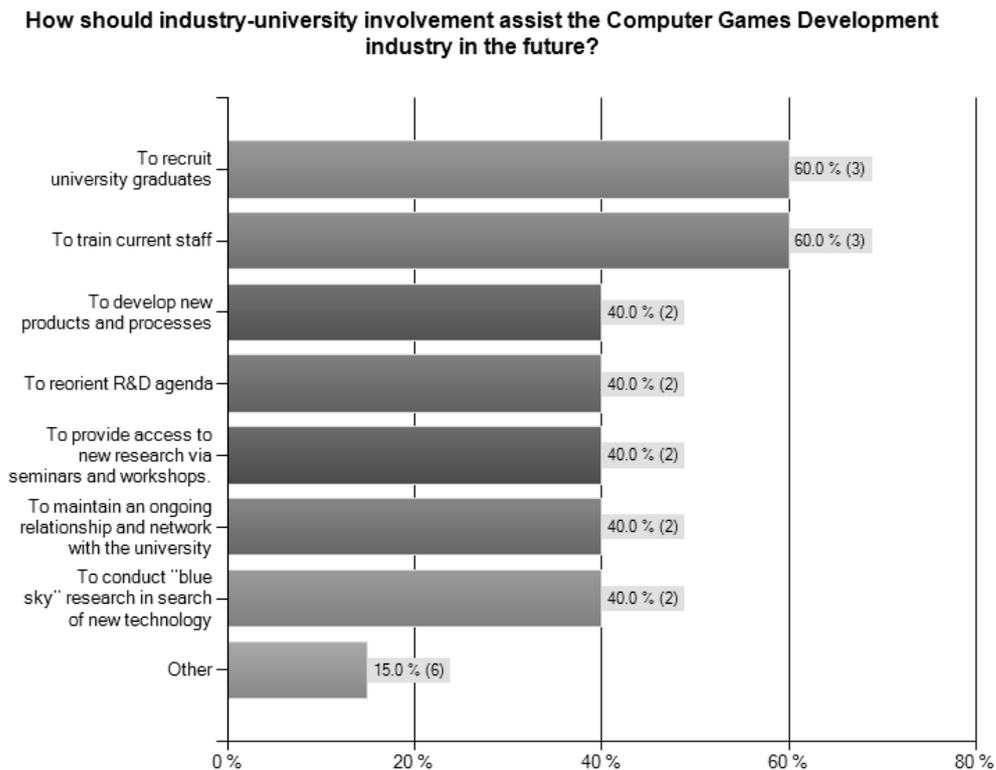
Contrast this with Figure 2 from the industry perspectives earlier in the discussion, where the emphasis was on recruitment, new business opportunities and networking. The lack of "to train staff" as an option and the low ranking of R&D related categories is at odds with the second and third sector's view of the goals of these collaborations.

With issues such as patenting and Continuing Professional Development (CPD) high on the agenda of the second and third sectors, the divergent views between this and the computer games sector requires further investigation. The high ranking of patenting on the second and third sector's part, as seen in Figure 3, could be a reflection of an emphasis on measurable outputs. However, the low ranking of patenting on industry's part could reflect that patents are not a preferred tool for protecting innovations in the computer games industry. Further research should be conducted to establish and analyse the existence of these divergent goals.

Given the relatively small size of the sample included in this research, it is difficult to make conclusive statements regarding second and third sectors. More research is required to adequately address these issues.

Case study: Moving Targets

Moving Targets[13] is a Scottish Funding Council funded KE project led by the University of Abertay Dundee in partnership with University of Edinburgh and Edinburgh College of Art.[14] According to the project's website:

> Moving Targets seeks to create an innovative and sustainable knowledge exchange mechanism, which fulfils the Scottish Creative Media sector's need to respond to the emerging market trends of global consumers by devising and developing new models to engage new audiences. Demand-led by industry, Moving Targets facilitates the flow of knowledge between the key researchers, producers, policy makers and consumers of Creative Media.[15]

The project is ongoing at the time of writing and due to conclude in December 2013; the discussion here presents some preliminary thoughts on the Knowledge Exchange mechanisms developed and employed by the project in collaboration with the digital media industries sector in Scotland. This includes, but is not limited to, the computer games industry discussed earlier.

Moving Targets is structured as an inter-disciplinary project focussing on enabling co-creation, audience engagement and new business models for the digital media industries. Located in Dundee and Edinburgh, the project seeks to collaborate with firms throughout Scotland. The project has engaged with over 100 firms through a mix of secondments, consulting, workshops and consultations. Designed with a flexible structure in mind, the evolution of the project has adapted to the demands of industry as both the economic environment of the digital media industries and KE mechanisms change.

Recognising the dynamic nature of practice and expertise in this sector the project set out to create a knowledge exchange environment that enabled the free flow of expertise around the participants in response to demand from individual or groups of companies. In order to achieve this the project established a new role that combined intelligence gathering through secondments with commercial project partners with delivering solutions through multi-directional knowledge exchange.

Central to the structure has been the role of Knowledge Exchange Associates (KEAs). Akin to the Knowledge Transfers Associates of the Technology Strategy Board's Knowledge

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[13] Following the survey and interviews conducted in late 2009, the authors of this paper were researchers in the Moving Targets project.

[14] The University of Edinburgh and Edinburgh College of Art merged in Summer 2011.

[15] From the About Us section of www.movingtargets.org.uk as of May 2013.

Transfer Partnerships and an academic Research Assistant. KEAs have a broader remit that includes KE, research and audience development. The mobilised KEAs have proven essential to identifying new partners and the direction of the research. As the only actor in the Knowledge exchange environment with a view of all the components the KEAs role is to indent knowledge gaps and solutions that can be located within or introduced to the entire KE network through the workshop programme.

Figure 5: Knowledge Exchange Associate in relation to project stakeholders and multidirectional knowledge exchange.

Intellectual Property Owners

(SMEs & Universities)

Markets

KEA

Audiences
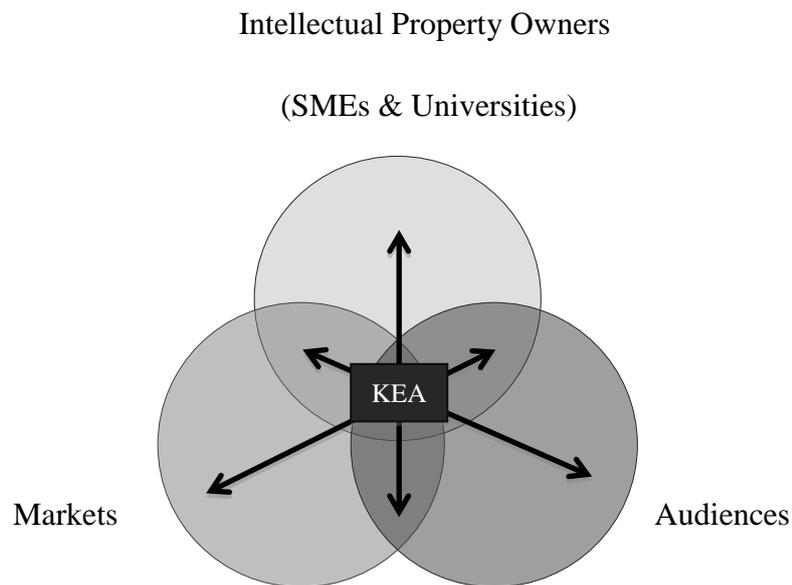
In order to fulfil this role the KEAs must act as an agent of knowledge exchange between the stakeholders and have the flexibility to respond in ways appropriate to the nature of the demand rather than to the operation of the process.

This model for knowledge exchange allows the project to engage with the large number of SMEs that characterises the sector through identifying common challenges through the secondment activities, locating expertise within the KE ecology and disseminating solutions back into the larger group through workshop activities.

Preliminary findings of the interim project review have suggested that flexibility is important for success and engagement with SMEs has specific challenges. The project was set-up purposely to incorporate a high degree of flexibility in terms of the actual mechanisms of engagement. This has proven key as different firms have found placements, workshops, consulting and other mechanisms to be of interest but the project has not found a one-size-

fits-all approach. Furthermore, the timing of these engagements must also be flexible. The three-year length of Moving Targets has allowed for relationships to develop over time and for industry partners to engage when the timing is more conducive to effective KE. This has increased the number of successful collaborations, which have resulted in media content and products that are co-created with audiences,, improved business model understanding for games development companies and an online audience engagement tool.

A second key learning is the specific challenges associated with engaging with SMEs. As noted in Ternouth et al (2012), the absorptive capacity of industry partners is key to successful collaborations. SMEs in the Creative Industries tend to lack this absorptive capacity. It is difficult for a small computer games development firm to devote the time and resources required for successful engagements with universities. These firms are often in a quasi-start-up mode in which time and resources are at a premium. When considering legal agreements from universities, these firms are unlikely to have the in-house legal representation or resources acquire external advice required to clear such agreements. Again, the challenges with engaging with the SME subset of Creative Industries require further flexibility in project design.

As a case study, Moving Targets is inchoate and further findings are likely to emerge as the project draws to a close later in 2013. The findings of the research are in line with the existing body of literature on KE.

Conclusions

Knowledge Exchange in the Creative Industries is a relatively under-researched area in the study of university-industry collaborations. This paper has presented survey and interview evidence examining the perception of these collaborations from practitioners and stakeholders in the computer games industry. The bulk of the paper's findings confirm those of findings in other sectors. The literature has long established that there is no one-size-fits all approach, universities and industry have differing cultures and successful KE requires flexibility. However, the industry structure and economics of the Creative Industries create a unique environment for KE with universities needing to interact with a large number of small firms.

This paper has only briefly touched on a number of other key issues which merit further consideration. This research specifically examines KE in Creative Industries in the computer

games industry but other sub-sectors of Creative Industries are equally under-examined. A more in-depth comparison of the findings of this work with those in other sectors would better highlight the sector effects of KE. The second and third sector analysis of this paper was limited by low response rates but further research could better determine the interaction of these stakeholders on KE. Furthermore, since the bulk of the empirical research was conducted, the KE landscape has shifted its focus to co-creation and open innovation models that are not considered here. More research in these areas would generate a stronger case for the unique characteristics of Knowledge Exchange.

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Appendix 1: Interview Questions

Industry

Suppose I am a young person planning on a career in the games industry, what advice would you give me?

What does your organisation look for in a potential hire?

Could you walk me through the process of becoming a new hire at your company?

What has been your experience with industry-university collaborations and projects?

How can university encourage industry-university collaborations?

What are the types of collaborations with university do you feel would benefit your organisation?

Second and third sector

What are the main drivers of success in the future of the UK computer games development industry?

What do you expect the areas of growth in the computer games development industry to be?

How do you think graduate skills should change to meet the challenges of growth in the computer games development industry?

How would you like to see industry and university developing and expanding their relationship?

What benefits for industry would you like to see as a result of industry-university relationships?

What benefits for university would you like to see as a result of industry-university relationships?