The Remainder of an Unbalanced Equation: Moving from Science & Technology Studies to Information Science

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Neo: Why am I here?

Architect: Your life is the sum of a remainder of an unbalanced equation inherent to the programming of the matrix. You are the eventuality of an anomaly, which despite my sincerest efforts I have been unable to eliminate from what is otherwise a harmony of mathematical precision…[1]

INTRODUCTION

When discussing the difficulties faced by interdisciplinary researchers, we often talk about issues of methodology *(how to study what you want to study)*, of scope *(how to limit the mess in our research)*, of access *(how to interpret the work done in different disciplines)*, of audience *(who do we want to talk to)*, and of profession *(what kind of job can we get or should aim for)*. All of these are important issues. However, I argue that there exists another set of pertinent, often overlooked, challenges faced by interdisciplinary researchers. These challenges are, in my opinion, especially – but not exclusively – salient for junior interdisciplinary researchers who constantly straddle between two or more disciplines. These arise within everyday interpretations of the professional identity of these researchers. That is: not only the ways in which my colleagues[1] interpret what I do, how I do it, and why I do it, but also what my colleagues expect of me and my work when they hear that I am from x or y department or that I am doing a Ph.D. in x or y field. In this paper, I will talk about how I have experienced this specific challenge in my own lived experiences of being an "Information Science Ph.D. student." In particular, I will describe this challenge within the explicit context of my own movement from the field of Science & Technology Studies (STS) to the field of Information Science (IS).[2]

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[1] I use the term "colleague" to refer to my peers, colleagues, and faculty members.

[2] Two things are important. First, I don't use the word "field" to demarcate or reify a discipline. It is hard to define the limits of STS or IS as a field. I only use these words in the sense of institutional/disciplinary labels that are assigned to people when they are in either department. For this paper, it does not matter what *exactly* is STS or IS. Instead, what matters is the recognition that even though it may be hard to define what one means by STS or IS, researchers use these labels constantly in their everyday lives. Second, in this paper I do not make generalized claims about any and all STS and IS departments. I did my STS masters in a *particular* and *unique* department, and I am currently doing my

MOVING FROM ENGINEERING TO STS

As an undergraduate, I was trained as an Information & Communication Technology (ICT) engineer at the Dhirubhai Ambani Institute of ICT in India. ICT engineering, in the way I was taught, comprises of computer science, software engineering, electrical and electronic engineering, and humanities and social sciences. Thanks to a wonderful mentor – *Shiv Visvanathan* – who introduced me to the sociology of science & technology during my junior year, after finishing my undergraduate degree I went to Netherlands to pursue a research master in STS at Maastricht University.

Why did I move from engineering to STS? To be honest, the move was impulsive, at best. When Shiv made me read certain STS papers, I made the obvious realization that there is far more to the scientific and engineering practice than what was taught in my technical courses. However, beyond giving me a cursory sensitivity towards the sociocultural and political contexts within which science and technology is embedded, the STS readings were themselves quite difficult to understand especially for an engineer like myself who was a non-native English speaker.[3] It was only over multiple conversations with Shiv, and other social science and humanities faculty members at my university, that I was able to make *some* sense out of what I was reading.

However, I soon felt uneasy, especially at the time, because not only were most STS texts hard to understand for engineers like myself but also not all engineers, at least in India, had access to social scientists, let alone to STS researchers, that I had in my university. This led me to make an impulsive and seemingly naïve observation: I felt that I, as an engineer, can learn what STS had to offer and then try to tell what I had learned from STS to engineers in

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Ph.D. in IS in a *particular* and *unique* department as well. In this sense, my claims should be read more as claims about only these departments. However, there are often commonalities between departments with the same disciplinary labels. In that sense I strongly invite the reader to compare and contrast my experiences with the experiences he/she/they might have had with other STS/IS departments.

[3] To be fair, at that time I did find the sociological texts to be more accessible than the philosophical ones, but since it was the philosophical ones that intrigued me the most, I ended up reading much more of those, and those weren't easy.

a language that they would understand better.[4] Thus, with a newfound interest in the sociology of science and technology, along with the idea that maybe I can further the bridge between STS and engineering, I moved to STS.

This move from engineering to STS, as people with mixed backgrounds can attest to, was not easy. The move was, in fact, frustrating – *conceptually* (learning to think about science and engineering in new ways that did not always align with my own undergraduate experiences), *methodologically* (learning how to do STS, what counts as legitimate STS research, what you can and cannot say, etc.), and *personally* (being an engineer myself, I often felt schizophrenic – a part of me was an engineering student and the other part of me was learning to be an STS student). However, this was not the first time I was facing such frustration. I had faced similar issues even with the STS papers that Shiv had made me read. The difference was that I soon realized that it is one thing to be in an engineering department and read an STS paper; and, it is something very different to be in a STS department and then read an STS paper.

Every discipline has its own sense of rightness and wrongness. Different people interpreted my frustration in different ways. On one hand, some saw this as: *here is a student who is facing difficulties with STS texts.* This is a general observation that could apply to anyone who enters the field of STS, or any other field, for the first time. On the other hand, some saw this as: *here is an engineering student who is facing difficulties with STS texts.* This is not the general case. Here, my identity of an engineering student is explicitly invoked with regard to my perceived difficulties. I was not just *any* student. I was a *particular* student who had come from a *particular* field that also happens to be the research subject of this new field. "You still think like an engineer" was a sentiment that was sometimes explicitly and often implicitly shared with me during my masters.

In any case, I did make the move from engineering to STS, or so I would like to believe. I finished my masters in 2012. After that, I started the Ph.D. program in Information Science at Cornell University in 2013. (In the year in between, I worked as a junior researcher with the eHumanities group at the Royal Netherlands Academy of Arts & Sciences in Amsterdam, Netherlands.).

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[4] I must make something very clear at this point. This is not a critique of STS. This is more of an audience question – *who is STS writing for?* There are many places, as I would later realize, in which STS directly writes for engineers. My then feeling that STS is impenetrable for engineers like me was more of an artifact of what I chose to read than a characteristic of the discipline at large. That said, I do believe that disciplines with a critical bend, STS and IS included, often tend to turn inwards, speaking more to insiders than to outsiders.

MOVING FROM STS TO IS

In hindsight, the STS master was one of the most formative, rewarding, and one of the best experiences I have ever had in my life. Yes, I was sometimes frustrated with certain things, but I thoroughly enjoyed the learning experience. The fact that I still strive to do work that, at least according to me, draws heavily on and tries to speak to the work of STS scholars should signify the seriousness of my attempt to engage with STS. *Why then did I move from STS to IS?*

When I finished my STS masters, I faced an interesting choice: either go back to being an engineer with all that I had learned or stay in STS. I chose to stay. In fact, at this point I decided to pursue a Ph.D. in STS. By this time, I had really started to enjoy reading STS texts, being an STS researcher, and having wonderful conversations with other researchers. At this point, I – like many other budding STS students – really wanted to prove myself as a researcher and to be acknowledged as someone doing good research. But, at the same time, I also wanted two other things. First, as before, I still wanted to work with and write for engineers. Second, I wanted to do STS in a way in which I could draw explicitly and heavily on my engineering knowledge. Of course, being an engineer had already helped me immensely in my STS training. But now, I felt I did not just want to research what engineers did, why they did it, etc. I also wanted to do things with them, to the extent possible, to actually learn the underlying concepts, and to apply them on my own. To put it succinctly, at that time I not only wanted to work towards a sociology of engineering but also wanted to locate, situate, and demonstrate sociological concepts within and through engineering technicalities (e.g., code, graphs, proofs).

It was at this time that a very close friend of mine – *Ranjit Singh* – told me about the overlap and affinity between the fields of IS and STS. I had known about the field of IS for some time now. Ranjit had done the same STS masters from Maastricht and then gone on to join the Ph.D. program in STS at Cornell University. During his first semester at Cornell, he took an IS course taught by Steve Jackson. It was based on his experiences in this course, as well as his conversations with Steve, that Ranjit told me that there was a strong overlap between STS and IS, at least at Cornell. Once I started searching online for IS programs, I came to know more about IS scholars such as Steve Jackson, Phoebe Sengers, Tarleton Gillespie, and Paul Edwards. The more I searched, the more I got excited. Here was a field that – at that time – seemed like a mixed bag of information scientists, sociologists, anthropologists, computer scientists, etc. This seemed like the place in which I thought I could *do* STS and engineering at the same time. When I got in touch with some of the IS scholars in the US, I got nothing but warm and enthusiastic replies. It was then that I decided to apply to IS Ph.D. programs.

Having described my move from engineering to STS to IS, I introduce the challenges I have faced during my two years as an IS Ph.D. student at Cornell in the next section.

LIVING *WITH* AND *THROUGH* CATEGORIES

Over time, we have come to realize that the world is full of categories. People, practices, things, and actions – everything is, for better or for worse, put under some category somewhere by someone for some purpose. We know that 'categories are violent' (reducing things to fit categories), 'categories marginalize' (if you do not fit, you are left out), and that 'categories are political' (acts of power). In fact, I am sure that everyone at this workshop will agree when I say that things, more often than not, do not fit categories. That is: the act of labeling, of saying that *this* thing right here belongs to *this* category, is a highly contentious act. As soon as we hear someone say, "that is just x," our "critical" minds jump up in joy because now we can ask all the juicy questions such as: what is x, who decides what is and is not x, or who came up with x and why? My aim with this description is NOT to try to poke fun at the practice of researching categories. I personally believe that knowing how categories are used, how they are maintained, how they break down, how they marginalize, and how they have implications for the categorized is extremely important for any form of "critical" studies.

But, if I believe in all of this and if I know that everyone at this workshop also believes in all of this then what was the point of me writing the previous paragraph? Let me use a personal anecdote to guide you towards an answer to this question. Sometime back, in a conversation with a group of researchers from multiple disciplines, I was trying to make a point. I said that, in my opinion, in STS there seems to be a tendency to distance oneself from ones research subjects. Now, having had a graduate degree in STS, having had many discussions with STS professors and students, and considering myself an STS researcher of sorts, I had naively thought that I was qualified to make this point. Of course, I knew that not *all* STS scholars distance themselves from their research subjects. But, I wanted to say that this practice – of distancing – was a marked STS trait. I don't remember it verbatim, but here is how this conversation unfolded between me and another group member:

Me: So, there is this STS thing… that STS researchers often say, "I am just going to study how things happen. I am just *describing* things with no stake in explanation." I mean, who actually believes this?

Group Member: I don't think *that's* what STS does or that *that* is an S-T-S thing.

Me: Ok, but I see it a lot in STS papers [in Social Studies of Science] and also when I talk to other people from STS.

Group Member: … we don't want to argue over what is and is not STS. I mean, is that even clear? What is STS? Who is an STS person? Are we all here doing STS? It is not very helpful to use such categories.

So, here I was trying to make a point about STS; instead, I was told that I, in fact, was just throwing around an ambiguous category. Now: STS might be a contentious, socially constructed, and undefined category; but for me it is and has been very *real*. The same goes for the category of IS. They are real insofar as they have real consequences for how people interpret my work, my thought process, and me. They are real in that they limit where I publish, who is my audience, what grants I apply for, what jobs I apply for, etc. Didn't you and me just agree that categories have real implications for the categorized? Why then was this person retaliating against what I said? Is it because I was factually wrong? Was I really just throwing around a category? Was it because this particular group member happens to be from the STS department and I am not from that department anymore? Or, was it the fact that we, as critical researchers, often forget that categories also apply to us and not just to our research subjects?

The last question in the previous paragraph is telling. The more I think about it, the more I realize that researchers, including myself, often take the *socially constructed* nature of categories as an excuse to deny the category the reality it constitutes and is constitutive of. In fact, we often forget that we ourselves are also the categorized: instantiations of categories (e.g., critical researchers, artists, sociologists, historians, STS scholars, IS scholars, etc.) that you, others, and me enact everyday in more ways than one.

Having moved from STS to IS, I have been caught living with, between, and through these two categories especially over the past two years. It seems easy to say that I am just an "IS Ph.D. student." However, the lived experience of that label, especially because of my background in STS and engineering, is anything but simple. In the next two sections I describe two particular ways in which my STS & IS colleagues have come to categorize me.

AN *STS* PERSON WHO HAPPENS TO BE IN *IS*

The first of two ways: *I am seen primarily as a STS person who just happens to be in an IS department.* I have found that my STS and IS colleagues who categorize me in such a way mean different things with this categorization.

On one hand, some of my IS colleagues, who primarily see me as a STS person in an IS department, often have two different sentiments attached to this categorization. The first sentiment is *celebratory*. They see me as being symbolic of the "diversity" of IS as a field. I am the embodiment of what is commonly referred to as "interdisciplinarity." The second sentiment is *pedantic*. When talking to them I often feel a lingering insinuation that there are technical aspects of things that I "don't get" or that I "overlook." "Let me tell you how x actually works" – I have had my fair share of such lines. I am not a technical expert (and I never claim to be one); thus, it is helpful when someone points out things I did not know or did not understand. However, it is not hard to imagine why repeated doses of pedantic conversations can seem more didactic than instructive.

On the other hand, some of my STS colleagues, who primarily see me as a STS person in an IS department, have two different sentiments attached to this categorization as well. The first sentiment is *celebratory*. They see me as doing "cool" STS research – one in which I am not scared of getting my hands dirty in "technical practice" and "mixing" disciplines in interesting ways. "It is cool that you can actually do what you study" – I have had my fair share of such lines. This categorization, I must admit, feels generative. After all, this was one of the main reasons that over time made me move from engineering to STS to IS. It feels nice when someone appreciates my reasons for doing so. The second sentiment is that of *demarcation*. These STS colleagues see me as doing STS, but different. Whereas I was clearly doing STS work two years ago, these STS colleagues now choose to describe my work as being STS-*ish*. In between different groups of STS colleagues, I am still trying to figure out whether STS-*ish* means STS plus something or whether it means STS minus something.

AN *IS* PERSON WHO HAPPENS TO DO *STS*
The second of two ways: *I am seen primarily as an IS person who just happens to do some STS work.*

On one hand, some of my IS colleagues, who primarily see me as an IS person doing STS work, often have two different interpretations of a *celebratory* sentiment. The first is: *celebration of diversity*. I am seen as doing something different, required, and unique. I am symbolic of the "diversity" of IS as a discipline. The second interpretation is: *celebration of the social*. Whereas some IS colleagues see me as a necessary part of the "critical wing" of IS, others seem to see me as an embodiment of what is commonly referred to as "the social." The STS researcher in me feels uncomfortable with such a reified distinction between technical and social, while the engineer in me feels left out when all that these people see is my "social" side.

On the other hand, some of my STS colleagues, who primarily see me as an IS person doing STS work, have two different interpretations of a *pedantic* sentiment. The first is: *have you thought about this and that?* These colleagues seem to celebrate my movement between disciplines. They do feel that I am doing "good work." However, they also seem to think that what I am doing is actually not STS but STS-ish. These are folks who flag very specific types of issues. "Do you not worry about going native?" "I feel you are too close to what you are studying." These are the kind of questions that they raise. It seems like they see me as a person who maybe hasn't thought things through. Once again, I am back to being seen an IS student facing difficulties with STS and not just any student facing difficulties with STS.

The second interpretation is: *you can get away with that in IS*. These STS colleagues of mine have a very different interpretation of my work. When these colleagues see my "STS work" or my "use of STS concepts," what they seem to see is an IS student getting away with incomplete or incorrect interpretations and applications of STS concepts, theories, and methods. "Yeah, you can do that in IS" or "You can never do that in an STS department" are statements that I have heard more than a fair number of times.

THE REMAINDER OF AN UNBALANCED EQUATION
Before I wrap up, I want to point out that my life is not as grim as my last two sections portray. I love what I do. Yes, the last two sections portray reality. This is how I am categorized a lot of the times. But, there are also other times at which I have inspiring as well as generative conversations with my STS & IS colleagues. Not all of my STS colleagues think that I am getting away with things, and not all of my IS colleagues merely treat me as a trophy.

However, I have come to believe that I am not really an engineer, an STS researcher, or an IS researcher. I don't fit neatly in any of the three boxes, though I might institutionally reside in one of them. I believe that interdisciplinary researchers are really, what The Architect calls, remainders of unbalanced equations. In this way, I treat my sporadic sense of *non-belonging* as an artifact of interdisciplinarity. That said: I am still unsure whether I should lament or romanticize such artifactuality.

What I am sure about, however, is that interdisciplinary researchers, like me, who straddle between two or more disciplines face identity challenges similar to the ones that I have described. Our new disciplines often see us as *being* different, while our old disciplines often see us as *doing* something different. In between these extremes lies the everyday of junior interdisciplinary researchers like me. It takes enormous amount of work to describe, explain, enact, and validate the work that we do to our mixed bag of colleagues. Yes, some of us might argue that it is "cool" and "trendy" to not belong anywhere but everywhere. Who wants to be one thing when you could be anything and everything, right? But, that doesn't change the fact that even "cool" and "trendy" people reside in specific departments, sit in particular buildings, apply for specific jobs, and are seen as practitioners of things with specific labels. There is a world of difference between *being an STS person who happens to be in IS* and *being an IS person who happens do STS work*. Yes, I recognize that what I do cannot be captured with such a dualism. But, that doesn't mean that the dualism doesn't exist or that I am not caught up in it. I categorize, and am categorized, every day. Maybe I should just learn to live with that.

ACKNOWLEDGMENTS

REFERENCES
1. Wachowski, A. (Director) & Wachowski, L. (Director). (2003). *The Matrix Reloaded* [Motion Picture]. United States: Fox Studios.