

# Engineering YES: Identifying Successful Routes to Market for University-based Innovation

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**N**ot all great inventions can be transferred into marketable business propositions. This counter intuitive fact is one that has been reinforced upon me with unnerving regularity since the start of my EngD at the University of Nottingham. Actually, as it happens, not only do not all great inventions automatically get transferred into marketable business propositions, but it is extremely rare for this to happen.

The Engineering YES competition, jointly organised by the Universities of Nottingham, Loughborough University and the Rotary Club of Loughborough Beacon, now in its third year, certainly makes this clear. Unlike other sources of the same notion however, it goes one step further by offering invaluable experience to participating research students as to how they might one day overcome the pitfalls of university knowledge transfer. It does this by endowing teams of 3 to 6 people with the useful hands on experience of designing and presenting a mock business plan for a fictional start-up company. The only rule is that the technological feature on which the business plan is drawn must have been designed within a university. Dragons' Den style, a presentation of this "plan" is made to a panel of judging "investors", with the team deemed to be have most viable investment opportunity being declared the winner. Simple...



Engineering YES can be considered similar to Dragons' Den in many ways

Well not really! One thing the four-day course makes clear is that nothing about starting up a company is simple or straightforward. This is especially so where issues concerning protection of intellectual property

are concerned, as the business of securing patents is necessarily and painstakingly rigorous. That is not to say that other issues such as financial management, development of further products and marketing strategies can be overlooked: The Engineering YES provides an appreciation for the fact that without every single one of these aspects being close to perfect, the business has little chance of success.

I have to admit, that before arriving for the course, my expectations were that we would attend a few seminars, network with a few people from the relevant fields and work on our business plan for an hour or so per day, almost as an afterthought to the numerous other points of interest on offer. As it turned out, all my expectations were realised, except for the fact that the work required to prepare the plan could not be fit into a mere few hours per day. The four days I was there, the earliest I climbed into bed was 3:35AM!



Many aspects of business management have to be discussed carefully to be able to present an investable opportunity to the judges

This, more than anything, made me appreciate the scale of work needed to make university-based inventions marketable. Beforehand, I always had it in my mind that any such invention which was semi-decent would find its way to market almost automatically. In an environment where the focus is for us, as research students, to identify and understand the leading-edge technology and its underlying science, it is easy to get carried away with the concept that if it is new, exciting and has a novel application then someone, somewhere will want to pay money for it. The MSc module Innovation and Technology Transfer which Research Engineers on our

EngD course take in their first year also goes some way to reinforcing the notion that designing something novel is only the first, and one of the more simple steps in very many more towards creating a successful and sustainable business venture.

The trouble is that this message becomes somewhat diluted over the course of our daily research. Other modules and early stage research activities such as the literature review and summer school are all carried out hinging on the idea that the topic of our research has a clear route to market, and, one day, will make the university lots of money. The EngD reflective essay, usually completed early in the first year for example, requires the student to consider the possible deployment of the technological area of their research; a task which has an inherent requirement to think about marketing and selling the idea. The statistics show that, in all likelihood, this eventuality will not transpire.

Really, the principal requirement for an EngD (or any other doctoral research) to be deemed a success is that it adds something new to what is already known; introducing a novel step to further the knowledge or pushing the boundary forwards. Very few research students will get to the end of their research to be told their contribution is of little academic value. This suggests that most postgraduate research undertaken within universities is an addition to the knowledge. So why are precious few of these ever translated into profitable ventures? There is, in my opinion, a subtle difference between ideas which further the scientific knowledge and those which can make money: Any solution to a problem not previously considered may advance knowledge within a field, either for its own sake, or to be used again in the hierarchical structure of scientific knowledge, but forming a business plan based on new ideas, no matter how ingenious, carries a risk. This is why much of the research carried out within universities will never be considered as a potential business venture, despite its scientific value.

Of course, some university-based inventions really are just that ingenious, capable of capturing a slice of the world-wide market. But my previous assumption that such inventions will automatically find their way to market doesn't hold, even in these cases. Testament to this fact is the increasing amount universities now spend on the expertise of those who can make a successful business of these and there is now, more than ever before, an appreciation for how difficult the process is. Universities now have whole knowledge transfer departments and networks, whose specialism is to identify the select few innovations from within the organisation and ensure, either through internal development or external

collaboration, that they are adequately fostered through to becoming a successful business enterprise. There is a sharp focus on obtaining the appropriate legal protection for these innovative ideas: Gone are the days when universities wantonly patented every invention they thought they could get in the hope that they might one day be able to sell it on. Now is the time of careful planning for the select few opportunities which have been identified as being able to make a large impact in the market.

The Engineering YES reminds us of how important it is to bear the scale of this planning in mind, offering prizes not just for the most investable opportunity, but for other important accomplishments such as having the best elevator pitch (the ability to promote your product in 30 seconds; roughly the duration of an elevator ride) and best team work.



The team of research students (including myself) from the University of Nottingham, having assumed the identity "KARDIA SOLUTIONS" receiving the prize for best team work at the 2011 Engineering YES East-Midlands Heat. In photo (L-R): Bryan Woodward (Rotary Club of Loughborough Beacon), Allan Love, Jiin Woei Lee, Akinola Adeniyi, Thomas Demetriades, Sugandha Dhar, Varindra Kumar

Having competed in the East Midlands heat of Engineering YES 2011 myself, I feel I will benefit immensely from the experience and the lessons learned there. I will remember the content of some of the presentations given there for many years to come, and I hope I will have the chance to meet the people I met there again. Above all, I feel the Engineering YES has realigned my expectations of what my own personal research can achieve (this will apply both during and after my EngD), and that just because it may never earn millions of pounds in revenue, it doesn't mean to say it cannot be deemed a success. This is a notion I feel all postgraduate researchers should bear in mind. Moreover, I feel the appreciation of what is needed to make successful business ventures out of university research could keep my own work more grounded, and give more realistic consideration to its applications going forward. As a research student on the EngD course, where industrial and commercial relevance is a key consideration, this is going to be a massive benefit. ■