Assessing IS Research Impact

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Assessing IS Research Impact

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Abstract:

Based on the International Conference on Information Systems’ (ICIS) 2013 senior scholars’ forum, this paper shares insights on IS research impact assessment. We define research impact as conducting research that makes a difference to individuals, businesses, industries and societies. While assessment groups like AACSB (the Association to Advance Collegiate Schools of Business) want scholars to make an impact, sometimes they operationalize impact in ways that may encourage scholars to pursue research goals tangential to making a difference. The purpose of this paper is to stimulate thinking in the IS community on creating research assessment techniques that encourage our scholars to make a difference.

Keywords: research impact, assessment, IS field
I. INTRODUCTION

Segments of the public have grown increasingly wary of inaccessible academic research, wondering what the purpose of it is, whether it is worth the cost, and how it helps. In a 2014 *New York Times* article entitled, “Professors, We Need You!” Nicholas Kristof laments the state of academic research. Reflecting on scholars’ inability to predict the Arab Spring, he comments that academic research has grown increasingly arcane and irrelevant [Kristof, 2014]. Referring to IS research specifically, Ginzberg states: “Practitioners do not see IS academics as relevant. They do not turn to us [IS academics] for help with their most significant problems. They do not, in general, read what we write” [Ginzberg, 2012, p. 7].

Public dissatisfaction with academic research combined with rising costs of higher education and reduced government funds are pressuring academics to document how our research benefits society. Already agencies like the United Kingdom’s Treasury are questioning whether universities are using their funding to make an impact. Rather than allowing external stakeholders to dictate a narrow subset of impacts, the purpose of this paper is to define a broad range of potential impacts our scholars can pursue. The paper then suggests actions that will encourage IS scholars to pursue research that makes a difference.

The paper begins by proposing two research assessment techniques and sharing examples of research assessment exercises at the country and industry level. The paper then provides examples of impactful research and concludes with action items for the IS community.

II. HOW CAN WE ASSESS RESEARCH IMPACT?

As we have defined it, research impact means making a difference. Senior scholars proposed two potential models to assess research impact: DeLone and McLean’s IS Success Model [Delone and McLean, 1992] and a research impacts model.

**Adapt DeLone and McLean’s IS Success Model**

DeLone and McLean proposed an IS success model to guide research investigating the impact of IS. This model was a response to system stakeholders wanting to assess the value that their expensive information systems delivered, a problem that the IS field has faced since its inception. DeLone and McLean’s model proposes that
system quality and information quality leads to use and user satisfaction. Use and satisfaction lead to individual impact, which leads in turn to organizational impact. Figure 1 shows an adaptation of the DeLone and McLean model with six similar interrelated measures of information-systems-research publication impact. The model proposes that journal and article quality leads to use of the published ideas and user satisfaction. This use and satisfaction impacts individuals and can then lead to a difference for organizations and society.

Consideration of the model in Figure 1 suggests problems associated with measuring research impact that parallel the problems with measuring system impact. A clear problem is that while stakeholders are generally interested in impacts (i.e., the right side of the model) these impacts are diverse and difficult to assess systematically. Furthermore, there is often a lag between when a paper is published and when the research enters mainstream thinking and makes a difference. These problems draw assessment attention instead to the earlier stages in the model. Unfortunately, article quality (the left side of the model) is also difficult to assess systematically (as anyone who has had to organize a best-paper award can attest) and only a weak predictor of likely impact. Using journal reputation as a proxy for research impact is popular but is an ecological fallacy since the quality of papers within a particular journal vary more than the variation across journals.

Given these problems, most current assessment strategies focus instead on the middle of the model, namely use and user satisfaction, as proxies for the desired impact. Assessing research use requires designing criteria that consider the different groups that use academic research--academics, students and organizations. We can assess academic use with citation count and theory reuse. An article mentioned in a syllabus or textbook shows student use. Practitioners mentioning research findings or articles in feeds, blogs, or reports indicate organizational use.

The model further suggests strategies that IS academics can pursue to improve the impact of our research. First, since students and practitioners may not fully understand our research in the form of research articles, we should encourage synthesis articles, which take findings from a body of research and repackage it in a way that is easy for
people to act upon. This repackaging might include popular press news stories. Second, in many cases research is inaccessible to people who could use it because much scientific research is published in proprietary outlets run by companies who profit from selling our work to our stakeholders.

**Apply a Research Impacts Model**

Given the problems with applying DeLone and McLean's model [1992] to assess IS research impact, another option is to apply a research impacts model (Swanson, forthcoming), as shown in Figure 2. This model broadly describes how academic research, publication and education act together to impact professional practice. Research incorporates all aspects of design, execution, and documentation, except its publication. Publication includes traditional journal publication, conference presentations and Web postings. Education includes incorporating research findings in traditional degree programs, executive education and business-sponsored programs. Each of these academic activities provides multiple opportunities to directly impact professional practice. For instance, researchers might use action research approach to improve a client organizations business practices. Publication might target practitioner journals and periodicals. Education might include a workshop instructing professionals how to use a new method such as business analytics.

![Research Impacts Model](image)

**Figure 2. Research Impacts Model**
In addition to these avenues for direct research effects, Figure 2 recognizes that indirect research effects may occur through the diffusion of both academic and professional practices. Taking academic practice first, in the case of research, a particular form may become popular and spread among research groups, as was well illustrated in research on group decision support in the 1980s. In the case of publication, the traditional citation process underpins and documents the accumulation of effects of each publication on subsequent others that rely upon them. It is here that citation counts have their place. In the case of education, course syllabi, reflecting research findings, are often shared among academics and their institutions. Thus, the extent to which one academic group’s research ultimately affects professional practice depends not only on its direct engagement with professionals, but on the diffusion of this research through academic practices themselves. Greater research diffusion will generate more opportunities for research to come to practitioners’ attention through widespread direct engagement.

Finally, Figure 2 recognizes that research may have additional impact through diffusion effects within professional practice. For instance, a few professionals adopt a new concept, originally introduced in academic research, and then other professionals may adopt the concept, as was the case with critical success factors in its heyday.

Thus, incorporating academic and professional practice, the model moves beyond simplified notions that practitioners will read published research articles to guide their action and instead maps the multiple avenues through which impacts can and do occur. This offers any one IS research unit the opportunity to assess how this presently works in its own case. Because research units may differ in their approaches, so too may their assessments. Consider two simplified cases. One unit engages primarily in action research and can tally up its direct impacts study by study. But do the resulting organizational improvements diffuse more widely, or are they all one-off accomplishments? Are there theoretical contributions that diffuse among other researchers? Another unit engages primarily in economics-based research that makes use of secondary data publically available. It can easily tally up the citations to its work to document its academic diffusion. But does this research come to the attention of practitioners and impact what they think and do, and if so how? In each of these cases, there will be a different story to tell, employing the model. And in doing so neither research approach is considered inherently superior to the other. Rather, the research units are appropriately challenged to speak in their own distinct way to the impacts of their respective work.
III. NATIONAL RESEARCH ASSESSMENT PRACTICES

As the section above shows, both the research impacts model and DeLone and McLean’s IS success model have merit for assessing research impact. Unfortunately neither of these are broadly applied today. One country that is currently applying research assessment methods is the United Kingdom, which has made great strides assessing research impact as a condition for academic institutions receiving quality-related research funding. This section will explain the UK’s Research Excellence Framework’s history, how the framework works and its challenges.

The UK Government funds higher education in many ways. Aside from student funding, it distributes around $2.6bn per annum to universities in “quality-related” research funding in addition to about $5.2bn in peer-reviewed grant funding. Periodically, since 1986, the Higher Education Funding Council (HEFCE) has carried out reviews of research in higher education institutions on behalf of the government. The UK higher education system has developed a range of statistics to: measure its performance, account for public funding, inform management decisions, demonstrate that academic standards are preserved, and satisfy students, employers and others of its quality [Bence and Oppenheim, 2005]. We need to recognize these research reviews, in their various guises, as part of this requirement to demonstrate worth. Over the last 28 years the outcome of the research assessments was a letter, grade, star or a combination of these. This research assessment resulted in heavily skewed research funding going towards institutions earning high scores.

As the title of these reviews has morphed from Research Selectivity to Research Assessment to the current Research Excellence Framework (REF), so their scope has changed. Originally, the government required institutions to put forward five outputs in each of 37 cost centers then, in the next review, peer review panels evaluated two publications per staff member in 152 subject units of assessment [Bence and Oppenheim, 2005, Jump, 2013]. The evaluators also sought information on research student numbers and Research Excellence Framework research income. By 1992, higher education institutions had to submit two publications and two other forms of public output. Four years later, higher education institutions filed up to four publications per academic. By 2001, institutions made 2,600 submissions to 69 units of assessment. In 2008, the government introduced quality profiles and set five quality categories. Explicit criteria assessed applied, practice-based and interdisciplinary research.

For the current research assessment framework, which the government will announce the results of in December 2014, higher education institutions have submitted research from 52,077 academics in 36 units of assessment. This framework marks the first time that an assessment of non-academic impact, accounting for 20% of the overall grade, has been made. This 20% of total score involves an impact statement (20%) and impact cases (80%) which are
assessed by expert panels that consider *reach* and *significance*. These panels contain academics and research *users*. Higher education institutions have to submit around one impact case per ten academics.

Impact, in the assessment exercise, is seen as an effect on a variety of aspects of society, culture and the economy engendered by changes in understanding, values and actions. See Figure 3. As the figure shows, research impact must reach outside academia. The Research Excellence Framework assesses research quality by peer review of publications and submissions about the institution’s research environment. The claimed impact must be based upon published research; good research is necessary but not sufficient to claim impact. The quote below from Thirunamachandran, one of the architects of the current Research Excellence Framework system, that forestalled a UK Treasury demand for a metrics-based system by offering an assessment of impact, shows why impact is important. “The Treasury was interested in the not-unreasonable question of ‘what does £1.6 billion a year in QR funding buy in practical, lay terms, economically, socially and culturally?’ That can only be articulated in terms of impact [Jump, 2013, p. 2].”

For the funding council to consider an impact case it must meet several criteria. First, high quality qualitative or quantitative research published in quality journals form each impact case’s foundation. Consulting work such as disseminating research to companies and giving talks is excluded. Second, impact cases must be three pages long, consisting of a 1.5 page story and 1.5 pages of corroborating evidence. This means a researcher has 1.5 pages to demonstrate how her research, for example, saved Iceland from financial ruin and then the following 1.5 pages will provide success stories and letters as corroborating evidence. Each impact case includes six references and six corroborating pieces of evidence. Some researchers think this is trivial, while other researchers lament that the author has to distinguish him or herself in a page and a half. Each impact cases must address three indicators: meaning, context and relevance.

While UK higher education institutions have extensive experience undergoing research assessments, this is the first time that any have had to provide impact cases. So the expectation is that a variety of practices will emerge and, hopefully, research on the impact cases may reveal much more about the nature and scope of impact.
Impact Challenges

Unfortunately, submitting impact cases to the UK’s Research Excellence Framework challenges academics to work beyond their usual incentive system. Academics now have to uncover impact and build goodwill with research users to document this impact. Several factors contribute to academics’ struggle documenting impact. First, impact causality is difficult to establish and to evidence. Swinnerton-Dyer, who led the funding council and developed the first research assessment exercise in the UK, feels that impact assessment exercises may be “a license for lying,” since the evidence is “uncheckable” (Jump, 2013). For example, conceptualizing specific impacts like policy change is difficult. How do you show the government did something because of an individual piece of research? Even though legislatures may call academics to testify and legislation may cite journal papers, these occurrences typically comprise only a small element of a constellation of stakeholders involved in political change processes. Furthermore, research topics, methods and approaches differ in their ability to generate impact and may skew institutions’ funding, hiring or promotions systems.

The second reason academics struggle documenting impact is that much impact is unexpected and unplanned. For example, a researcher investigating peer-to-peer music sharing did not expect to (1) find that Canadians who downloaded music for free continue to purchase the same volume of music and (2) act as an expert witness in a trial. This finding impacted the music industry’s distributions decisions. A third impact documentation struggle relates to the time-consuming and problematic nature of evidence gathering. Issues arise with goodwill and academic incentive systems. Researchers must rely on goodwill to develop impact cases. Goodwill issues occur with research users, in collaborative research teams and when researchers depart one university and join another. The people who use academic research such as companies hesitate to write impact support cases because of confidentiality issues. In cases where researchers work collaboratively across institutions and countries, disentangling impact attributable to one piece of research or the contribution of one party is difficult. Since the government assesses impact at the university level, universities have to build goodwill with departing faculty members to encourage them to write their impact case.

To further complicate impact assessments, academic incentive systems do not consider impact. Research plans, which are part of academic funding requests, seldom ask researchers to craft a systematic strategy for generating impact, although impact is given more prominence by non-governmental funders. When academics submit their research to journals, reviewers are concerned about implications not impacts. Implications, which journal editors and reviewers require, differ from impact. Furthermore, years can pass before a publication, and the research underpinning it, has an impact and finding impact is unrewarded and unsupported. Universities rarely consider...
research impact in promotion criteria. However, if periodic impact assessment becomes embedded then promotions and hiring systems will change to reflect this. Generating impact requires that academics repackage their work for non-academic audiences by writing blogs and publishing white papers, for example. Unfortunately, this takes time away from publishing papers in academic journals.

Finally, there is the potential for impact assessment to skew the use of different research methods. In the run up to the Research Excellence Framework there was discussion that quantitative research with its greater capacity to permit generalization of research findings offers more scope for generating and reporting impact. An unintended consequence of a move to assess impact might be to engender a retreat from qualitative research.

IV. ASSESSMENT CASE EXAMPLES

Despite the challenges, universities are successfully assessing research impact beyond academia. This section provides examples of impactful research from Birbeck, University of London in the UK and Technische Universität München (hereinafter TUM) University in Germany. Birbeck provides examples of impact cases submitted as part of the UK’s Research Excellence Framework. TUM provides examples of impactful research occurring as part of an automotive industry collaboration.

Research Excellence Framework Cases

Birbeck, University of London’s School of Business, Economics and Informatics comprises four academic departments and contains three Research Excellence Framework units of assessment. These are business and management studies, economics and econometrics, and computer science and informatics. Birbeck is a research-intensive institution in the top 1% globally. Research Excellence Framework funding comprises around 11% of total income with another slightly larger amount deriving from other peer-reviewed research bids. Hence, performing well in the Research Excellence Framework is vital for Birbeck.

Institutions can decide which academics to submit to the assessment and into which panels. Information systems might fit into either business and management studies or computer science and informatics. To prepare for the Research Excellence Framework, Birbeck sought a variety of impact cases from its academics. These cases then went through assessment at the unit, school and research committee levels before submitting them to external assessors. This process identified the strongest cases with the best evidential support. Birbeck worked these cases up further. Through this process, Birbeck pursues the strategy of demonstrating, by the cases, impact of various types upon various stakeholders derived from a variety of research types. This breadth best shows the value of the
unit’s research. Table 1 below outlines examples of the cases submitted across the three units of assessment by dominant impact area.

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<th>IMPACT AREA</th>
<th>EXAMPLE</th>
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<td>Culture</td>
<td>Expert witness in peer-to-peer music sharing trials</td>
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| Economy     | Rescued Iceland by informing the Icelandic Monetary Policy Committee  
              Improved government advice and guidance to firms on product and process innovation  
              Stochastic modelling for complex option pricing and commodity forward curves, and applications in corporate trading and hedging  
              Improving standards of governance in the UK sports industry |
| Environment | Developed an application that reduces the cost of counting bats  
              Participatory cyber physical computing  
              Intelligent constructionist environments |
| Health      | Remotely captured Parkinson’s disease severity – using the web and algorithms  
              Classified protein structures and functions |
| Public policy | Developed UK sports governance codes  
                Effects of committee structure and gender-composition on effectiveness and accountability of monetary policy committees  
                Impact of applied demand analysis on competition policy  
                Regional economic development policies: using lessons from high-tech economies  
                Allowing for model uncertainty and data revisions in central banks’ forecasting and policy analysis |
| Quality of life | Preventing workplace bullying  
                 Life science informatics |
| Society     | Intelligent tools for teachings teenage math |

As the above table illustrates, notable impact cases deal with the economy, the environment and public policy. Birbeck researchers rescued Iceland by being members of the Icelandic Monetary Policy Committee which dealt with Iceland’s financial system crash. The researchers showed the research the IMPC used and how it helped Iceland recover from its financial problems. By developing an app that reduced the cost of bat monitoring by 90%, Birbeck researchers impacted the environment. The researchers measured impact by calculating the cost of monitoring bat populations prior to and after the apps use. The Bat Conservation Society uses the app in the...
indicator bats biodiversity-monitoring program initiated by the United Nations’ convention on biological diversity. In a third example, Birkbeck’s research shaped sports governance codes by devising policy codes for all amateur sports. Governing bodies in the UK now accept this.

Automotive Industry Impact

Technische Universität München (TUM) University in Germany illustrates how industry-university collaboration can create impact. TUM has established a joint-collaboration agreement between two car companies, Audi and BMW, which are located 30km on each side of TUM. This collaboration affects the way TUM constructs its research programs and it creates a feedback loop for impact issues. Figure 4 below shows the engaged scholarship model that guides TUM’s research program.

![Engaged Scholarship Diamond Model](image)

Leveraging the engaged scholarship model to guide industry collaborations, TUM has taken several actions to build impact into its research programs. First, TUM emphasizes an overarching research program. TUM refrains from research in specific area, single project studies or research with the goal of a single publication. Second, TUM
emphasizes teamwork rather than lone ranger research on a personalized data set. Working in teams provides a continuous flow of talent, skills and tools to address the continuous stream of problems that arise in industry collaborations.

Balance is the third way TUM builds impact into its research programs. TUM understands that its programs are reality-driven, its projects are funding-driven and its publications are outlet driven. To deal with the reality that partner organization top management team changes threaten to ruin TUM’s research programs, TUM maintains its industry collaboration as part of a research portfolio. TUM does not design all of its programs around a single industry collaboration and TUM rejects industry funds that do not support its mission. Two actions that foster TUM’s industry collaboration are fostering student involvement and deemphasizing publications. Since businesses receive student interactions better than professor interactions, TUM’s students evangelize innovation benefits to industry partners. Instead of publications, TUM values its partners’ quarterly reports. The quarterly reports dictate their partner’s goals and TUM’s projects.

TUM’s collaborations with automakers have resulted in designing several automotive mobile services platforms. This includes services that tell driver’s where the next restaurant is located or read things to drivers. MACS and AviCos provide two examples. MACS (i.e., Mobile Automotive Cooperative Services) started in 2001 as a research project funded by Germany’s federal government. Aimed at helping drivers recover commuting time, MACS provides services drivers can use while driving. These include personalized news, entertainment and MyOffice, which consists of email, calendar and to do lists. AViCoS (Avatar based Virtual Co-driver System) arose out of TUM’s collaboration with Audi, a German car company north of Munich. Audi lamented that it had invested significantly in its car with little return: drivers did not know how to use its car’s features. For example, running the air conditioner requires understanding three user elements. To address these problems, TUM helped Audi design an avatar that explains the car.

Projects like MACS and AviCos impact academia, society, industry and policy. While academic impacts typically include papers and citations, TUM’s experiences suggests that only some direct impacts culminate in publications, research papers, and citations. Rather, real impact requires studying the direct impact of a university on the industry over time with multiple publications. TUM’s collaborations have resulted in several direct impacts. Policy impacts include new and better regulations and policy advisory. For example, most human computer interaction research is built for regulation. Human computer interacation research can investigate how to keep the car on the road without the innovation (e.g., radio, navigation, office tasks,) hurting others. Societal impacts include actor perception changes (e.g., academics, practitioners, suppliers and customers) over time regarding the role of platforms and
prototypes. Industry impacts include new product features, new implementation processes, new suppliers (e.g., startups, spinoffs and business units) and new ecosystems (e.g., standardization, transindustry-associations). Unfortunately, many of these impacts are difficult to measure and attribute to academia. For example, when automakers introduce new product features society recognizes the people who market the innovation to the public rather than academic researchers.

V. ACTION ITEMS

The impact TUM has had on the automotive industry and Birbeck University’s experience submitting to the UK’s Research Excellence Framework provide examples of generating and documenting research impact. These examples and the preceding discussion offer several actions the IS community needs to consider as we assess our scholars’ impact. These action require cross-discipline integration, research promotion, resource incentive alignment, impact mindfulness, and help from others.

Action 1: We need better mechanisms to recognize within our own community new knowledge created in the field.

We would argue that our field produces a significant amount of new and practical knowledge, even if much is presented in technical language that is opaque to practitioners. Most of us (perhaps all of us) are hardly aware of the full range and detail of just what is produced in IS research. Too often content about the value of IS (from economics-oriented literature) is invisible to the design science builders, while the new techniques, approaches, models, and evaluation techniques are not foremost in the mind of our behaviorists. We do not excel at informing our colleagues within and outside the IS domain about the full range of potentially impactful new knowledge that we create. While competition may stimulate healthy and energetic activities, it can also keep us from collaborating as effectively as possible in valuing and promoting the collective work of IS researchers. Specialization may be necessary to grasp the full range of content within a narrow domain, but we might need to view our own field more broadly to achieve synergies from the diversity that we already exhibit. It may be worth thinking about mechanisms in our literature (perhaps something akin to an abstracting service akin to the one page summaries of articles at the beginning of MIS Quarterly but across venues) and during conferences to provide celebration and recognition for the new knowledge created in the field, perhaps for successful research streams as well as for individual projects and papers.
Action 2: IS research outcomes, results, theories, and lessons need to be better packaged and promoted.

It is axiomatic that even the most insightful research will have little impact if it is not disseminated. As a field, we have an interest in moving our findings and accumulated knowledge into the broader practitioner domain. However, it is one thing for a community to have responsibilities and opportunities and another to exploit these. For the most part we act as individuals conducting and communicating about our own research. To some extent we each might take some responsibility to package and promote this work through both teaching channels (e.g. adding to our courses and curriculum) and community channels (e.g. presenting at practitioner events such as SIM meetings and discussing informally with practitioners). However, such efforts tend to be idiosyncratic (we are not all very good at this) and difficult to accumulate into a format that highlights its diversity, penetration, and collective influence. We would argue it is still worth doing.

On the other hand, we also need to explore institutional channels for the packaging and promotion of our collective accumulation of knowledge. This might include continued investigation and filling of gaps from research study to practitioner awareness. This might include greater efforts for summarizing and packaging results through publications like *MIS Quarterly Executive*. We might also write systematic columns or articles in purely practitioner outlets such as *CIO magazine* and even *Computerworld*. We could further disseminate our research by contributing to emerging electronic media with blogs, social network pages and other broadcasting. Initiatives might include journal editors writing editorials reflecting on the research impact of a research stream and using digital design methods like Reddit, TedTalks and YouTube to promote our research. Incentives for such work might include expanding the range of valued research at “top” institutions where such work may be currently modestly valued and recognition and encouragement of such work by organizations representing the community such as AIS and the senior scholars, to supplement the benefits for those whose institutions already recognize and reward this type of work.

Action 3: Better align resources and incentives with impactful research

To the extent that impact is embedded in or exhibited by individual work, both scholarly associations and universities need to develop resources and incentive systems that recognize researchers for the effort and delivery of impactful research. This alignment requires recognizing impact when we look for it. Institutions, especially the Association for Information Systems (AIS) and related groups such as the Academy of Management, ACM, and the like, could originate tools that recognize and measure research impact. As individual schools and scholars develop such tools, these institutions could have a hand in promoting these for internal use amongst ourselves as well as among funding.
agencies and regulators such as AACSB. If you follow the argument that such funding and accreditation agencies will eventually enact these tools, it is worth our while to be involved in and possibly lead the way developing intelligent measures rather than accepting whatever anomalous, inconsistent, and “tangible, immediate only” measures these groups propose.

**Action 4: Build more potential for impact into all our research projects**

Much of our research is about understanding the interaction of people, processes, and technology, rather than aimed at solving immediate business problems. This however, does not exclude the potential for seeing how (perhaps with additional knowledge that is known to be missing) can be applied. For example, fundamental knowledge about the diffusion of technology and reactions of people to particular categories of features can provide insight to building particular interfaces. The scholars of such fundamental knowledge may not be held to this second phase in application, but the statement of such a linkage may in itself create impact value. It can do this by showing the way for others to create such application knowledge. By the same token, we can create reward and prestige for those who generate this application-oriented knowledge. Applying results from prior studies in new situations and testing their value when instantiated serves as a valuable link between “pure” or fundamental research and practical significance. We cannot expect scholars to undertake such studies if they are unpublishable or if they are treated as secondary and unimportant.

**Action 5: Focus more on research units and streams and their diverse impacts.**

The IS field may face danger from misplaced evaluation. We tend to evaluate the lowest level unit (e.g. the individual worker) under the hidden assumption that the outcomes of the group are the sum of contributions of each individual. It is arguable if there is value in such evaluation (e.g. to the positive it may stimulate some individuals to higher levels or particular types of performance) but it is clear if we want an assembly line to function effectively it requires a level of organization beyond the individual performance of each employee. We must keep in mind techniques for allocating the benefits of research streams, research communities, and the IS field overall if we do want to show how individual work has value as part of a larger pattern in addition to its unique effects. Both AACSB in the US and the Funding Councils in the UK, require that individuals demonstrate the effects of journal articles, so we cannot ignore the individual study level of performance evaluation. AACSB is particularly interested in top journal publications whereas academic impact in the UK is necessary but not sufficient. UK academics have to show how their research impacts individuals, governments and society. The research assessment techniques that we propose should consider both direct and indirect impacts like impact in the classroom and curriculum, in
conjunction with other studies to formulate and test larger units of knowledge, and in the laboratory, in terms of reflecting how we perform research and evaluate new understanding.

**Action 6: Let others help us.**

Research impact assessment spans beyond the IS community. Others in many of our universities are engaged in the struggle for good processes and measures. Our field needs to leverage these opportunities. For example, all schools in Birkbeck and many in other UK institutions now employ ‘Impact Managers’ who assist academics in ensuring that their research has impact and that the evidence of that impact is systematically collated. Funders are now requiring impact plans and institutions are devoting financial resources to impact.

**Lesson 7: Undertake more joint activities with practitioner organizations**

Having former or current Ph.D students work in industry can help extend the impact of our research. Some strategies may be executive doctoral programs and placing Ph.D.’s in industry collaborations. The executives that executive doctoral programs cater to can take the frameworks and theories introduced in class and implement them in the workplace. TUM’s industry collaborations with Audi and BMW provide an example of how Ph.D. students can begin a research project during their Ph.D. program and then work on implementing the project as an employee. This project implementation may move beyond academic ideas and impact industry.

**VI. CONCLUSION**

As IS academics we want our research to make a difference and positively impact individuals, industry and society. Yet, increasingly, our stakeholders (i.e., funding agencies, governments, accreditation agencies and taxpayers) want proof that the millions of dollars they provide are funding relevant research. This paper has shared some ideas on how the IS field can assess the impact of our research.

As a field, we need to self-regulate and develop assessment techniques rather than allowing stakeholders to impose assessment on us. An article entitled, “Measuring Faculty Impact,” in the September/October issues of BizEd shows the momentum impact measurement is gaining [Shinn, 2014]. By proposing our own assessment techniques, we can highlight the difference IS research makes and hopefully avoid diverting precious time to non-value added tasks. It is our contention that even if you believe that our field’s impact is already sufficient or at least equivalent to other fields (for example do we ask art history to have an impact on society?), it is difficult to argue that we aren’t all better off with more impact and better communication about the impact that we do have.
We hope this panel write-up stirs scholarly debate on assessing research impact and leads the IS field to continuously reflect on the contributions we have made. We are confident that the field is generating useful and impactful work; we are certain that it can and likely will be doing more in the future.

REFERENCES


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Kevin Crowston is a Distinguished Professor of Information Science in the School of Information Studies at Syracuse University. His research examines new ways of organizing made possible by the extensive use of information and communications technology. Specific research topics include the development practices of Free/Libre Open Source Software teams and work practices and technology support for citizen science research projects, both with past NSF support. He is co-editor-in-chief of the journal Information, Technology & People, Chair of the Organizational Communications and Information Systems Division of the Academy of Management and Vice Chair of the International Federation for Information Processing (IFIP) Working Group 8.2 on Information Systems and Organizations. He is presently serving as a program director for the Cyber-Human Systems program at the US National Science Foundation in the Division of Information and Intelligent Systems in the Directorate for Computer and Information Science and Engineering.

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Helmut Krcmar is currently serving as the President-elect of AIS and will then serve as its 20th President. Prof. Dr. Krcmar serves as Dean Faculty Computer Science and Professor of Information Systems with a joint appointment to the Business School at Technische Universität München (TUM). He serves as Scientific Director of Information Management at fortiss GmbH, an applied research Institute for Software, Systems, and Services. He serves as a Member of the Supervisory Board at IMC Information Multimedia Communication AG since 2007, on the data security and privacy board at Deutsche Bahn und is president of the german nationa E-Government Competence Center (NEGZ). He is broadly published in the IS field, especially regarding Information Management and has long served as an advocate of research that matters in support of IS practice. He will therefore focus on the subjects of collaboration between German universities and the surrounding business and technical ecosystems as well as the need for diversity in research approaches.
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Assessing IS Research Impact

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Abstract:

Based on the *International Conference on Information Systems*’ (ICIS) 2013 senior scholars’ forum, this paper shares insights on IS research impact assessment. We define research impact as conducting research that makes a difference to individuals, businesses, industries and societies. While assessment groups like AACSB (the Association to Advance Collegiate Schools of Business) want scholars to make an impact, sometimes they operationalize impact in ways that may encourage scholars to pursue research goals tangential to making a difference. The purpose of this paper is to stimulate thinking in the IS community on creating research assessment techniques that encourage our scholars to make a difference.

**Keywords:** research impact, assessment, IS field

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I. INTRODUCTION

Segments of the public have grown increasingly wary of inaccessible academic research, wondering what the purpose of it is, whether it is worth the cost, and how it helps. In a 2014 New York Times article entitled, “Professors, We Need You!” Nicholas Kristof laments the state of academic research. Reflecting on scholars’ inability to predict the Arab Spring, he comments that academic research has grown increasingly arcane and irrelevant [Kristof, 2014]. Referring to IS research specifically, Ginzberg states: “Practitioners do not see IS academics as relevant. They do not turn to us [IS academics] for help with their most significant problems. They do not, in general, read what we write” [Ginzberg, 2012, p. 7].

Public dissatisfaction with academic research combined with rising costs of higher education and reduced government funds are pressuring academics to document how our research benefits society. Already agencies like the United Kingdom’s Treasury are questioning whether universities are using their funding to make an impact. Rather than allowing external stakeholders to dictate a narrow subset of impacts, the purpose of this paper is to define a broad range of potential impacts our scholars can pursue. The paper then suggests actions that will encourage IS scholars to pursue research that makes a difference.

The paper begins by proposing two research assessment models and sharing examples of research assessment exercises at the country and industry level. The paper then provides examples of impactful research and concludes with action items for the IS community.

II. HOW CAN WE ASSESS RESEARCH IMPACT?

As we have defined it, research impact means making a difference. Senior scholars proposed two potential models to assess research impact: DeLone and McLean’s IS Success Model [Delone and McLean, 1992] and a research impacts model.

Adapt DeLone and McLean’s IS Success Model

DeLone and McLean proposed an IS success model to guide research investigating the impact of IS. This model was a response to system stakeholders wanting to assess the value that their expensive information systems delivered, a problem that the IS field has faced since its inception, DeLone and McLean’s model proposes that system quality and information quality leads to use and user satisfaction. Use and satisfaction lead to individual impact, which leads in turn to organizational impact. Error! Reference source not found. shows an adaptation of the DeLone and McLean model with six similar interrelated measures of information-systems-research publication impact. The model proposes that journal and article quality leads to use of the published ideas and user satisfaction. This use and satisfaction impacts individuals and can then lead to a difference for organizations and society.

Consideration of the model in Figure 1 suggests problems associated with measuring research impact that parallel the problems with measuring system impact. A clear problem is that while stakeholders are generally interested in impacts (i.e., the right side of the model) these impacts are diverse and difficult to assess systematically. Furthermore, there is often a lag between when a paper is published and when the research enters mainstream thinking and makes a difference. These problems draw assessment attention instead to the earlier stages in the model. Unfortunately, article quality (the left side of the model) is also difficult to assess systematically (as anyone who has had to organize a best-paper award can attest) and only a weak predictor of likely impact. Using journal reputation as a proxy for research impact is popular but is an ecological fallacy since the quality of papers within a particular journal vary more than the variation across journals.
Given these problems, most current assessment strategies focus instead on the middle of the model, namely use and user satisfaction, as proxies for the desired impact. Assessing research use requires designing criteria that consider the different groups that use academic research—academics, students and organizations. We can assess academic use with citation count and theory reuse. An article mentioned in a syllabus or textbook shows student use. Practitioners mentioning research findings or articles in feeds, blogs, or reports indicate organizational use.

The model further suggests strategies that IS academics can pursue to improve the impact of our research. First, since students and practitioners may not fully understand our research in the form of research articles, we should encourage synthesis articles, which take findings from a body of research and repackage it in a way that is easy for people to act upon. This repackaging might include popular press news stories. Second, in many cases research is inaccessible to people who could use it because much scientific research is published in proprietary outlets run by companies who profit from selling our work to our stakeholders.

Apply a Research Impacts Model

Given the problems with applying DeLone and McLean’s model [1992] to assess IS research impact, another option is to apply a research impacts model (Swanson, forthcoming), as shown in Figure 2. This model broadly describes how academic research, publication and education act together to impact professional practice. Research incorporates all aspects of design, execution, and documentation, except its publication. Publication includes traditional journal publication, conference presentations and Web postings. Education includes incorporating research findings in traditional degree programs, executive education and business-sponsored programs. Each of these academic activities provides multiple opportunities to directly impact professional practice. For instance, researchers might use action research approach to improve a client organizations business practices. Publication might target practitioner journals and periodicals. Education might include a workshop instructing professionals how to use a new method such as business analytics.

In addition to these avenues for direct research effects, Figure 2 recognizes that indirect research effects may occur through the diffusion of both academic and professional practices. Taking academic practice first, in the case of research, a particular form may become popular and spread among research groups, as was well illustrated in research on group decision support in the 1980s. In the case of publication, the traditional citation process underpins and documents the accumulation of effects from each publication on subsequent others that rely upon them. It is here that citation counts have their place. In the case of education, course syllabi, reflecting research findings, are often shared among academics and their institutions. Thus, the extent to which one academic group’s research ultimately affects professional practice depends not only on its direct engagement with professionals, but on the diffusion of this research through academic practices themselves. Greater research diffusion will generate more opportunities for research to come to practitioners’ attention through widespread direct engagement.
Finally, Figure 2 recognizes that research may have additional impact through diffusion effects within professional practice. For instance, a few professionals adopt a new concept, originally introduced in academic research, and then other professionals may adopt the concept, as was the case with critical success factors in its heyday.

Thus, incorporating academic and professional practice, the model moves beyond simplified notions that practitioners will read published research articles to guide their action and instead maps the multiple avenues through which impacts can and do occur. This offers any one IS research unit the opportunity to assess how this presently works in its own case. Because research units may differ in their approaches, so too may their assessments. Consider two simplified cases. One unit engages primarily in action research and can tally up its direct impacts study by study. But do the resulting organizational improvements diffuse more widely, or are they all one-off accomplishments? Are there theoretical contributions that diffuse among other researchers? Another unit engages primarily in economics-based research that makes use of secondary data publically available. It can easily tally up the citations to its work to document its academic diffusion. But does this research come to the attention of practitioners and impact what they think and do, and if so how? In each of these cases, there will be a different story to tell, employing the model. And in doing so neither research approach is considered inherently superior to the other. Rather, the research units are appropriately challenged to speak in their own distinct way to the impacts of their respective work.

It is one thing to present models for assessing research, it is another to observe instances where efforts to assess research have begun. Below we present first a discussion of the United Kingdom’s Research Excellence Framework’s history, how the framework works and its challenges. This will be followed by examples of efforts to generate impactful research at the Birkbeck, University of London’s School of Business, Economics and Informatics and the Technische Universität München in Germany.

III. NATIONAL RESEARCH ASSESSMENT PRACTICES

The UK Government funds higher education in many ways. Aside from student funding, it distributes around $2.6bn per annum to universities in “quality-related” research funding in addition to about $5.2bn in peer-reviewed grant funding. Periodically, since 1986, the Higher Education Funding Council (HEFCE) has carried out reviews of research in higher education institutions on behalf of the government. The UK higher education system has developed a range of statistics to: measure its performance, account for public funding, inform management decisions, demonstrate that academic standards are preserved, and satisfy students, employers and others of its quality [Bence and Oppenheim, 2005]. We need to recognize these research reviews, in their various guises, as part of this requirement to demonstrate worth. Over the last 28 years the outcome of the research assessments was a letter, grade, star or a combination of these. This research assessment resulted in heavily skewed research funding going towards institutions earning high scores.

As the title of these reviews has morphed from Research Selectivity to Research Assessment to the current Research Excellence Framework (REF), so their scope has changed. Originally, the government required institutions to put forward five outputs in each of 37 cost centers then, in the next review, peer review panels evaluated two publications per staff member in 152 subject units of assessment [Bence and Oppenheim, 2005, Jump, 2013]. The evaluators also sought information on research student numbers and Research Excellence Framework research income. By 1992, higher education institutions had to submit two publications and two other forms of public output. Four years later, higher education institutions filed up to four publications per academic. By 2001, institutions made 2,600 submissions to 69 units of assessment. In 2008, the government introduced quality profiles and set five quality categories. Explicit criteria assessed applied, practice-based and interdisciplinary research.

For the current research assessment framework, which the government will announce the results of in December 2014, higher education institutions have submitted research from 52,077 academics in 36 units of assessment. This framework marks the first time that an assessment of non-academic impact, accounting for 20% of the overall grade, has been made. This 20% of total score involves an impact statement (20%) and impact cases (80%) which are assessed by expert panels that consider reach and significance. These panels contain academics and research users. Higher education institutions have to submit around one impact case per ten academics.

Impact, in the assessment exercise, is seen as an effect on a variety of aspects of society, culture and the economy engendered by changes in understanding, values and actions. See Error! Reference source not found. As the figure shows, research impact must reach outside academia. The Research Excellence Framework assesses research quality by peer review of publications and submissions about the institution’s research environment. The claimed impact must be based upon published research; good research is necessary but not sufficient to claim impact. The quote below from Thirunamachandran, one of the architects of the current Research Excellence Framework system, that forestalled a UK Treasury demand for a metrics-based system by offering an assessment of impact, shows why impact is important. “The Treasury was interested in the not-unreasonable question of what
For Review Only

Volume xx  Article x

Does £1.6 billion a year in QR funding buy in practical, lay terms, economically, socially and culturally? That can only be articulated in terms of impact [Jump, 2013, p. 2].”

Figure 3. UK’s Research Excellence Framework

For the funding council to consider an impact case it must meet several criteria. First, high quality qualitative or quantitative research published in quality journals form each impact case’s foundation. Consulting work such as disseminating research to companies and giving talks is excluded. Second, impact cases must be three pages long, consisting of a 1.5 page story and 1.5 pages of corroborating evidence. This means a researcher has 1.5 pages to demonstrate how her research, for example, saved Iceland from financial ruin and then the following 1.5 pages will provide success stories and letters as corroborating evidence. Each impact case includes six references and six corroborating pieces of evidence. Some researchers think this is trivial, while other researchers lament that the author has to distinguish him or herself in a page and a half. Each impact cases must address three indicators: meaning, context and relevance.

While UK higher education institutions have extensive experience undergoing research assessments, this is the first time that any have had to provide impact cases. So the expectation is that a variety of practices will emerge and, hopefully, research on the impact cases may reveal much more about the nature and scope of impact.

Impact Challenges

Unfortunately, submitting impact cases to the UK’s Research Excellence Framework challenges academics to work beyond their usual incentive system. Academics now have to uncover impact and build goodwill with research users to document this impact. Several factors contribute to academics’ struggle documenting impact. First, impact causality is difficult to establish and to evidence. Swinnerton-Dyer, who led the funding council and developed the first research assessment exercise in the UK, feels that impact assessment exercises may be "a license for lying," since the evidence is "uncheckable"(Jump, 2013). For example, conceptualizing specific impacts like policy change is difficult. How do you show the government did something because of an individual piece of research? Even though legislatures may call academics to testify and legislation may cite journal papers, these occurrences typically comprise only a small element of a constellation of stakeholders involved in political change processes. Furthermore, research topics, methods and approaches differ in their ability to generate impact and may skew institutions’ funding, hiring or promotions systems.

The second reason academics struggle documenting impact is that much impact is unexpected and unplanned. For example, a researcher investigating peer-to-peer music sharing did not expect to (1) find that Canadians who downloaded music for free continue to purchase the same volume of music and (2) act as an expert witness in a trial. This finding impacted the music industry's distributions decisions. A third impact documentation struggle relates to the time-consuming and problematic nature of evidence gathering. Issues arise with goodwill and academic incentive systems. Researchers must rely on goodwill to develop impact cases. Goodwill issues occur with research users, in collaborative research teams and when researchers depart one university and join another. The people who use academic research such as companies hesitate to write impact support cases because of confidentiality issues. In cases where researchers work collaboratively across institutions and countries, disentangling impact attributable to one piece of research or the contribution of one party is difficult. Since the government assesses impact at the university level, universities have to build goodwill with departing faculty members to encourage them to write their impact case.

To further complicate impact assessments, academic incentive systems do not consider impact. Research plans, which are part of academic funding requests, seldom ask researchers to craft a systematic strategy for generating impact, although impact is given more prominence by non-governmental funders. When academics submit their research to journals, reviewers are concerned about implications not impacts. Implications, which journal editors and reviewers require, differ from impact. Furthermore, years can pass before a publication, and the research underpinning it, has an impact and finding impact is unrewarded and unsupported. Universities rarely consider research impact in promotion criteria. However, if periodic impact assessment becomes embedded then promotions and hiring systems will change to reflect this. Generating impact requires that academics repackage their work for non-academic audiences by writing blogs and publishing white papers, for example. Unfortunately, this takes time away from publishing papers in academic journals.
Finally, there is the potential for impact assessment to skew the use of different research methods. In the run up to the Research Excellence Framework there was discussion that quantitative research with its greater capacity to permit generalization of research findings offers more scope for generating and reporting impact. An unintended consequence of a move to assess impact might be to engender a retreat from qualitative research.

IV. ASSESSMENT CASE EXAMPLES

Despite these challenges, universities are successfully assessing research impact beyond academia. This section provides examples of impactful research from Birbeck, University of London in the UK and Technische Universität München (hereinafter TUM) University in Germany. Birbeck provides examples of impact cases submitted as part of the UK’s Research Excellence Framework. TUM provides examples of impactful research occurring as part of an automotive industry collaboration.

Research Excellence Framework Cases

Birkbeck, University of London’s School of Business, Economics and Informatics comprises four academic departments and contains three Research Excellence Framework units of assessment. These are business and management studies, economics and econometrics, and computer science and informatics. Birkbeck is a research-intensive institution in the top 1% globally. Research Excellence Framework funding comprises around 11% of total income with another slightly larger amount deriving from other peer-reviewed research bids. Hence, performing well in the Research Excellence Framework is vital for Birkbeck.

<table>
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<tr>
<th>IMPACT AREA</th>
<th>EXAMPLE</th>
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<tbody>
<tr>
<td>Culture</td>
<td>Expert witness in peer-to-peer music sharing trials</td>
</tr>
<tr>
<td>Economy</td>
<td>Rescued Iceland by informing the Icelandic Monetary Policy Committee</td>
</tr>
<tr>
<td></td>
<td>Improved government advice and guidance to firms on product and process innovation</td>
</tr>
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<td></td>
<td>Stochastic modelling for complex option pricing and commodity forward curves, and applications in corporate trading and hedging</td>
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<tr>
<td></td>
<td>Improving standards of governance in the UK sports industry</td>
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<tr>
<td>Environment</td>
<td>Developed an application that reduces the cost of counting bats</td>
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<td></td>
<td>Participatory cyber physical computing</td>
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<td>Intelligent constructionist environments</td>
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<tr>
<td>Health</td>
<td>Remotely captured Parkinson’s disease severity – using the web and algorithms</td>
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<td></td>
<td>Classified protein structures and functions</td>
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<td>Public policy</td>
<td>Developed UK sports governance codes</td>
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<td>Effects of committee structure and gender-composition on effectiveness and accountability of monetary policy committees</td>
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<td>Impact of applied demand analysis on competition policy</td>
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<td>Regional economic development policies: using lessons from high-tech economies</td>
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<td>Allowing for model uncertainty and data revisions in central banks’ forecasting and policy analysis</td>
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<td>Quality of life</td>
<td>Preventing workplace bullying</td>
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<td>Life science informatics</td>
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<td>Society</td>
<td>Intelligent tools for teachings teenage math</td>
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Institutions can decide which academics to submit to the assessment and into which panels. Information systems might fit into either business and management studies or computer science and informatics. To prepare for the Research Excellence Framework, Birbeck sought a variety of impact cases from its academics. These cases then went through assessment at the unit, school and research committee levels before submitting them to external assessors. This process identified the strongest cases with the best evidential support. Birbeck worked these cases
up further. Through this process, Birbeck pursues the strategy of demonstrating, by the cases, impact of various types upon various stakeholders derived from a variety of research types. This breadth best shows the value of the unit’s research. Table 1 below outlines examples of the cases submitted across the three units of assessment by dominant impact area.

As the above table illustrates, notable impact cases deal with the economy, the environment and public policy. Birbeck researchers rescued Iceland by being members of the Icelandic Monetary Policy Committee which dealt with Iceland’s financial system crash. The researchers showed the research the IMPC used and how it helped Iceland recover from its financial problems. By developing an app that reduced the cost of bat monitoring by 90%, Birbeck researchers impacted the environment. The researchers measured impact by calculating the cost of monitoring bat populations prior to and after the app’s use. The Bat Conservation Society uses the app in the indicator bats biodiversity-monitoring program initiated by the United Nations’ convention on biological diversity. In a third example, Birkbeck’s research shaped sports governance codes by devising policy codes for all amateur sports. Governing bodies in the UK now accept this.

**Automotive Industry Impact**

Technische Universität München (TUM) University in Germany illustrates how industry-university collaboration can create impact. TUM has established a joint-collaboration agreement between two car companies, Audi and BMW, which are located 30km on each side of TUM. This collaboration affects the way TUM constructs its research programs and it creates a feedback loop for impact issues. Figure 4 below shows the engaged scholarship model that guides TUM’s research program.

![Engaged Scholarship Diamond Model](image)

Leveraging the engaged scholarship model to guide industry collaborations, TUM has taken several actions to build impact into its research programs. First, TUM emphasizes an overarching research program. TUM refrains from research in specific area, single project studies or research with the goal of a single publication. Second, TUM emphasizes teamwork rather than lone ranger research on a personalized data set. Working in teams provides a continuous flow of talent, skills and tools to address the continuous stream of problems that arise in industry collaborations.
Balance is the third way TUM builds impact into its research programs. TUM understands that its programs are reality-driven, its projects are funding-driven and its publications are outlet driven. To deal with the reality that partner organization top management team changes threaten to ruin TUM’s research programs, TUM maintains its industry collaboration as part of a research portfolio. TUM does not design all of its programs around a single industry collaboration and TUM rejects industry funds that do not support its mission. Two actions that foster TUM’s industry collaboration are fostering student involvement and deemphasizing publications. Since businesses receive student interactions better than professor interactions, TUM’s students evangelize innovation benefits to industry partners. Instead of publications, TUM values its partners’ quarterly reports. The quarterly reports dictate their TUM’s collaborations with automakers have resulted in designing several automotive mobile services platforms. This includes services that tell driver’s where the next restaurant is located or read things to drivers. MACS and AviCos provide two examples. MACS (i.e., Mobile Automotive Cooperative Services) started in 2001 as a research project funded by Germany’s federal government. Aimed at helping drivers recover commuting time, MACS provides services drivers can use while driving. These include personalized news, entertainment and MyOffice, which consists of email, calendar and to do lists. AViCoS (Avatar based Virtual Co-driver System) arose out of TUM’s collaboration with Audi, a German car company north of Munich. Audi lamented that it had invested significantly in its car with little return: drivers did not know how to use its car’s features. For example, running the air conditioner requires understanding three user elements. To address these problems, TUM helped Audi design an avatar that explains the car partner’s goals and TUM’s projects.

Projects like MACS and AviCos impact academia, society, industry and policy. While academic impacts typically include papers and citations, TUM’s experiences suggests that only some direct impacts culminate in publications, research papers, and citations. Rather, real impact requires studying the direct impact of a university on the industry over time with multiple publications. TUM’s collaborations have resulted in several direct impacts. Policy impacts include new and better regulations and policy advisory. For example, most human computer interaction research is built for regulation. Human computer interacation research can investigate how to keep the car on the road without the innovation (e.g., radio, navigation, office tasks.) hurting others. Societal impacts include actor perception changes (e.g., academics, practitioners, suppliers and customers) over time regarding the role of platforms and prototypes. Industry impacts include new product features, new implementation processes, new suppliers (e.g., startups, spinoffs and business units) and new ecosystems (e.g., standardization, transindustry-associations). Unfortunately, many of these impacts are difficult to measure and attribute to academia. For example, when automakers introduce new product features society recognizes the people who market the innovation to the public rather than academic researchers.

V. ACTION ITEMS
The impact TUM has had on the automotive industry and Birbeck University’s experience submitting to the UK’s Research Excellence Framework provide examples of generating and documenting research impact. These examples and the preceding discussion offer several actions the IS community needs to consider as we assess our scholars’ impact. These actions require cross-discipline integration, research promotion, resource incentive alignment, impact mindfulness, and help from others.

Action 1: We need better mechanisms to recognize within our own community new knowledge created in the field.
We would argue that our field produces a significant amount of new and practical knowledge, even if much is presented in technical language that is opaque to practitioners. Most of us (perhaps all of us) are hardly aware of the full range and detail of just what is produced in IS research. Too often content about the value of IS (from economics-oriented literature) is invisible to the design science builders, while the new techniques, approaches, models, and evaluation techniques are not foremost in the mind of our behaviorists. We do not excel at informing our colleagues within and outside the IS domain about the full range of potentially impactful new knowledge that we create. While competition may stimulate healthy and energetic activities, it can also keep us from collaborating as effectively as possible in valuing and promoting the collective work of IS researchers. Specialization may be necessary to grasp the full range of content within a narrow domain, but we might need to view our own field more broadly to achieve synergies from the diversity that we already exhibit. It may be worth thinking about mechanisms in our literature (perhaps something akin to an abstracting service akin to the one page summaries of articles at the beginning of MIS Quarterly but across venues) and during conferences to provide celebration and recognition for the new knowledge created in the field, perhaps for successful research streams as well as for individual projects and papers.
Action 2: IS research outcomes, results, theories, and lessons need to be better packaged and promoted.

It is axiomatic that even the most insightful research will have little impact if it is not disseminated. As a field, we have an interest in moving our findings and accumulated knowledge into the broader practitioner domain. However, it is one thing for a community to have responsibilities and opportunities and another to exploit these. For the most part we act as individuals conducting and communicating about our own research. To some extent we each might take some responsibility to package and promote this work through both teaching channels (e.g. adding to our courses and curriculum) and community channels (e.g. presenting at practitioner events such as SIM meetings and discussing informally with practitioners). However, such efforts tend to be idiosyncratic (we are not all very good at this) and difficult to accumulate into a format that highlights its diversity, penetration, and collective influence. We would argue it is still worth doing.

On the other hand, we also need to explore institutional channels for the packaging and promotion of our collective accumulation of knowledge. This might include continued investigation and filling of gaps from research study to practitioner awareness. This might include greater efforts for summarizing and packaging results through publications like MIS Quarterly Executive. We might also write systematic columns or articles in purely practitioner outlets such as CIO magazine and even Computerworld. Additional sources outside the IS domain may include publication in Harvard Business Review, California Business Review, ACM and IEEE outlets, CIO and consultant blogs (e.g. Forrester, Gartner, and the like). We could further disseminate our research by contributing to emerging electronic media with blogs, social network pages and other broadcasting. Initiatives might include journal editors writing editorials reflecting on the research impact of a research stream and using digital design methods like Reddit, TedTalks and YouTube to promote our research. In some countries and universities interaction with media such as television interviews also contribute significant to the cumulative research impact. Incentives for such work might include expanding the range of valued research at “top” institutions where such work may be currently modestly valued and recognition and encouragement of such work by organizations representing the community such as AIS and the senior scholars, to supplement the benefits for those whose institutions already recognize and reward this type of work.

Action 3: Better align resources and incentives with impactful research

To the extent that impact is embedded in or exhibited by individual work, both scholarly associations and universities need to develop resources and incentive systems that recognize researchers for the effort and delivery of impactful research. This alignment requires recognizing impact when we look for it. Institutions, especially the Association for Information Systems (AIS) and related groups such as the Academy of Management, ACM, and the like, could originate tools that recognize and measure research impact. As individual schools and scholars develop such tools, these institutions could have a hand in promoting these for internal use amongst ourselves as well as among funding agencies and regulators such as AACSB. If you follow the argument that such funding and accreditation agencies will eventually enact these tools, it is worth our while to be involved in and possibly lead the way developing intelligent measures rather than accepting whatever anomalous, inconsistent, and “tangible, immediate only” measures these groups propose.

Action 4: Build more potential for impact into all our research projects

Much of our research is about understanding the interaction of people, processes, and technology, rather than aimed at solving immediate business problems. This however, does not exclude the potential for seeing how (perhaps with additional knowledge that is known to be missing) can be applied. For example, fundamental knowledge about the diffusion of technology and reactions of people to particular categories of features can provide insight to building particular interfaces. The scholars of such fundamental knowledge may not be held to this second phase in application, but the statement of such a linkage may in itself create impact value. It can do this by showing the way for others to create such application knowledge. By the same token, we can create reward and prestige for those who generate this application-oriented knowledge. Applying results from prior studies in new situations and testing their value when instantiated serves as a valuable link between “pure” or fundamental research and practical significance. We cannot expect scholars to undertake such studies if they are unpublishable or if they are treated as secondary and unimportant.

Action 5: Focus more on research units and streams and their diverse impacts.

The IS field may face danger from misplaced evaluation. We tend to evaluate the lowest level unit (e.g. the individual worker) under the hidden assumption that the outcomes of the group are the sum of contributions of each individual. It is arguable if there is value in such evaluation (e.g. to the positive it may stimulate some individuals to higher levels or particular types of performance) but it is clear if we want an assembly line to function effectively it requires a level of organization beyond the individual performance of each employee. We must keep in mind techniques for allocating the benefits of research streams, research communities, and the IS field overall if we do...
want to show how individual work has value as part of a larger pattern in addition to its unique effects. Both AACSB in the US and the Funding Councils in the UK, require that individuals demonstrate the effects of journal articles, so we cannot ignore the individual study level of performance evaluation. AACSB is particularly interested in top journal publications whereas academic impact in the UK is necessary but not sufficient. UK academics have to show how their research impacts individuals, governments and society. The research assessment techniques that we propose should consider both direct and indirect impacts like impact in the classroom and curriculum, in conjunction with other studies to formulate and test larger units of knowledge, and in the laboratory, in terms of reflecting how we perform research and evaluate new understanding.

**Action 6: Let others help us.**

Research impact assessment spans beyond the IS community. Others in many of our universities are engaged in the struggle for good processes and measures. Our field needs to leverage these opportunities. For example, all schools in Birkbeck and many in other UK institutions now employ ‘Impact Managers’ who assist academics in ensuring that their research has impact and that the evidence of that impact is systematically collated. Funders are now requiring impact plans and institutions are devoting financial resources to impact.

**Lesson 7: Undertake more joint activities with practitioner organizations**

Having former or current Ph.D students work in industry can help extend the impact of our research. Some strategies may be executive doctoral programs and placing Ph.D.’s in industry collaborations. The executives that executive doctoral programs cater to can take the frameworks and theories introduced in class and implement them in the workplace. TUM’s industry collaborations with Audi and BMW provide an example of how Ph.D. students can begin a research project during their Ph.D. program and then work on implementing the project as an employee. This project implementation may move beyond academic ideas and impact industry.

**VI. CONCLUSION**

As IS academics we want our research to make a difference and positively impact individuals, industry and society. Yet, increasingly, our stakeholders (i.e., funding agencies, governments, accreditation agencies and taxpayers) want proof that the millions of dollars they provide are funding relevant research. This paper has shared some ideas on how the IS field can assess the impact of our research.

As a field, we need to self-regulate and develop assessment techniques rather than allowing stakeholders to impose assessment on us. An article entitled, “Measuring Faculty Impact,” in the September/October issues of BizEd shows the momentum impact measurement is gaining [Shinn, 2014]. By proposing our own assessment techniques, we can highlight the difference IS research makes and hopefully avoid diverting precious time to non-value added tasks. It is our contention that even if you believe that our field’s impact is already sufficient or at least equivalent to other fields (for example do we ask art history to have an impact on society?), it is difficult to argue that we aren’t all better off with more impact and better communication about the impact that we do have.

We hope this panel write-up stirs scholarly debate on assessing research impact and leads the IS field to continuously reflect on the contributions we have made. We are confident that the field is generating useful and impactful work; we are certain that it can and likely will be doing more in the future.

**REFERENCES**


ABOUT THE AUTHORS

Kevin Crowston is a Distinguished Professor of Information Science in the School of Information Studies at Syracuse University. His research examines new ways of organizing made possible by the extensive use of information and communications technology. Specific research topics include the development practices of Free/Libre Open Source Software teams and work practices and technology support for citizen science research projects, both with past NSF support. He is co-editor-in-chief of the journal *Information, Technology & People*, Chair of the Organizational Communications and Information Systems Division of the Academy of Management and Vice Chair of the International Federation for Information Processing (IFIP) Working Group 8.2 on Information Systems and Organizations. He is presently serving as a program director for the Cyber-Human Systems program at the US National Science Foundation in the Division of Information and Intelligent Systems in the Directorate for Computer and Information Science and Engineering.

Hope Koch is an Associate Professor in Baylor University’s IS program, where she leads the program’s recruiting and career development efforts. Hope has received numerous recognitions for her program-building efforts, including the ConocoPhillips’ Faculty Development Fellowship and the Southwestern Business Dean’s Association Innovative Achievement Award. Hope’s research focuses on organizational assimilation of new, innovative technologies. Hope publishes in leading academic journals such as *MIS Quarterly*, *MIS Quarterly Executive* and the *European Journal of Information Systems* (EJIS). In 2013, the *European Journal of Information Systems* and the Operations Research Society recognized her social networking research as the best paper published in 2012. Since 2002, Hope has chaired the Callaway Foundation which grants $500,000 in college scholarship annually.

Helmut Krcmar is currently serving as the President-elect of AIS and will then serve as its 20th President. Prof. Dr. Krcmar serves as Dean Faculty Computer Science and Professor of Information Systems with a joint appointment to the Business School at Technische Universität München (TUM). He serves as Scientific Director of Information Management at fortiss GmbH, an applied research Institute for Software, Systems, and Services. He serves as a Member of the Supervisory Board at IMIC Information Multimedia Communication AG since 2007, on the data security and privacy board at Deutsche Bahn und is president of the german nationa E-Government Competence Center (NEGZ). He is broadly published in the IS field, especially regarding Information Management and has long served as an advocate of research that matters in support of IS practice. He will therefore focus on the subjects of collaboration between German universities and the surrounding business and technical ecosystems as well as the need for diversity in research approaches.

Fred Niederman serves as the Shaughnessy Endowed Professor of MIS at Saint Louis University. He obtained an MBA and a Ph.D. in Management Information Systems from the University of Minnesota. His research interests include building global information management, MIS personnel, and using MIS to support teams and groups. Recently he has been investigating the integration of MIS functions after corporate mergers and acquisitions. He is a proponent of grounded theory and theory building as a way to enrich the MIS discipline and build intellectual content customized specifically to our field of practice. He has published more than one hundred articles in leading research journals and refereed conference proceedings. He serves on editorial boards for *TMIS, JAIS, CAIS, Human Resource Management, Journal of International Management, IEEE Transactions on Engineering Management* and the *Journal of Global Information Management*. He has edited or co-edited special issues for *CACM, DATABASE, Journal of Global Information Management, Journal of Organizational Computing and E-Commerce* and *Human Resource Management*. He recently served as co-program chair for the 2010 ICIS conference in St. Louis, Missouri, and is an active member in the MIS “senior scholars”.

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