From Theory to Practice: Experiences of Industry-Academia Collaboration from a Practitioner

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ABSTRACT

This is an experience report on industry-academia cooperation. It goes into challenges faced by industry to work with academia and to adopt academic research results. There are four types of challenges described:

- Relevance
- Practicality
- Agility
- Accessibility

Each challenge is described from the practitioner point of view. Academic research and research result format is compared to popular non-academic knowledge sources such as industry conferences and blogs. The strength and weaknesses of academic research compared to these alternatives is discussed. Finally, experiences from different solutions that have been tried to bridge this gap are described as well as possible future solutions.

KEYWORDS

industry-academia collaboration, research adoption by industry, involving practitioners in research

1 INTRODUCTION

This is an experience report from a company that was founded in a university student corridor three decades ago and has had close connection to the university ever since. The company is, and has been, involved in several software engineering research initiatives, but has found some challenges with the gap between academia and industry. The following four challenges describe this gap: Relevance, Practicality, Agility and Accessibility.

2 CHALLENGES

2.1 Relevance

Relevance is a challenge, as the topics of interest for researchers often do not align well with the company. Of course research should include topics that practitioners do not have interest in, but for those cases where industry-academia collaboration is supposed to happen, this would be beneficial. There are probably several reason for this disconnect. From our experience an important part of the gap is related to the fact that researchers are highly motivated to publish research, while the company is not. This has created a gap where researchers have been reluctant to continue researching topics where they see low chances of getting publishable results. On the other hand, the company seems to underappreciate the importance of publishing, which is an important part of what differentiates research from consultancy. This gap needs to be bridged from both sides. Fortunately the interest of industry and academia seems to be getting more aligned in recent years, but more could be done.

2.2 Practicality

Practicality has to do with the applicability of the research results. This is closely related to relevance, but instead of being about

what we choose to do research on, it is rather on the results themselves. It is closely related to Relevance as the root problem might also be the "interest in publishing" problem. It is an important part of academic research to publish research papers. However, it seems in our experience that the success of a research papers is primarily measured by academic interest rather than interest by practitioners. Maybe this should be this way, but it definitely creates a gap where researchers are primarily writing for other researchers and not for practitioners. Another aspect that contributes to this gap is the time horizon, where researcher are often looking several years into the future when practitioners are often focused on short term application. Again, the gap needs to be bridged from both sides. Any solution to this problem should preferably avoid pushing academia too far in the direction of "industry result focus".

2.3 Agility

Agility is a challenge when researchers are bound by the traditions of universities, academic convention or bureaucratic rules of public funding. Research projects that span over several years, are waterfallish in nature and require overhead by industrial participants are an example where industry practitioners that have grown accustomed to agile and lean practices will find frustration. We have seen a fair share of these kind of challenges, but have also seen examples where this is not the case.

2.4 Accessibility

Accessibility refers to the problem that the industry practitioners find it more accessible to read blogs or watch YouTube videos than read research results. Practitioners could certainly get better at reading research papers. But, to be honest, the academic research paper is not a very user friendly format for practitioners. The large majority of the practitioners leave university after their master's degree. For them a PDF that follows the conventions of academia has a difficulty competing with a blog or a tweet. The solution is of course not to dumb down research, when the whole point of research is to avoid the idiocy of tweeted opinions. But a more user friendly format to access the results could be explored.

3 POSSIBLE SOLUTIONS

Relevance, Practicality and Agility have been more or less solved for the company in this experience report with a research collaboration between several universities in Sweden and several international companies (http://software-center.se). The companies provide data and access to practitioners as well as funding. In turn, they will choose which research to fund. Continuity is preserved by long term goals and research themes, while agility is achieved by working in 6 month sprints. Any research that has lost relevance or is showing lack of practicality will simply be ended. Being an experience report from a company, we can only speculate on how the researchers feel about this. But most practitioners at this specific company, including the speaker, now avoid any research that is any less lean and agile than this. If that is good or bad is up for discussion.

The problem of accessibility is still not solved for this company. The experience is that engaging practitioners during research, such as in workshops or focus groups, is helpful. A recent experiment of using interactive posters to collect data and engage practitioners has shown some promise. However, increasing engagement of practitioners in the research will most likely only be a small part of any solution. Summarizing research results in a more accessible format for practitioners is another likely piece of the puzzle. Simply making a blog post about the research being done should in theory bridge the gap, but we have yet to put that into practice.