Making Markets Emerge: Enumeration, ‘Development’ and Technology Markets

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[H1] Introduction

Market relationships, both as people live them and as anthropologists talk about them, soon encounter quantitative measurement in one form of another. As an anthropologist in industry, I am occasionally asked for my point of view on the numbers produced by marketing firms or industry analysts. On other occasions, my point of view is treated as secondary to numbers, as if numbers, rather than ethnographic description, were self-evidently the more legitimate form of knowledge. Anthropologists in industry often encounter these numbers in Cefkin’s (2012) sense of an encounter. Following Asad (1973), Cefkin treats encounters as unexpected events, at times a clash, that require us to wrestle with how we might be both complicit in, and resistant to, more powerful forms of knowledge.

Other kinds of scholarship have had their encounters with numbers too. Within business schools, consumer culture theory succeeded in developing new perspectives on markets beyond the firm-centric views that dominate business schools. Developing this perspective required getting beyond numbers as the only possible form of knowledge production. This took place in a context where business schools had been shaped by Cold War-era politics where enumerating knowledge about markets was a politically convenient way of narrowing the frame of enquiry,
and avoiding the politically problematic questions that the other social sciences raised about capitalism (Tadajewski 2006).

Economic sociology inspired by Michel Callon (1998) could be added to this list of disciplines encountering the quantitative. It has entirely rethought the role of quantitative measures in markets, focusing on numbers as self-fulfilling performances. If we believe, as many of us did before the Great Recession, that universal, mathematical laws of the markets apply everywhere, then that belief sets those “laws” into practice regardless of whether they are “true.” The “market value” may have had more to do with abstractions upon abstractions of economic modeling which few people actually understand, and which eventually brought the whole thing tumbling down, but it also became “true,” at least for a time, if enough people act as if they are convinced by it. In a context where credit default swaps and algorithmic trading no longer merely model the market, but actively perform in it, the consequences of the numbers we produce in the world are serious. We qualitative researchers may not like numbers as our preferred tools of the trade, but we do need to acknowledge them as things in the world, with their own social lives. In a world full of numbers, our encounter with the quantitative cannot be limited to raising epistemological objections to its assumptions.

My own encounter with the quantitative has centered on questions of economic development, and whether development does or does not indicate promising technology markets. At minimum, development organizes markets through measurements that divide the world into either emerging markets or mature ones. This organization is simple, but its making involves a highly complex set of social practices. Here I reflect ethnographically on how discourses of economic development are operationalized and practiced through numbers. It is not enough to simply critique the assumptions on which those numbers are based. I also wish to suggest a role
for number in changing things. This requires us to consider not just the assumptions these numbers make, but also their social lives: how they are circulated within and between institutions, and the kinds of relationships they sustain or subvert.

Like most anthropology of development (Ferguson 1994, Escobar 1994, DeSoto 2003) I do not take development to be an *a priori* economic fact where some countries can be said to be more developed than others. Instead I view it as a historically and socially situated discourse that organizes hierarchical relationships. If we look at development in this way, it is not hard to see how quantitative measurements of economic development, and the subsequent measures of market opportunities, are shaped not just by the brute “facts” of wealth, but also beliefs about what constitutes progress, what social groupings can be said to have it (cities, countries, etc.). As the measures get more complex, and embedded in daily economic life, the relations between wealth, neoliberal public policies and technology adoption get more deeply intertwined. Beliefs about what development is, pre-figures whether a market exists at all from a firm point of view. Even before goods are made and marketed, firms routinely make decisions about which people are ‘ready’ to be consumers at all. Conversely, places said to lack development are deemed not ‘ready’ and thus not even a market. In this sense, seeing like a corporation in some ways not dissimilar to seeing like a state (Scott 1998): with a certain gaze people and places that cannot be counted quantitatively literally do not count as a market. By looking at how quantitative measurements and notions of economic development figure in these decisions of who is and is not in a market, and the social and institutional constraints that people working in companies face when making decisions about markets, we can better understand what it is like to see like a company.
Applied anthropologists are often called upon to narrow the distance between consumer and producer. Economic anthropology, sociology and consumer culture theory have in various ways focused on how consumers and producers actively co-create the meaning of both objects and brands. Firms and their customers are always acting in some relationship to one another, often relying on shared cultural meanings. By asking questions about where markets are and where markets are not, we can also see how the distance between consumers and producers has its own social organization. It is not there simply because the two kinds of actors are distinct. It has its own configuration. The networks that otherwise tie producers and consumers together is also cut in certain ways (Strathern 1996). Not every and all connection between consumer and producer can be made.

In this case, the connections between producers and would-be consumers are cut by assumptions about which consumers are ‘ready’ for which technologies. The story will come as no surprise to anthropologists working in development. What might come as more of a surprise is the idea that parts of that network might be reassembled in different form. Simakova and Neyland (2008) show how information and communication technology (ICT) marketing works by creating and mobilizing constituencies around the creation of tellable stories about the value of new technologies. Securing a tellable story in the mess of constantly shifting actors and perpetually new products is difficult at best in the ICT industry. Indeed, it is a preoccupation amongst anthropologists in this industry (see also Cefkin 2010). Yet there are some tellable stories, like those about development, that do not shift so easily or quickly. In fact critics of development (Escobar, 1994; de Soto, 2003; Ferguson, 1994) point to a suspicious lack of uncertainty, where states of development become a too easily rendered just-so story about the triumph of Western industrialization as the only possible desirable end state for all countries.
Development discourse is persistent, even though there are many indications that it has overstayed its welcome. As I will detail below, the marketers and new product developers I work with are not unaware of problems with ‘development’. At minimum, they know that something is amiss when they land in an emerging market city like Shanghai to find there is little there that has yet to ‘emerge.’ They are keenly aware that people with low incomes in the global South do not appreciate producers talking down to them (Kuriyan, Nafus, and Mainwaring 2012). There are robust debates about whether “emerging” is even the right word for the profound changes in the geography of revenue generation. And yet, development remains a center of gravity, difficult to shake. There is something odd going on with development. It is both as securely dominant as ever, and yet simultaneously loudly contested. Development endures as a framing device, problematically immune to the endemic change that otherwise characterizes the technology industry. The role of measurement can give us a clue as to why its dominance has outlasted its convincingness.

My encounter with these issues came to a head in a project that created an alternative way of measuring technology adoption. I used this project to inform my firm’s prioritization of emerging markets, its strategies to engage those markets, and the design of technologies for first time computer buyers. My reflections will be grounded in this experience. The paper unfolds as follows. First takes a step back to look at the broader context of academic scholarship and practitioner reports that produce and sustain the West-centric assumptions that currently underlie marketing and new product development practices. Next, I show why the conflation of technology ‘readiness’ with economic development is so difficult to overcome, and how the use of quantitative measurement firmly entrenches them. I do this through the now unfashionable, but nevertheless serviceable, insight from Geertz (1973) that models of some phenomenon
quickly become models for it. A Geertzian view works particularly well in this case because indices are literally a mathematical “model of” that can easily be traced to prescriptions of various kinds. The chapter then turns to the consequences of this conflation. While there are empirically grounded associations between wealth and technology adoption, there are also significant constraints and economic costs associated with the assumption that they are one and the same thing. I then discuss the alternative we developed, the Technology Distribution Index (TDI), to overcome these business constraints while also making alternative social imaginations more possible. The measurement retains some of the dominant epistemic frameworks of a multinational firm, but it does not resort to West-centric assumptions about the development status of a country. I conclude by discussing the ways that this encounter with the quantitative loosens the connection between development as a discourse versus a daily practice.

[H2] The Business Contexts that Make Markets Emerge

Intel employs anthropologists within its R&D organization to provide insight into why and how products are likely to be used. While the use of anthropology to conduct user-driven innovation is now fairly commonplace in product development processes, MNCs continue to privilege standardized quantitative measurements (Flynn et al. 2009). Anthropologists and designers might arrive at a compelling design, but whether product managers believe the design is likely to win in the marketplace is in part a function of quantitative measurements. Clashes as well as corroborations can occur between the quantitative knowledge that suggests there is a scalable market and the qualitative knowledge that informed the product development in the first place.

These two issues of geography and the privileging of numbers come to a head when MNCs seek to develop products for emerging markets. Specifically, classifications such as
‘mature’ and ‘emerging’ markets, based on national income levels, are simple rules of thumb that focus product developers’ ideas of whom they are developing for, and simultaneously market strategists’ plans for which customers matter more, and how. These categorizations have descriptive merit: the market messages, design and distribution channels that would make a computer compelling in Bangladesh are not the same ones that would be compelling in the United States. Digital divide research confirms a strong association between technology diffusion and income (Caselli and Coleman, 2001; Dedrick, et al 2003; Kiiski and Pohjola, 2002). While the relation between wealth and technology clearly exists, the causality that underlies it has proved elusive to economists and policy scholars (Kolko, 2010; Taylor and Zhang, 2007; Lee and Brown, 2007; and De Ridder, 2007).

The social shaping of technology and science and technology studies (STS) literature (MacKenzie and Wajcman, 1999; Bijker and Law, 1994; Oudshoorn and Pinch, 2005) suggests good reasons for this elusiveness. The associations between wealth and technologies are the result of the mutual co-evolution between designers and users. ICTs are, by and large, made by middle class and wealthy people for the wealthy and middle classes. PCs were designed for offices, not agricultural communities. They were designed for individual use and were assumed to have an individual owner, even though much of the world does not use them that way (Pal et al., 2006). This is a historical process that made technologies by and for wealthy people, but it is still only a history, not an inevitable trajectory for all time.

While the social shaping of technology scholarship makes its way into large firms primarily through applied anthropologists, mainstream management and economics scholarship makes its way in, too, via consultants and participation in policymaking processes. Even this scholarship has also found the technology/wealth conflation more difficult to maintain, if for
totally different reasons. They find that when they expand their ideas about what technology is, and seek to account for and the breadth of information services that are available, the correlation between adoption and wealth becomes breaks down (Mahajan and Banga, 2006; Paltridge, 2008; de Laiglesia 2008). They find not just surprising rates of mobile phone adoption in poorer countries, but more innovation related to mobile phones (services, power supply, payment models, mobile banking, etc.). It is in these currents of mixed academic knowledge and practice where we find careful economists aware of that causality problems vex the wealth/ adoption relationship, and marketers and product developers who discuss innovation happening in poorer areas.

Despite the increasing tellability of stories that question the conflation of technology with developedness—tellable in the most mainstream of quarters rarely touched by anthropological critiques-- the wealth/technology association persists. Following the longstanding view of culture formation that culture takes shape when a model of some phenomenon becomes a prescriptive model for it (Geertz, 1973), we might start by asking what makes this conflation so powerful when so few find it satisfying. Notions of development, which sit at the core of the mature/emerging distinction, have a long troubled history. Ferguson (1994) shows that by claiming that non-Western parts of the world are in need of development, Western policymakers positioned themselves to treat countries that do not meet Western standards of wealth as if they were somehow childlike. They created a cultural logic that made it seem as if following the path of earlier industrialized countries were as natural and inevitable as the physical maturation of a person. In turn, the only possible debates to be had were what kinds of technology or education would best bring about development, not whether the West really was the best model for what other countries should aspire to, or whether endless wealth was really the best end state. In this
way, development is not a neutral description of change but a teleological one in which the West has set the terms of betterment.

The language and concepts available to think about new markets are linked to this history. At this multinational corporation and well beyond it, the BRICs (Brazil, Russia, India and China) were countries that were said to be emerging because they exhibited high rates of economic growth. They were not emerging because they had particular needs for certain kinds of technologies. Higher levels of disposable income do make purchasing products easier. But these high economic growth rates serve as indicators only, and what they indicated carried cultural meaning for the people I worked with that went far beyond this basic business logic. It carried a sense that consumers within BRICs could increasingly be assumed to be understandable from a Western, upper-middle class perspective even if product developers knew that people in those places were not entirely the same as them. What made citizens of BRIC countries emerge to people for whom they were previously invisible was the new wealth that made commonality imaginable. What was now in common was the consumption of mass manufactured commodities itself. This made it possible to believe that ‘they’ were now at some level ‘just like us,’ and therefore could be part of the stories people in the firm were prepared to tell each other about technology. This made them target markets for new technologies.

This dynamic is easiest to see concretely when the sense of commonality breaks down and things go awry. I attended a planning session to decide research and development (R&D) directions for a new generation of location-aware technologies. Under consideration was new ways of making use of the data generated by these technologies. A social scientist had suggested that there were lead users of a specific kind of GPS technology amongst an ethnic group in Cameroon. The group used the technology to mark trees of cultural significance to them,
enabling loggers to harvest around those trees and gain a sustainability certifications so that they
can sell on European markets (Lewis 2012). The researcher was pointing out that the location-
aware technologies could make new conversations possible between social groups. This turned
out to be an unthinkable idea when substantiated by the Cameroon example. The claim that this
was a leading use of technology was met with laughter, after which it was suggested, somewhat
sympathetically, that the example did not help to show the underlying power of the proposal.
Another person added that the example used to substantiate that there was a lead use should be
something that “scales.” GPS tagging for sustainable logging did not “scale.” Yet another
person asked for an example that was more “relatable.”

These were people who were otherwise supportive of the underlying concept, and shared
with the researcher the belief that there was value in sharing location data between different
kinds of groups. Indeed the negative response was intended to help this researcher ensure that it
made its way further along the product development process. Despite the Cameroon case being
well documented as a live, working example of use of location data for economic benefit, it
proved unhelpful in enabling the team to imagine future products. Instead, the researcher was
asked to re-present the otherwise compelling argument, but this time do so using “relatable”
examples that “scale.” In the end, he used a completely fictional scenario placed in the United
States to substantiate his case for the concept, and the team considered it more convincing than
the real one.

I would propose that there is a relationship between unrelatability, scale and development
that went unsaid in this discussion. It is difficult to believe that scale was the real problem in
any absolute sense, because there were less empirical grounds to believe the new, fictional
proposal was scalable. This was a group that was otherwise committed to empirically grounding
one’s arguments. Furthermore, the Cameroonian technology was already embedded in a large resource extraction industry. No one around the table knew enough about logging to say whether it could become a larger part of that trade or similar industries. The crossborder trade of which the Camaroonians were a part was discussed as if it did not exist or had nothing to do with “scale.” The interaction dissuaded the researcher from investigating numerically whether this technology use was scalable to other parts of the world, and what its potential profitability might be. For these reasons, scale could be interpreted not as a literal demand for higher profitability, but a vaguer social operation. “Scale” appeared to me to work as a cultural hinge that connects ‘lead users’ to some larger market that in turn included people sitting in the room. It appeared there had to be some imaginable relation between those sitting in the room and the technology users under discussion in order for those users to be seen as lead users—the harbinger of something much larger to come. That the proposed example “didn’t scale” betrayed the limits of imagination that people encounter when social difference cannot be elided. Nobody in the room was ever going to geotag information about whether the trees around them contained edible insects for foraging. It was hard to imagine those who did as leaders of a new market. The trope of emergence, with its connotations of visibility, cannot be coincidental in these circumstances.

The most likely marker of what made someone relatable was whether they could be thought of as “developed.” As the product was intended for “mainstream” markets, and not to “enable development,” the example did not fit the frameworks in play. In fact, I have witnessed other discussions about Intel’s role in developing technologies “for development” that were much more amenable to this sort of technical direction. If what we are talking about is mainstream markets, on the other hand, these are thought of in terms of their similarities, not differences. Possible differences amongst those who had development, whether between
American consumers or between American product developers and China’s middle class, were easily elided and went un QUESTIONED. For example, research to evaluate the merit of this or that device often takes place across (say) the United States, Germany and China precisely to ensure that any differences between them can be glossed. Rejection of the technology in one country could be a fluke, but rejection in a large country, or more than one, breaks the notion that there is a market for the thing at all. Such research strategies suggest an assumption that profitable markets are a mass, not an assembly of multitudes, and that emerging markets are those which are newly included in those masses whose similarities can be stretched and glossed, but not broken. Here, new wealth gave product developers just enough room to act as if BRIC consumers were similar enough to be targeted as a worldwide group with a ‘global’ orientation (Salmi, 2008), regardless of how slippery such appearances are (Mazzarella, 2003; Ong, 2006). That same ‘as if’ quality did not extend to others. In this example we can see how notions of markets as abstract entities, rather than actually existing exchanges between people, become important. In the context of producing new technologies, speaking about markets in ‘as if’ terms is par for the course, if not central. If a product is so new that it has never been transacted, the existence of a market for it is at best virtual. New markets are a model in its purest sense.

The issue is much wider than the discussions within one particular firm. For example, normative language is rampant in the recent attention to so-called ‘reverse’ innovation, where products are developed in the third world and diffuse to the first. The reverse innovation literature questions the necessity of high levels of wealth for innovation (Immelt et al, 2009; Hang et al, 2010). Indeed there is a good deal of enthusiasm for reverse innovation within the ICT industry. However, the term points to the wider beliefs about wealth that underlie it. That there is a ‘reversal’ assumes that innovation otherwise belongs to the first world, and diffuses
outward. It does not question what those roles are or how they came into being. How much ‘reverse’ innovation there has to be before people stop treating it as a reversal from the norm has yet to be seen. Similarly, through the controversial trope of the ‘bottom of the pyramid’ (Prahalad, 2004) reaching less wealthy customers has become important to technology firms. Yet this too presumes a well trodden norm where the producers and profit takers remain multinational firms.

Such loose language, so frequently wielded as to be unremarkable, is not simply uncareful speech, but reflects a widespread cultural model that has taken a historical association and rendered it predictive. What is remarkable about the model is the ability to maintain alternatives as anomalies rather than challenges. It does not deny alternatives, but renders them perpetual surprises when the association between wealth and technology turns out not to be an a priori necessity, as when Indian car manufacturers sell in the United States or when Ugandans buy mobile phones before they do refrigerators, or when mobile phone-based banking takes off in Kenya before anywhere else. These are not untellable stories. They hang together (Mol 2002) in some way, but in the face of the practical need to get a product to market (wherever that might be), they are encountered as bracketed off exceptions to the seemingly more practical (practicable?) rule of thumb that mass markets with wealth are the ones worth considering.

[H3] Quantitative Models Of and For

Not only are alternatives to the development/technology conflation treated as surprising anomalies, there are also ways that the conflation is embedded in day-to-day market activities. One way is with quantitative technology adoption indices. These indices embed the cultural model of what a developed country should look like into a quantitative model. They tidily
conflate Geertz’s ‘models of’ with ‘model for,’ and set them into operation. They are produced equally by public sector organizations seeking to develop countries with the aid of technology and the private sector looking for places to adopt them. So conflated are ‘models of’ and ‘models for’ that the public sector, private sector and academic measurements are hardly distinguishable from one another despite serving supposedly different goals (for a survey, see Vaezi and Bimar, 2009). One example is the Economist Intelligence Unit (EIU)’s E-Readiness Index. The EIU defines e-Readiness as:

[ext] a measure of the quality of a country’s ICT infrastructure and the ability of its consumers, businesses and governments to use ICT to their benefit. When a country uses ICT to conduct more of its activities, the economy can become more transparent and efficient. Our ranking allows governments to gauge the success of their technology initiatives against those of other countries. (EIU, 2009:3, my emphasis).[end ext]

Following the cultural model, the quantitative model treats technology as both a driver of development and an outcome. The EIU creates its measure through a weighted constellation of factors, which includes macroeconomic environment, literacy rates, ease of registering businesses, trade legislation and competition law, level of e-commerce use, ICT spending per capita, entrepreneurship rates, and broadband penetration. By EIU’s own admission (2009), the weightings were not derived from any scholarship that might pinpoint the strength of how these factors affect a highly nebulous concept like ‘readiness’ (see also Maugis et al., 2005), but simply asserted as a reasonable approximation. This gives us the unsurprising result that high scoring countries are ready to benefit from that which they already have. The E-Readiness report
goes on to note the remarkable gains made by emerging markets while retaining the OECD countries as top scorers. This is not remarkable at all, of course, but set by the terms of measurement.

Bundled indices such as E-Readiness affect market selection processes for many firms. While the EIU does not make any claims about causality, and cannot be judged in these terms, it does convert cultural assumption into a quantitative index, and in doing so both sustains and operationalizes a worldview. They sustain it in the sense that the outcome challenges no one: countries that increasingly bear some resemblance to OECD countries rise in rankings. They operationalize it in the sense that when firms make decisions about which emerging markets constitute priorities, those that fail to emerge onto EIU’s list, regardless of their affinity for this or that technology, cannot be seen. Precisely because indices circulate outside the firm, they create a broader, stable referent which people can use when proposing a new product or market. To violate the consensus, such as suggesting a country off the culturally validated list, is a lot to ask of a product manager when so much else about new technology markets is uncertain. This is so regardless of his or her personal attitudes toward development.

[H4] The Cost of Mature/Emerging Distinctions

While there is clearly a highly complex relationship between economic conditions and technology, when it becomes a starting point from which other arguments flow, it incurs significant economic costs beyond the usual anthropological criticisms. The first cost is that the distinction can distort the scale of opportunities. The mature/emerging distinction takes the country as the unit of analysis where it may not always be a useful proxy for how a market might scale. Data are designed so that countries can be said to have a priori characteristics, such as
GDP growth, FDI, broadband availability, etc.. They can be convincingly analyzed as a unit regardless of whether they act as such. In politically fragmented and socially heterogeneous places like India, they do not. Indeed, the Cameroonians mentioned earlier were quite obviously only a subset of all the people in Cameroon, which may have contributed to the sense that their practices were not scalable. The paucity of regional or city-level statistics, as well as geographically disbursed ethnic groups, creates strained ways of conceptualizing technology adoption, such that some countries are seemingly stuck in a perpetual state of ‘emergingness’ even when they are at the same time considered hotbets of technical innovation.

While the inadequacies of data are not something we were able to change, what we can change is the cost paid in terms of the product opportunities missed simply because countries were not perceived to be ready for them. For example, the rapid growth of the African phone market appears surprising to the product developers I worked with because much of the continent appears to lack the infrastructures and economic forms that have supported the growth of earlier technologies in industrialized nations. Once this adoption became undeniable, the cultural model kept it as an anomaly. I heard repeated comments that of course mobile phones have taken off in emerging markets, as building the network is so much less expensive. Yet the commonplace understanding within both the private sector and amongst development agencies is that Africa is not investable because of its political instability and the supposed lack of demand for anything more than basic needs (Konkel and Heeks, 2009). The levels of political stability in Africa have not significantly changed in time to be ‘ready’ for mobile phones (Heeks, 2009), and ‘unaffordable’ handsets are widely purchased. By aggregating factors believed to be conducive to technology adoption in a more general way, indices make it hard to see the
technology adoption that is in fact possible. It is through numerical indices of readiness that the case of mobile phones in Africa appears more of an anomaly than it actually is.

These are both high costs to pay. At Intel, the constraints set by these measurements became pressing. Its business had been diversifying to include more kinds of computer hardware, and as part of that diversification it launched a computer designed specifically for classrooms in emerging markets. These were not technologies targeted to the new wealthy within emerging markets, but were designed for those with more serious economic constraints. With a social mission to help build local economies, and goal of keeping costs low, tracking rising disposable income levels would provide little in the way of guidance. There Countries that had the traditional neoliberal package as embodied in e-Readiness measures would not necessarily make ideal sites for pilot programs and early sales. What constituted an emerging market for this product, then, could no longer be elided as part of a pre-conceived mass market. As this was an entirely new class of product, and no money had changed hands, how to measure this market was a non-trivial problem.

[H5] The Technology Distribution Index

I worked with colleague Ken Anderson and Dr. Phil Howard, a University of Washington political scientist, to develop a measurement that got beyond the mature/emerging dyad. We set out to identify a set of countries that had relatively high technology adoption rates but did not necessarily rank highly in terms of development indicators. The result was the Technology Distribution Index (TDI). Further details of the measure are found in Howard, et al (2009). I offer a brief summary here. The TDI is a calibrated measure that allows us to relate a country’s share of the global stock of a particular technology to its share of global GDP dollars. This measure, which can be applied to any technology, allows us to say whether the country has
higher, lower or a middling amount of technologies for its level of economic capacity. This helps identify countries where political and social factors have brought ICTs more rapidly than might have otherwise been expected as a function of economic development alone.

This index is created through a ratio of two ratios. First, we calculated a ratio of a country’s economic output to the output of all countries in a given year. Then we calculated a ratio of a country’s technology use to the technology use of all countries in a given year. The ratio of these two ratios reveals whether the proportion of ICTs is in some balance with economic productivity. A natural log is taken to balance the scale as a distance from zero so that, unlike technology adoption per dollar of GDP, the TDI does not suffer from ceiling or floor effects.

Figure X.1: Technology Distribution Index value calculation

The reader will have guessed by now that the translation of the empirical problem into mathematical form was entirely Dr. Howard’s work. Nevertheless, through close collaboration with him (and generous patience on his part), I too have been able to use the method to calculate scores for various technologies. The experience was roughly analogous to conducting field research in a new place: it changes a person, but not in ways that force her to hand back her anthropology degree. Regardless of one’s affinity for math, we can see the difference measurement makes by visualizing the data as a global map. Figure 2 shows the penetration of various technologies. It shows a clear pattern of concentrated adoption in the OECD countries, though more weakly for mobile phones. The TDI creates a more complicated picture (Figure 3).
It is only possible to pick out individual country scores through the color image (which can be found at http://www-958.ibm.com/software/analytics/manyeyes/visualizations/technology-distribution-index-vari). However, even in grayscale it is still possible to see that the overall pattern is broken up, and emerging market powerhouses like India and China are largely in the middle of the pack. The sensitivity of technology adoption to cost is clear in the color version. Fixed broadband is expensive, and its subscribers are concentrated in wealthy countries, but the world’s Internet users are more evenly scattered, suggesting shared use is important in making the Internet accessible. The exceptional mobile phone adoption in Russia still translates into a high score in the TDI, but not as much. This suggests that some of the growth in mobile phone ownership is explained by rising incomes, while some is explained by other factors such as consumer affinity, social structures that enable adoption, etc.. Conversely, Kenya scores three times as much in mobile phone adoption under the TDI. This means that in Kenya adoption is much more strongly explained by factors other than rising economic wealth compared to Russia.

Figure X.2. Technology Ownership/Use per 100 Inhabitants, Various Technologies.

Number of technologies specified above per 100 inhabitants. In the case of Internet users, the population of active internet users was used, regardless of whether the user owned a PC or method of access. Data source: ITU, 2008. Visualization created on IBM Many Eyes. See http://www-958.ibm.com/software/analytics/manyeyes/visualizations/technology-per-100-inhabitants for interactive, full color map.

Figure x.2 About here
The data may serve multiple purposes. A firm looking for a single market to pilot a new product and establish its credibility as a concept might wish to pick a country with historically high scores across multiple product categories in order to minimize the risk of unanticipated barriers to adoption. The TDI does not assume to know what constitutes a barrier, but if multiple technologies are succeeding despite low incomes, we can surmise for practical purposes there are few. A firm can also use it to identify places where it has had relative success with its technologies, but where that success was hidden in other measurements. A strategy for scaling products globally can be arrived at through more careful observation of adoption patterns as measured in this way. Because the scores are not aggregated overall, marketers can draw conclusions about the adoption of technologies not yet on the market based on similarities and differences with previous technologies without resorting to notions of developedness. For example, a country with a surprisingly high rate of internet users but a low rate of broadband
subscribers might mean there is demand for a new connectivity solution, not a naiveté about what the internet is and does. Indeed, at Intel the TDI has been used in all of these ways for various emerging markets projects.

[H6] Conclusion: Making a Different Market Emerge

There are threads that make the TDI traceable back to development discourse. It did, after all, incorporate GDP figures, but created a different relationship to those figures so that they do not control the ultimate assessment. The network that connected GDP to technology adoption was cut differently, although the actors remained the same. At least in this iteration, the TDI also did not challenge the notion of countries as sites of adoption. We remained constrained by the available data, which were from secondary sources that did take countries to be an appropriate unit of analysis. The firm, for that matter, was organized as if countries were the sites of adoption, and in this way this empirical liability became an organizational asset. Nevertheless, in the ways outlined above, we made new markets emerge.

The ease with which Intel adopted the TDI, compared with the difficulty of explaining why ethnic minority groups in Cameroon are a perfectly reasonable place to start a new product development discussion, is telling. In practice, development was a notion relatively easy to dispose of provided other dominant frameworks were maintained, such as scalability as connections and similarities between identified countries. In sharing it with my colleagues around the company, I had relatively little convincing or cajoling work to do. The main communication work was to explain the merits of a relative measure, rather than an absolute measure. The numbers that the method produces are abstract distances from zero. They are not felt in the way that claims of so many billions of dollars are felt, though when I worked with
them I did develop an intimacy with them, and a visceral feel for what “-2.7” would mean. Still, explaining this did not encounter difficulties, and the measurement was used in many parts of the company. The relatively easy adoption of the TDI cannot be explained by the mere economic incentive to make use of it. Maintaining the fiction that markets emerge solely as a function of rising incomes was quite costly, yet maintained nevertheless.

Returning to the notion of the tellable story, I would argue that a tellable story must be augmented by other resources that set them into practice. The TDI does not produce a tellable story: it does not say what factors make for high levels of technology adoption, only that there is a measurable remainder after the effects of income are taken into account. It is not a discursive move, but the root cause of the problem was also not discourse per se, but the entanglement of discourse with measurement that made some markets inconceivable. Instead, the TDI creates a non-discursive frame that relieves actors of the need to tell a certain kind of story. The TDI opened up the possibility shift the focus in practice without challenging head on the supposed consensus other measurements represent. In market selection discussions that involved the TDI, states of development was usually not discussed. These conversations instead focused on the technologies that had been adopted, and what that configuration said about the presence or absence of enabling factors without naming what those were. Just as critiques of development had been known but set aside when it came to the practice of market assessments, here it is development that is set aside.

The consensus that development was necessary for technology adoption had already begun to unravel—the TDI would not have been a good way to start that undoing. We instead shifted register from the discursive to the non-discursive in order to reconfigured connections between producers and consumers. We did it by examining which parts of the network had been
hanging on too long while other parts of it had started to unravel. This suggests a more complex role for numbers. They are not just embodiments of dominant discourse. Instead, numbers can be designed to point to alternatives, and open up the context in which other kinds of stories might be told. Here, we did this by designing a number that performed its partialities as well as its claims. The TDI points to what it cannot explain, and cannot be explained in traditional models. It gives a limited sense that there is something interesting going on in a particular country for which we do not have a model and might not need one. It not attempt to explain everything away, but shows what that remains when the dominant frame is taken away.

In a context where development was both peculiarly persistent, yet increasingly questioned, treating numbers as active participants in the making of markets did some work. It alleviated the need for rules of thumb that have overstayed their welcome. The politics of doing so will not be to everyone’s taste. The TDI is unsatisfying as a form of critique. The TDI remains silent on matters many academic anthropologists would prefer to tackle as an extended deconstruction of ways that global markets reproduce a neocolonial impulse. Instead, the politics of the TDI is that of partial connections. It is a partial rearrangement of the connections between people and calculations—a rearrangement which widens the frame of how ‘good’ markets can come into existence. In doing so, it requires an ethnographic sensitivity to not just the anthropologically objectionable assumptions that traditional measures make, but also requires a sensitivity to numbers as entangled, fraught social entities. Perhaps an engaged anthropology requires not just a theory of development, but a theory of numbers as well.

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References


