



FIVE SUCCESS FACTORS FOR TECHNOLOGY DISTRIBUTION AND ADOPTION IN THE LAST MILE



JUNE 2014

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In recent years the field of international development has seen an inspiring surge of simple, innovative technologies designed to improve the lives of the poor. Social enterprises, research institutions, and transnational corporations – as well as creative partnerships between them – are making breakthroughs in developing affordable solar lanterns, water filters, fuel-efficient cookstoves, and ICT-based innovations.

Yet despite the progress and promise of these life-changing technologies, we are far from seeing their benefits realised in the communities that need them the most, at the scale we aspire to create change. This is because creating products is only a part of the challenge; delivering technology to the last mile, catering to communities' needs, and ensuring adoption are the keys to poverty alleviation on the ground. In other words, from a design discipline perspective, technology for development must go beyond product design and encompass service design that is anchored in the user experience.

Kopernik, a nonprofit based out of Indonesia, was created precisely to respond to this gap between available solutions and communities in need. In its first four years, Kopernik has successfully delivered life-changing technologies to over 190,000 people in 19 countries by partnering with technology producers, donors and local community organisations with a shared interest in serving the last mile.

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Loosely defined, the ‘last mile’ refers to areas that are difficult to serve, due to their remote location, poor transportation infrastructure, and high cost to reach them. In Indonesia, places like East Flores and Papua are perfect examples of the last mile, where the average income is below US\$1.25 per day and poor roads isolate villages from the nearest port cities.

High transportation costs exacerbate poverty, as last mile customers must pay more than city-dwellers for basic commodities like fuel and rice, even when these products are often of a lower quality.



In implementing more than 100 projects connecting simple technology with those most in need, Kopernik has learned a number of important – and sometimes surprising lessons. These lessons have been consolidated into five key factors for success that Kopernik uses as guiding principles in its projects today.

FACTOR ONE:

ACTIVATING A LOCAL NETWORK OF TRUST

In introducing new technology, a stranger to a community achieves very little. Kopernik learned this the hard way when it attempted to sell solar lanterns, water filters, and other useful technologies at a night market in a village in Bali, Indonesia, close to Kopernik's head office. The idea was to set up a Kopernik stall at a local market which sells everything from cooked food to groceries to household items. The idea flopped, however. Night after night, people came to the stall, showed interest in the products, and asked questions about their use, but not a single product was sold in two weeks. In contrast to this approach, Kopernik was able to sell on a slow but consistent basis through friends and acquaintances outside of the night market.

The key difference between the two approaches lay in the level of trust: Kopernik was not a trusted entity at the night market, while word-of-mouth sales rely on credible relationships.

This lesson on trust becomes even more important when reaching remote villages where the social fabric is traditionally tight and strangers stand out. Understanding this social dynamic, Kopernik identifies organisations that have existing networks in the local area and works closely with them.

Such entities can range from non-profit organisations, cooperatives, savings and loans groups, schools, churches, to even mum-and-pop shops.

The type of partner organisation depends on the local context. For example, in a women’s empowerment initiative in East Java, Kopernik and a local non-government organisation helped form small women’s groups to sell water filters and fuel-efficient stoves in their communities. Through tailor-made trainings, the women’s groups were able to earn consistent revenue and eventually came together to establish an independent business cooperative. In another location, on the Mentawai Islands of West Sumatra, Kopernik collaborates with a small kiosk willing to serve as a retailer of life-changing technologies, rather than trying to create a distribution mechanism from scratch. This is effective not only in reaching potential users, but also in ensuring the sustainability of operations.

FACTOR TWO:
**LOWERING
FINANCIAL
BARRIERS**

In addition to activating a trusted network on the ground, lowering financial barriers is a critical issue in delivering and catering to consumers in the last mile.

Families relying on subsistence and semi-subsistence farming and fishing are highly price sensitive given their low cash income. Based on dozens of needs and impact assessments conducted, Kopernik has learned that willingness to purchase new technology is highly dependent on the offered price, even if a product has clear economic benefits. Given this consumer reality, Kopernik and its partners try to price products at or close to the willingness to pay point as much as possible to make products affordable for the people who need them the most.

In some contexts such as the East Java case mentioned above, this approach involves using philanthropic money in the form of subsidies to reach the last mile. The subsidies, however, aren’t one-off benefits; the money raised from selling the technologies is reinvested in further technology projects, similar to the mechanism of revolving microfinance funds. Over the course of several projects, the subsidy level is slowly decreased until the products are sold at retail price.

Lowering financial barriers not only involves setting appropriate prices, but also requires flexible payment options. Microfinance is one possible solution to improving the poor’s access to financial instruments, but it is not the only answer. Besides, the penetration of microfinance in many of the countries where Kopernik operates is quite low: in Indonesia, only three percent of the total population and 20 percent of the poor are microfinance borrowers according to 2008 data from Microfinance Information Exchange. Thus, there is a need to go beyond microfinance and utilise existing financial practices such as instalment payments and pooled funds by local cooperatives. Kopernik allows instalment payments in most projects and surveys local practices in the project planning phase to tap into existing platforms. In addition, Kopernik is strengthening partnerships with multiple cooperatives in Indonesia to better leverage their role in delivering innovative technologies to the last mile.



FACTOR THREE:

RIDING THE TECHNOLOGY ADOPTION WAVE

In addition to approaching last mile communities through a trusted network with lowered financial barriers, Kopernik has learned that technology adoption takes time. It travels through a community like a rippling wave beginning with a minority of curious users, slowly reaching those in the periphery. This concept is similar to ‘diffusion centrality’, a measure of social influence, which MIT development economists Abhijit Banerjee and Esther Duflo coined to explain the spread of microfinance programs in rural India.

“Technology adoption does not happen through a one-off, dissipating wave; a gentle yet persistent effort needs to be sustained to convince people of the benefits of the technologies and the trustworthiness of the technology promoters.”

These efforts are almost all below-the-line marketing, given the lack of infrastructure to carry out above-the-line marketing in the last mile.

There is a well-known distribution curve in the area of technology marketing that segments a bell-shaped curve into innovators, early adopters, early majority, late majority, and laggards.

The theory behind this curve is that once a critical mass of innovators and early adopters become favorable consumers of a product, the early and late majorities as well as the laggards naturally follow suit ensuring widespread adoption. Based on Kopernik’s experiences, this theory also holds true in last mile communities.

Putting this theory into practice, the first activity Kopernik and its partners conduct in new communities is a ‘tech fair’ that introduces a panel of innovative technologies to people and collects feedback to work out which technologies are most in demand. Tech fairs give potential buyers the opportunity to examine and test the products and ask questions about the benefits of using the technologies.

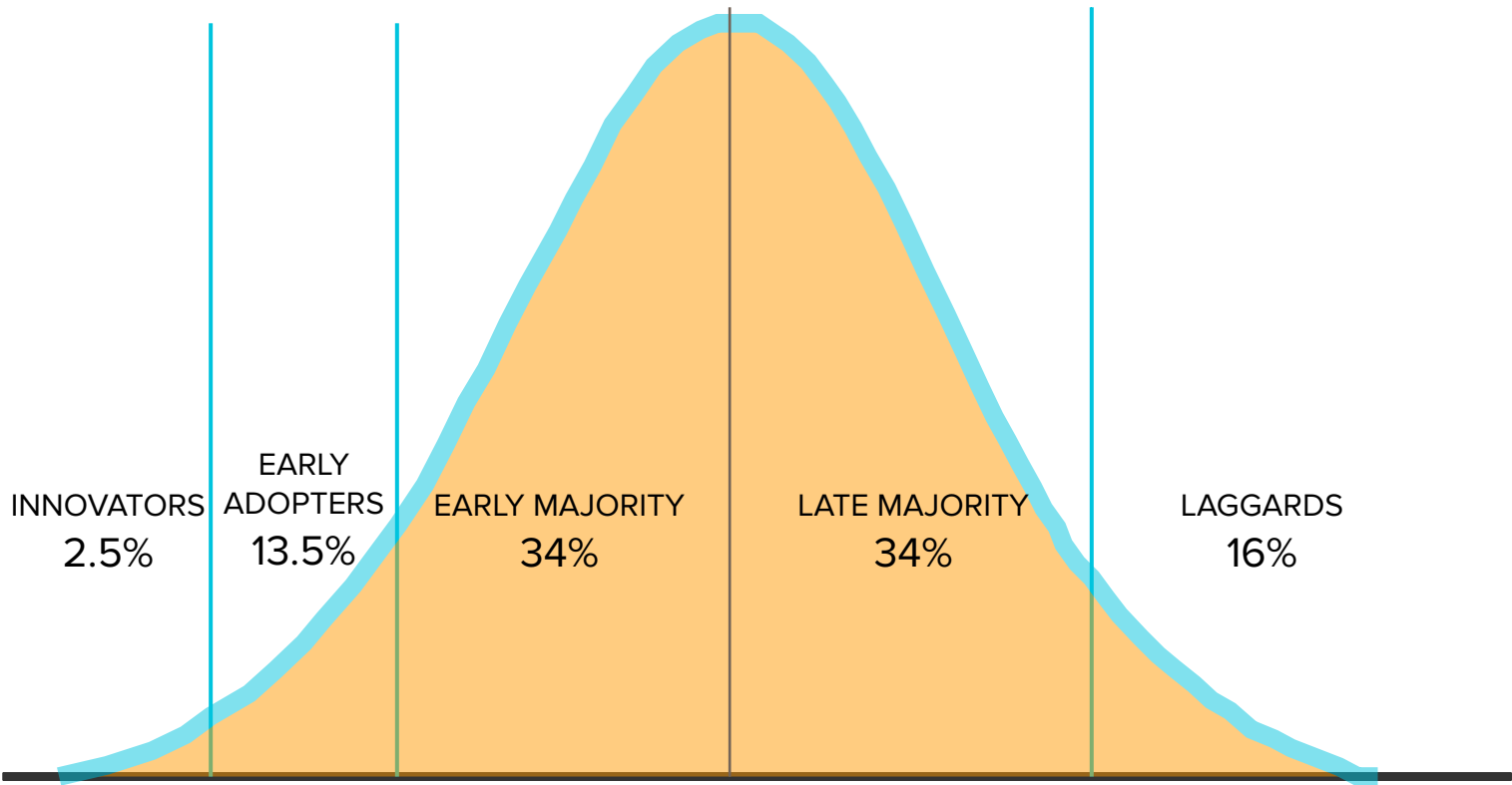
Therefore, this process attempts to identify the innovators and early adopters and pique their interests. The tech fairs will be followed up by village meetings and household visits to ensure that the critical mass of the distribution curve is reached over time, and eventually economies of scale in the more mature parts of the technology adoption cycle are achieved.

In a community in West Nusa Tenggara, Indonesia, one woman skillfully implemented such an approach. Ibu Nur’aini became an independent seller of water filters after participating in technology agent training offered by Kopernik and a local partner. Her secret to success was in quickly finding a niche among consumers. She targeted well-connected people in her community such as office managers and kiosk shop owners who are in contact with many people through their jobs.

These people had a relatively higher level of education and immediately recognized the health benefits and money savings offered by the water filter. They would set up the water filter in an office or food kiosk, where employees and customers could see the water filter and start to think about using one in their own households. When they asked the office manager or the kiosk owner about the product and where they got it from, they would be referred back to Ibu Nur’aini, who always left her mobile phone number with every customer to ensure that early adopters would refer later market segments to her.

Kopernik has also seen a similar example with fuel-efficient cookstoves in a different part of West Nusa Tenggara. In this project, a local partner recruited and trained women as technology agents, earning a commission on every stove they sold. The women in this community visit each other’s homes at the break of dawn, just in time to boil water or cook breakfast. Given this traditional practice, the more strategic technology agents took the stoves with them and demonstrated the product when they met in the morning. The effective spread of technology in this community was driven by smart peer-to-peer communication and demonstration.

The two examples above are successful starts to riding the technology adoption curve. A steady effort is needed to convince one segment at a time, even if a product is designed well and its benefits are evident to users. Kopernik has also learned that, despite the general theory of technology adoption, no two communities are the same, and each may require a somewhat tailored approach.



TECHNOLOGY ADOPTION PROCESS



FACTOR FOUR:

FOCUSING ON TANGIBLE BENEFITS

Many of the simple, life-changing technologies available in the market bring benefits on multiple levels to users. Solar lanterns, for example, not only leapfrog the need for electricity, but are also cheaper in the long run and are safer than kerosene lamps. Similarly, water filters not only offer health benefits to households, but are time- and cost-saving compared to collecting or buying firewood for boiling water. Clean cookstoves achieve an amazing triple effect on environmental, health, and economic outcomes. This is what makes these products truly innovative.

In marketing these products, however, Kopernik has learned that the most tangible benefits need to be most strongly communicated. Tangible benefits often mean monetary benefits for people living in poverty in the last mile. This realistic consumer orientation may not necessarily be in line with the donor's or local partner's perspective, which could label the project as an 'energy' or 'environmental' initiative for promotion of solar lanterns, or a 'water and sanitation' project for distribution of water filters. Of course, the environmental and health outcomes should not be downplayed or neglected in communicating social impact, but an argument in reducing economic burden is essential in convincing consumers in the last mile.

But tangible benefits can take different forms depending on the context. For example, demonstrating to potential users how dirty, cloudy water becomes clear and purified as it passes through a water filter. But in a project in East Java, the key was going beyond this point. Water filters were sold and adopted widely in this last mile community because an idea to sell ice using filtered water became part of the sales pitch.

The idea was well received as a new business opportunity by small shop owners with freezers. In another example from Madhya Pradesh, India, the marketing tactic that nudged villagers to buy fuel-efficient stoves involved demonstrating how the new stove cooked a local bread, chapati, faster than traditional, three-stone cookstoves that produce dangerous smoke. Oftentimes, a single, simple, tangible message is more powerful than trying to communicate multiple, abstract messages at once.



FACTOR FIVE:

STAYING ENGAGED,
SHOWING COMMITMENT



The final factor in delivering and ensuring technology adoption in the last mile is to demonstrate commitment through continued engagement. This factor is a culmination of all the preceding ingredients as it involves sustaining earned trust (factor one), keeping the financial barriers low (factor two), ensuring the last segments are reached in the adoption curve (factor three), and user-centered benefits do not lose focus (factor four). Whether it be through local partners or on its own, Kopernik ensures the target communities gain access to technologies and continue to have access to them despite the geographical distances.

For instance, in the earlier case of a women’s empowerment initiative in East Java, the local partner organization, Farabi, followed up with fledgling women’s groups every month through household visits and phone calls to support the continued operation of the groups and to identify any training needs. Farabi’s tailor-made trainings helped the women’s groups to earn consistent revenue from selling water filters and to eventually come together to establish an independent business cooperative.

Another way to ensure sustainability is to train local people in last mile communities who can help others with maintenance of technologies, i.e. ‘training of trainers’ to use an international development term. In a remote community in East Nusa Tenggara, Kopernik’s local partner did exactly this while promoting local sales of fuel-efficient stoves, water filters and solar lanterns. Empowering local people with simple maintenance techniques resulted in a much higher sales volume compared to similar communities that did not have the same maintenance training.

Kopernik is currently undertaking a major initiative to connect local mom-and-pop shops and simple, life-changing technologies to tap into the shops’ local distribution and presence. By training the owners of small shops in basic after-sales services for the products, remote consumers can find comfort in the fact that their purchase is not the end of the interactions with product developers and distributors, but only a half-way point in the engagement continuum. Kopernik has partnerships with 50 such shops throughout Indonesia and plans to scale up the network to 350 in the next three years.

PUTTING FIVE FACTORS
INTO PRACTICE

Kopernik has learned that these five factors are indispensable in ensuring innovative technologies reach and benefit consumers in the last mile. Remove any one of them, and uptake by end-users becomes limited. The inspiring surge of innovative technologies in recent years needs to be matched with equally creative ways to deliver them to the last mile. Kopernik hopes to see more distribution success stories shared, so that financially sustainable supply chains can be scaled up, to the benefit of technology producers, distributors, and last-mile consumers alike.



Graphic Layout: Tracy Zisiga Makulu
Photos pages 1, 3, 5, 6: Willow Paule Photography