



SPROXIL



CONTINENT

Asia



COUNTRY

India



HEALTH FOCUS

General, Malaria



AREAS OF INTEREST

Digital technology



HEALTH SYSTEM FOCUS

Medical products and technologies

SPROXIL, INTERNATIONAL

Sproxil has combined a unique labelling system with digital technology to identify counterfeit and spurious medicines at the point of purchase, protecting more than 12 million consumers in the Global South.

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ABBREVIATIONS

DFID	Department for International Development (UK)
DGFT	Directorate General of Foreign Trade (India)
FMCG	Fast-moving consumer goods
GSK	GlaxoSmithKline
HDIF	Human Development Innovation Fund (UK)
HIV	Human immunodeficiency virus
MPA	Mobile Product Authentication™
NAFDAC	National Agency for Food and Drug Administration and Control (Nigeria)
NPPA	National Pharmaceutical Pricing Authority (India)
PIN	Personal identification number
QR	Quick response
RFID	Radio frequency identification
SSFFC	Substandard, spurious, falsely labelled, falsified and counterfeit
TB	Tuberculosis
US	United States
WHO	World Health Organization

CASE INTRODUCTION

Substandard, spurious, falsely labelled, falsified and counterfeit (SSFFC) medical products pose a major public health risk, and include medicines, vaccines and diagnostics. They can harm patients and undermine confidence in medical products, health-care providers and health systems, as well as exacerbating drug-resistant strains of infectious diseases (World Health Organization, 2016a). On average, 10% of the drugs worldwide and 25% of the drugs in less developed countries are estimated to be counterfeit (Chika et al., 2011). In these countries, the most common counterfeit drugs are those for infectious diseases, such as tuberculosis (TB) and malaria. Counterfeit antimalarial and antituberculosis drugs are thought to cause up to 700 000 deaths annually across the globe.

Sproxil, Inc has developed a technology-based solution for counterfeit medication that combines mobile phone use with simple, low-cost product labels. Mobile Product Authentication™ (MPA) empowers individual consumers to validate the authenticity of the medication they are about to purchase. Consumers locate a label on the medication package which, when scratched, reveals a unique PIN code. Consumers then verify the code for free via a text/call. If the code is fraudulent, consumers are connected with a help line that collects further information and facilitates follow-up from local authorities responsible for tracking and eliminating counterfeiting activities. While the customer interface is simple, eliminating the requirement of expensive equipment or complicated training and accommodating the needs of most people in low-resource settings, the accompanying back-end data analysis and business model is sophisticated. The back-end analysis allows for the derivation of data-driven insights on counterfeit activities as well as

consumer patterns; the business model uses these data insights to attract stakeholders who have the power to reduce counterfeiting, such as governmental regulators and manufacturers of legitimate pharmaceuticals. By collaborating with drug manufacturers, whose market presence is endangered by counterfeit products, Sproxil helps protect manufacturers' brands, and subsequently profits. Government authorities can use the data acquired through Sproxil's solution to identify sources of counterfeit medication and bring perpetrators to justice. In general, the manufacturers cover the cost of the service; it is free for the consumer.

Since its creation in 2009 in the United States (US), Sproxil has implemented its solution in multiple countries, including Nigeria, Kenya, Ghana, India and Pakistan, and to diverse industries, including agrochemicals and fast-moving consumer goods (FMCG). This quickly scalable model has allowed the young company not only to turn profitable in five years, but also to access markets in need of solutions to drug counterfeit challenges. It is this symbiotic mix of business and social purpose that drives the organization towards becoming the enabler for millions of consumers worldwide to access reliable products such as medication for infectious diseases. This case study demonstrates how private, for-profit companies can play a valuable role in generating and implementing solutions to public health challenges.

We'll be tagged in a Twitter update that has a picture of a medicine... in Nigeria saying: 'We've just bought prenatal vitamins, and they were Sproxil protected... thank you!' (Jennifer Campos, Service Innovation Manager, Sproxil)

1. INNOVATION AT A GLANCE

Organization Details

Organization name	Sproxil, Inc (Sproxil)
Founding year	2009
Founder's name (nationality)	Ashifi Gogo (Ghana, United States)
Current head of organization	Ashifi Gogo
Organizational structure	For-profit company

Innovation Value

Value proposition	A unique labelling system combined with digital technology to identify counterfeit medication at the point of purchase. The simple user interface is supported by complex back-end system generating valuable insights on counterfeit activities and consumer patterns. The service creates shared value for legitimate drug manufacturers, local regulators and end consumers, within a financially sustainable framework.
Beneficiaries	Sproxil's solution has a diverse set of beneficiaries, including individual consumers, government authorities (regulators, tax and revenue authorities etc.), and businesses.
Key components	<ul style="list-style-type: none"> • 'Mobile Product Authentication' (MPA) with a simple user interface accessible for consumers in low-resource settings. • Shared value service model that brings together the financial power of pharmaceutical companies, the regulatory power of authorities, and the interest of the customer who suffers the harms of counterfeit medication. • Timely information sent to companies and regulators following identification of counterfeit products through the MPA system. • Evolving market analytics service to maintain existing and attract new business clients.

Operational Details

Main income streams	Revenue is the primary source of income; grants supplement as a secondary income stream.
Annual expenditure	Confidential
Cost per person served	Manufacturers paying for protection against counterfeiting cover the cost; the solution is free for the end consumer who buys medication.

Scale and Transferability

Scope of operations	Technology research and development in the US with subsidiaries in other countries covering sales and operations; currently covering a range of industries, particularly pharmaceuticals, but also including beauty and personal care, FMCG, electrical goods, automotive, oil & gas, and agribusiness, across Nigeria, Ghana, Kenya, Tanzania, India, Pakistan, and the US. This case study focuses on the pharmaceutical industry.
Local engagement	Varies by country and industry. For example, support by the National Agency for Food and Drug Administration and Control (NAFDAC) in Nigeria has insured broad roll out of intervention and collaboration with local authorities to eliminate counterfeiting.

Scalability	Solution is applicable to a wide range of industries; Key components to Sproxil's scalability are: 1) high mobile phone penetration and reliable telecommunications networks; 2) companies requiring brand protection; 3) consumers aware of both the dangers of counterfeit products; and 4) governmental/ regulatory support or alignment. Regulatory support is important for the pharmaceutical industry especially (e.g. NAFDAC mandate in Nigeria has enabled collaboration with regulators pursuing counterfeiters, whereas in countries without a mandate like India, accessing the pharmaceutical market has been more difficult).
Sustainability	Diversified revenue model: <ul style="list-style-type: none"> • business clients paying for counterfeit protection service (labels); • business clients paying for data analytics service; • and advertising services; Consumer awareness programmes to cultivate demand.

2. CHALLENGES

Substandard, spurious, falsely labelled, falsified and counterfeit (SSFFC) medical products pose a major public health risk, and include medicines, vaccines and diagnostics. They can harm patients and undermine confidence in medical products, health-care providers and health systems (World Health Organization, 2016a). On average, 10% of the drugs worldwide and 25% of the drugs in less developed countries are estimated to be counterfeit (Chika et al., 2011). This is especially likely where point-of-sale occurs in street markets where vendors have no reputation to protect (Harris, Stevens & Morris, 2009). The full scale of the problem is difficult to assess as many counterfeit activities remain undetected, and most member states of the WHO fail to report the levels of counterfeiting taking place in their countries (Newton et al., 2006a; WHO, 2009).

Many types of drugs are subject to counterfeiting, including antibiotics, endocrine drugs and anticancer agents (WHO, 2009). In most countries in the Global South, the most common counterfeit drugs are those for infectious diseases, particularly those for TB and malaria (Newton et al., 2006a, Newton et al., 2006b, Dondorp et al., 2004; Atemnkeng, De Cock & Plaizier-Vercammen, 2007). A Lancet study from 2012 found that 36% of the antimalarials in Southeast Asia and 20% of the antimalarials in Sub-Saharan Africa were falsified (Nayyar et al., 2012). Similarly, 16.6% of the antituberculosis drugs across several African countries and 10.1% of the antituberculosis drugs

in India were found to lack required levels of active pharmaceutical ingredients (Bate et al., 2013).

The negative impact of counterfeit drugs on societies is devastating, as listed in a report by the International Policy Network (Harris, Stevens & Morris, 2009). These drugs pose three main direct threats to patients. Firstly, counterfeit drugs typically contain insufficient active pharmaceutical ingredients and fail to provide effective treatment, which leaves diseases untreated and can lead to death. Harris, Stevens & Morris (2009) estimate that approximately 700 000 deaths worldwide from malaria and tuberculosis are attributable to fake drugs. In Sub-Saharan Africa alone, 96 000 deaths of children under the age of five are thought to be from counterfeit antimalarials (Yadav, 2014). Secondly, these drugs sometimes contain added toxic chemicals that can lead to injury or death. Of SSFFC medical products reported to the Global Surveillance and Monitoring System, 10% are associated with toxic reactions – from skin rashes to hospitalizations and fatalities (WHO, 2016b). Thirdly, drugs may contain some active ingredient but too little to kill all the disease agents, which can contribute to the emergence of drug resistant strains of diseases such as human immunodeficiency virus (HIV), TB and malaria (Harris, Stevens & Morris, 2009).

Globalization of the pharmaceutical and medical product market means that products are often manufactured in one part of the world, packaged

in another and supplied to a third. This requires inter-regional surveillance and monitoring systems to protect patients and health systems worldwide (WHO, 2016c). Countries in the Global South are not only victims of counterfeit drugs, but are also some of its biggest producers (Roger & Boateng, 2007). Some 75% of the counterfeit drugs worldwide are estimated to have Indian origins (Raufu, 2003).

Current approaches to address the threat of SSFFC medical products are multifaceted and include efforts such as multinational and government interventions, the establishment of new drug regulatory bodies, identity preservation techniques and quality evaluation technologies (Harris, Stevens & Morris, 2009). For example, the Nigerian government has focused its efforts on increasing counterfeit detection and seizure activities, which has led to a drop in the volumes of such medications of 41% in 2002, 16.7% in 2006 and 10% as of 2011 (Akunyili, 2007; Ubajaka, 2016). Governments such as India and China have instituted more severe criminal sanctions, which have been criticized for pushing counterfeiting activities to organized criminal groups and incentivizing the development of corrupt relationships with law enforcement agencies (Harris, Stevens & Morris, 2009). Similarly, the bureaucratic drug approval process in South Africa (reported to take up to two years) has been criticised for creating gaps in the supply chain which are exploited by counterfeiters (Harris, Stevens & Morris, 2009).

Interpol runs national and regional operations to disrupt transnational criminal networks involved in pharmaceutical crime. Recent success includes the completion of operation Pangea VIII, which operated in 115 countries in June 2015, and resulted in a record 20.7 million fake and illicit medicines seized and over 2 410 websites taken offline (Interpol, 2016). The World Health Organization (WHO) also oversees several initiatives to address SSFFC medical products, such as the Member State Mechanism, which was established in 2012 to address the issue of SSFFC medical products and which focuses on data collection and the transfer of knowledge and good practices to countries (WHO, 2016e). The WHO also launched the Global Surveillance and Monitoring System for SSFFC

medical products in West Africa in July 2013: over 300 regulatory personnel from 113 Member States have been trained in its use, and 1 040 SSFFC medical products reported. Where a medical product is reported as SSFFC and is high risk or associated with an adverse drug reaction, consideration will be given to issuing a WHO medical product rapid alert (WHO, 2016f). The WHO is also currently consulting on recommendations for the content of a survey protocol for surveys of the quality of medicines (WHO, 2016b). Ultimately, long-term solutions will likely require government-led efforts to modify pricing, taxation and regulation in a way that promotes, and does not undermine, quality drug supply (Harris, Stevens & Morris, 2009).

Efforts by suppliers to enable identity preservation through holograms and tamper seals have largely been circumvented, and current approaches developed by the private sector include the use of digital technology. For example, one system developed in Ghana, India and the US includes the use of mobile phones to verify the identity of products using numerical identifiers against a central database (Regan, Blyth & Effler, 2013; Jordan & Kutter 2012; Isa et al., 2014), and this method is being implemented in many parts of Africa and Asia (Harris, Stevens & Morris, 2009). Other systems include the use of pack specific identifiers/serialization that can be authenticated at the point of dispensing through barcode scanning (WHO, 2016d). More advanced technologies in development involve track and trace technology using two dimensional bar codes, radio-frequency identification, synthetic DNA coding, and others to track products through the supply chain, from manufacturer to point of dispensing (WHO, 2016d). Some governments have mandated the use of these technologies. In addition to enabling identity preservation, ensuring the preservation of quality is equally important, and this might be made easier in future through the use by retailers of spectrometers, which allow instant quality testing (Harris, Stevens & Morris, 2009). In the short term, the private sector has an important role to play in its capacity to experiment with various innovative technological solutions (Harris, Stevens & Morris, 2009).

3. INTERVENTION AND IMPLEMENTATION

Sproxil was founded in 2009 to empower consumers to help combat drug counterfeiting using simple mobile technology. Although Sproxil's solution has now been applied across a range of industries, including beauty and personal care, fast-moving consumer goods (FMCG), electrical goods, automotive, oil and gas, and agribusiness, this case study will focus on its work in the pharmaceutical industry. Sproxil's solution combines a unique labelling system with digital technology to identify counterfeit medication at the point of purchase.

3.1. MOBILE PRODUCT AUTHENTICATION™ (MPA)

Sproxil supplies pharmaceutical manufacturers with security labels each containing a unique personal identification number (PIN) code; a label is attached to each medication pack at production. At purchase, the customer scratches the security label to reveal the unique PIN code. They can then verify the product's authenticity, using the PIN code, by: 1) sending a free SMS; 2) phoning Sproxil's call centre; 3) using the Sproxil mobile application; or 4) using the Sproxil webpage. Each delivers a reply either confirming the product's validity or flagging it as counterfeit and urging the consumer to call a hotline and provide further details anonymously.



Image 1: Sproxil label. When scratched, a unique 12-digit PIN code appears that can be used once to verify product.

A key innovative aspect of Sproxil's solution is its simple user interface, designed for low-resource settings. Many alternative solutions use more complex technology (including radio frequency identification (RFID) tags, and quick response (QR) codes read by smart phones), which can be a significant barrier to adoption in low resource

settings. MPA, Sproxil's patent-pending solution, relies on simple mobile features and a scratch-off label, making it widely accessible. Additionally, the solution requires limited customer training and can be customized for illiterate customers (image-based instructions). Since the service is free, consumers can even borrow a phone (e.g. from the pharmacist) if they do not have one. The simplicity and speed of the solution means that consumers can verify a medication's authenticity before purchasing it, saving them from wasting their money.

3.2. SHARED VALUE SERVICE MODEL

Sproxil has created a unique shared value service model that aligns the interests of key stakeholders in a complex supply chain, including manufacturers, regulators, and end consumers. Sproxil's solution incentivizes each one of these stakeholders by enabling them to combat the huge losses (social and financial) attributable to counterfeiting.

- Manufacturer:** In each of the countries where it operates, Sproxil has designated sales teams responsible for recruiting new clients and managing business relations. Current clients include: Johnson & Johnson, GlaxoSmithKline (GSK), BIOFEM (a Nigerian distributor of Merck KGaA), and many generics manufacturers. These generics manufacturers are mostly Indian companies that export to Nigeria. Sproxil supplies unique labels to each of these drug manufacturers.
- Customers:** Sproxil runs awareness campaigns and other promotional activities at local pharmacies and distributors to educate customers about the harms of SSFFC medicines and raise awareness for Sproxil's service; radio campaigns have proven to be a very effective way of achieving this in Nigeria.
- Sproxil Call Centre:** Sproxil maintains a call centre that: 1) follows up with customers of counterfeit products to collect actionable

information for regulatory response; 2) responds to customers' queries; and 3) conducts surveys to identify problems and respond to customers' needs. Information collected on counterfeit activities is shared with the client and the responsible regulatory authorities as requested.

- **Data Analytics:** Sproxil collects multifaceted data at each stage of operation. Records link each PIN code to the specific product and manufacturer, and qualitative data through call centre interactions stratifies this into feedback categories and actionable responses. Aggregated, these data provide valuable insights to regulatory authorities as well as to business clients.

3.3. COUNTERFEIT INFORMATION

Through this direct customer interaction, Sproxil collects a large amount of data with which they can map counterfeiting activities. At the back-end, the continuously evolving data analytics provide regulators and business clients with actionable

information, adding value across a complex supply chain. This information can then be shared with the government authorities responsible for tracking and regulating counterfeiters. This is an area of its service offering that Sproxil intends to strengthen over the next five years as it recognises the benefit this could bring to its clients, as well as the regulators operating in the industry.

In addition to information about counterfeit products, Sproxil plans to expand its data analytics offering to include information on consumers' buying habits, preferences and satisfaction reporting that is collected during the consumer interaction phase of the solution. *"So that's the direction which our business is going. We'll begin to sell the insights that we have on various markets. As we get time of day purchase of the products, we know when products are being sold in various markets, and how to optimize marketing by looking at the increase of verifications after an ad is run on rabies, for instance. So we have a number of commercial value propositions that come out of our work naturally."* (Ashifi Gogo, Founder, Sproxil)

4. ORGANIZATION AND PEOPLE

Founded in 2009, Sproxil's mission is to build trust across supply chains with mobile technology solutions that emphasize direct engagement from the factory through to the consumer. Its vision is to enable consumers in populous emerging markets to make the best purchase decision through providing verification on a product's authenticity.

Ashifi Gogo, Sproxil's founder, was a graduate student at Dartmouth College when he began brainstorming the idea behind Sproxil. At the time, Gogo was interested in optimizing effective spending on groceries. *"Without too many local options to get discount groceries, the idea was to have a system in the shop that will help you pick the freshest of the produce... by tagging, say, your tomatoes with a 2D bar code... at the point where it's grown, and tracking it all the way to the shop so that you can scan and identify if the product is the freshest you can get. So, you get the two-day-*

old organic, not the two-week-old organic." (Ashifi Gogo, Founder, Sproxil) Although Gogo developed a corresponding business plan and won prize money from a few competitions, he struggled to gain market traction. Ultimately, the problem in grocery shopping was too small. Shortly after, Gogo transitioned his ideas to counterfeit drugs in places like Nigeria. *"We looked at overseas markets where counterfeiting is something that's top of the mind of people visiting a pharmacy, particularly in Nigeria because over 80 infants had died from teething syrup that was tainted with anti-freeze around 2008."* (Ashifi Gogo, Founder, Sproxil)

While the solution was initially designed for the pharmaceutical industry to combat SSFFC medicines, the wide-ranging applicability of the solution was apparent. Brand protection is needed for any industry prone to counterfeits. Sproxil now operates across many different industries,

including beauty and personal care, FMCG, electrical goods, automotive, oil and gas, and agribusiness. Gaining worldwide recognition, Sproxil has become a company that protects brands globally, with operations in Nigeria, Ghana, Kenya, Tanzania, India, Pakistan and the US. Despite rapid growth, the company has cultivated an environment of cultural diversity, friendship and a shared mission. The team's internal excitement translates into continuous innovation, thereby constantly improving the service they offer.

You know, while we're a tech company, every single person here in the US office is all about the social enterprise aspect. We're not programming these codes that protect all the products that we protect because we like programming. We do like programming, but we are doing it because we are making an impact on people's lives around the world. We have people in our local offices in Ghana, India, Nigeria, Kenya, Pakistan, who ... it's

their people, it's their medicine that they are buying every day. It's for their daughters and sons, their mothers and fathers, and so we're hearing from them first-hand: "Oh yeah, you know, I went and bought this medicine and it was Sproxil-protected so I know that it is genuine and my next door neighbour went and bought one off the street and they are not getting better." So, we're hearing first-hand how we are making a difference. (Jennifer Campos, Service Innovation Manager, Sproxil)

Young professionals are attracted to the company by the opportunity to work in a dynamic environment fundamentally driven by a greater social purpose. Ashwin Dhumal, for example, was working for a large multinational organization when he met Gogo; inspired by the opportunity to pursue his ambitions but also work on *"something that is saving so many lives"*. Dhumal is now a Sales Director at Sproxil India.

5. BUSINESS MODEL

Our business plan allows us to work on several different industries as we plan to be the patients' or the consumers' protector in large emergent markets. So before they buy a product, if they do not want to get ripped off in the transaction, they will use Sproxil to check out the product, make sure that it is effective. And also in the future, to see if the ingredients are as they expect, and to see that they've been sourced responsibly and so on, so that the consumer can really get all that which is required to make a smart decision about, about their purchase. (Ashifi Gogo, Founder, Sproxil)

Outside pharmaceuticals, Sproxil works with companies producing agrochemicals, clothing, food and beverages, and many other FMCG. These companies operate in poorly regulated markets where counterfeiters can steal market share on the back of their brand name. By operating across these different product categories, Sproxil has been able to grow fast and develop a multi-pronged sustainability strategy. In markets where the pharmaceutical industry is harder to access, especially for a young business, Sproxil has built

up its reputation and a reliable customer base by engaging with cross-industry consumers.

When expanding to new markets Sproxil has could leverage grant funding to support operations if a client is unable to fund the whole expansion; for example, Sproxil was recently awarded a grant from the Human Development Innovation Fund (HDIF) in partnership with the United Kingdom's Department for International Development (DFID), to *"expand Sproxil's business into Tanzania and to educate consumers about the health risks associated with counterfeit products"*. Gogo expressed his strong belief that *"grant funding and ... early stage funding that may come with less strict requirements and strings attached ... is more enabling for young companies to spend freely, to get innovations off the ground"*. Gogo emphasizes that *"without the initial grant funding, it would have been more challenging for us to get the initial set up and clients that were of interest."*

Sproxil personalizes customer engagement based on the business client and the industry. The use of mobile credit rewards, for example, has been

successful in certain industries. Anand C. Mehta, Head of India Operations, describes incentives for Indian farmers to use the agrochemical product of a client: every time a verification code was submitted, a mobile credit reward was given. This allowed Sproxil to collect large-scale customer data, including information of time and

geographical area of purchase; it also allowed the agrochemical provider to set up an advisory service for farmers who have bought its products, providing them with information on crop seasonality, weather conditions, etc. This type of customer engagement has helped build brand loyalty both among shopkeepers and consumers.

6. OUTPUTS AND OUTCOMES

6.1. IMPACT ON HEALTH CARE DELIVERY

To assess its impact, Sproxil tracks the total number of drug verifications and the unique mobile numbers these originate from. The company produces monthly and quarterly reports for internal evaluation of impact and organizational development. The total number of authentications is publicly available through Sproxil's website. As of January 2016, Sproxil had registered 21.9 million authentications, with 12 million unique users of pharmaceutical products. Sproxil also collects more detailed customer feedback through its customer call centres, which receive calls from customers, and perform randomized surveying.

Sproxil has published a case study based on its first pharmaceutical client, BIOFEM Pharmaceuticals Ltd, a distributor of Merck KGaA in Nigeria. Before BIOFEM implemented Sproxil's solution in Nigeria, sales of its diabetes drug Glucophage had fallen by 75% in one year, mainly due to counterfeiting. One hundred days after implementation of Sproxil's MPA solution, sales of the same drug had increased by 10% (Sproxil, 2010).

Many people in the Global South suffer multi-layered effects of poverty when it comes to consumer options, including medication and health care products. Goods and services are often sub-standard (counterfeit, expired, or damaged). The lack of adequate customer protection regulations means that people waste their limited income on products and services that do not serve their needs. Sproxil's solution has social benefits beyond the just the consumer protection it offers.

It improves the customers' ability to make effective decisions to maximise the use of their limited resources.

6.2. COMMUNITY AND BENEFICIARIES

Sproxil's solution has a diverse set of beneficiaries, including individual consumers, government authorities (regulators, tax and revenue authorities etc.) and businesses.

- **Individual consumers:** Sproxil provides consumers with an easy and accessible way of verifying the authenticity of the products they buy, protecting their health and safety as well as their rights to genuine products. *"We'll be tagged in a Twitter update that has a picture of a medicine... in Nigeria saying: 'We've just bought prenatal vitamins, and they were Sproxil protected... thank you'."* (Jennifer Campos, Service Innovation Manager, Sproxil)
- **Government authorities:** Sproxil provides different government agencies with actionable data in their fight against counterfeiters. This can improve tax revenues, which counterfeit markets reduce both by tax evasion and stealing profits from legitimate manufacturers. And Sproxil's inexpensive and accessible platform allows governments to bypass traditional forms of counterfeit regulation, such as that of sample collection by field agents, a process that is expensive, inefficient and often rife with corruption.
- **Businesses and manufacturers:** For legitimate businesses, counterfeit products result in lower profits due to loss of market share and pricing

pressure. Sproxil offers businesses a service tailored towards their size, business model, needs, customers, and marketing strategy. Once implemented, the intervention collects data that Sproxil feeds to the client, which can be used to inform market strategy. Moreover, using this data, businesses can collaborate with government authorities to identify and remove counterfeiters.

6.3. ORGANIZATIONAL MILESTONES

The first major milestone for Sproxil came in 2009 with its first client, BIOFEM Pharmaceuticals Ltd. Both parties benefited. Sproxil's solution was implemented on more than a million sachets of medication; BIOFEM's trend of decreasing sales was reversed, providing a substantial return on its investment (Sproxil, 2010).

This success snowballed. Growth in Nigeria was expanded to several other African countries

(including Ghana and Kenya) and operations were initiated in India, and, in 2015, in Pakistan. In India alone, Sproxil is servicing around 40 pharmaceutical companies, as well as several others in the agrochemical and food and beverage industries. Although Sproxil was the only player in the market upon launching in 2011, two competitors have since emerged, encouraging the company to differentiate its service and deliver exceptional quality within a very price-competitive market.

Sproxil's work has been globally recognized, including by the Clinton Global Initiative, The World Business and Development Awards, Fast Company (listing them as Most Innovative Company in Health Care in 2013), the White House Champion of Change awards and The Schwab Foundation (naming Ashifi Gogo Entrepreneur of the Year for Nigeria in 2014).

7. SUSTAINABILITY

Sproxil uses a diversified revenue model to achieve financial sustainability, attracting clients from a range of geographies and industries. Manufacturers who pay Sproxil to protect their brand against counterfeiting are Sproxil's primary source of income. Sproxil's analytics service, which provides clients with access to business analytics based on data collected on their product, offers a second income stream. The third and final source of revenue is advertising, which Sproxil offers to businesses interested in reaching a large consumer base. This occurs through messages sent by Sproxil on a spam-free, opt-in basis. Through this multifaceted business approach, Sproxil turned profitable in 2014.

To sustain this growth, Sproxil is committed to continue developing better ways to: 1) empower

consumers to make informed decisions about their purchases, especially when it comes to their health and safety; and 2) help manufacturers of legitimate products reach more consumers, forcing counterfeiters out of the market.

To build long-term relationships with business clients, Sproxil is continuously improving its market analytics offering, including insights into counterfeiting hotspots, prediction of stock-outs, effectiveness of marketing strategy, etc. Sproxil is currently partnering with a non-profit-making organization to better predict stock-outs and understand disease burdens in Nigeria. In the future, aggregates of Sproxil's data across industries could be valuable for insights into consumer habits in emerging markets, creating an additional revenue stream.

8. SCALABILITY

Sproxil considers scaling to new industries and new countries. Key components to Sproxil's scalability are: 1) high mobile phone penetration and reliable telecommunications networks; 2) companies requiring brand protection; 3) consumers aware of both the dangers of counterfeit products; and 4) governmental/regulatory support or alignment. Providing its service to manufacturers is beneficial but not essential, as Sproxil has proven that working with wholesalers and distributors is also possible. Additionally, with its increasing global presence, Sproxil can provide labels to companies with manufacturing in one country and sales in another (e.g. drugs manufactured in India but sold in Nigeria).

New markets require contextualisation. For example, in Nigeria, customers are incentivized through air time awards and in Kenya, through mobile money. The language Sproxil uses also gets adapted for the local market. *"Localisation in India, the counterfeit drug issue is called the 'spurious drug issue'. ... So, we have had to retool some our language and pitch around that."* (Ashifi Gogo, Founder, Sproxil) Moreover, other industries may need to be tackled before pharmaceuticals in new markets, explains Gogo: *"In Kenya, for instance, our clients are in big electrical cabling industry, the agrochemical industry and the oil and gas industry."* This contrasts with Nigeria, where primary entrance into pharmaceuticals worked because the level of awareness and demand for solutions was already high. *"Counterfeit pharmaceuticals were widely known in Nigeria because of a couple of tragedies tied with pharmaceuticals. At the time that Sproxil first went to Nigeria, the head of the regulatory body at the time believed that her sister had died due to counterfeit insulin. And so even right at the top of the FDA there is a very high awareness in both mind and hearts around counterfeiting and that is*

not something that is easily discovered or replicated across various markets." (Ashifi Gogo, Founder, Sproxil)

Regulatory support has also proven to be key. In Nigeria, the National Agency for Food and Drug Administration and Control (NAFDAC) has a clear mandate to control and regulate the manufacture, importation, exportation, distribution, advertisement, sale and use of food, drugs, cosmetics, chemicals/detergents, medical devices and packaged water, including all drinks. This has made Sproxil's access to the market significantly easier (Akunyili, 2004). But in India, manufacturers are more reluctant to use Sproxil-labelled drugs. Although a large proportion of Sproxil's manufacturing partners are in India, only the medication they export is Sproxil-labelled. *"India does have a counterfeiting problem, a very serious problem. Yet, it doesn't have a mandate that makes [implementing counterfeit solutions] compulsory."* (Anand Mehta, Head of Operations, Sproxil, India) Furthermore, India has pricing regulations on drugs imposed by the National Pharmaceutical Pricing Authority (NPPA); hence, the cost of implementing Sproxil's solution is entirely absorbed by the manufacturer, at the loss of unit profit. To date, Sproxil's activities in India have primarily therefore involved other product categories.

Finally, scalability to other sectors appears dependent on a client's product margin structure, i.e. their ability to absorb Sproxil's costs. *"Irrespective of the size, in certain segments where the margins are really high and there are certain products which are intrinsically high margin products... Pharma... is a segment that... generally comes with a very high margin."* (Ashwin Duhmal, Sales Director, Sproxil India) Therefore, identifying such products and market segments has been a successful growth strategy for Sproxil.

9. KEY LESSONS

Getting started

Before formally accessing the market, Sproxil conducted several pilots. As Sproxil's 'customer zero', BIOFEM Pharmaceuticals Ltd played a crucial role in this early stage to shape the product, particularly regarding customer engagement. For example, Sproxil considered using an automated response system via SMS when BIOFEM argued for a call centre. *"Our customer ... said forget about that. Get a call centre. Get people who can speak local languages on the other end of the line and it'll [be] much more effective than this heavy investment in an artificial intelligence system that is not going to be able to interact very well with consumers ... And he was spot on. So, the initial feedback that we got from our, our lead customer was instrumental in getting us going."* (Ashifi Gogo, Founder, Sproxil)

Maintaining efforts

The approach of adopting customer feedback for idea generation and product evolution has continued to be used by Sproxil as it has grown. Sproxil also places value on ideas that come from staff.

As we got more clients, we got more people to feed us ideas, as to things we could invest in and so on. There's also a fair number of opportunities that come internally. For instance, one of the recent services that we launched is called third party investigator, TPI, such that when people get a counterfeit SMS or a suspicious product warning on their cell phone as a response to the verification transaction. We can actually call it, we don't have to wait for them to call us, we can call them, and then they will tell us the location ... And so we can get a location, we can get the batch number, we can get a whole bunch of product attributes and then feed that on to the brand owner and the regulator for them to take action ... For us, this is something that we developed internally, we already have clients using this service and we're working to make it dead easy for a regulator to go catch the suspicious product manufacturers and suppliers. (Ashifi Gogo, Founder, Sproxil)

Consumer awareness is crucial for the long-term uptake of Sproxil's solution; the company has consistently invested in novel approaches to consumer engagement. Promotional activities educating consumers about the dangers of counterfeiting and use of Sproxil's labels have made a tremendous difference in initial uptake. Sproxil is also working to improve long-term engagement, as people who frequently buy the same medication from the same pharmacist are likely to assume its authenticity after a few verifications. It is in those cases that reward incentives play a key role. Moving forward, Sproxil hopes to partner with mHealth providers to provide customers with access to health programmes through an opt-in messaging service.

Overcoming challenges

Sproxil's engagement with Nigeria's regulatory authorities from the very start has been crucial to its success. Part of this was timing: Sproxil entered the market just as regulators were actively looking for such a solution. In other markets, government authorities have been more passive, neither obstructing Sproxil nor enabling its solution. *"We're still discovering the extent to which we'll need to engage governments to accelerate the adoption of our services, and it varies based on country and based on industry."* (Ashifi Gogo, Founder, Sproxil)

In new markets, companies are often reluctant to be the first mover and fear the customer perceptions from engaging with anti-counterfeiting measures. *"The reason for them not taking the initiative is this: it's all about the perception. Say you are a customer and I'm one of the big companies, I'm maybe Glaxo. I come and say that my product will have this measure by which you check whether it is genuine or fake. The way the customer looks at it is: Glaxo has to ensure of genuine or fake... I should stop buying Glaxo products. So no one takes the... initiative."* (Anand Mehta, Head of Operations, Sproxil, India) To overcome this, the Sproxil team spends time with potential clients addressing their concerns and showing the potential benefits from adopting the Sproxil solution. They also approach companies

that are positioned in the market with a more natural inclination to take a risk. The more companies that adopt Sproxil's brand protection,

the more other companies are likely to follow suit. Investing time with the first few companies in any new market is an important part of the process.

CASE INSIGHTS

1. Private, for-profit companies can play a valuable role in generating and implementing solutions to public health challenges, such as SSFFC medical products. To do this successfully, it is necessary to engage with the wide range of stakeholders involved, and clearly demonstrate the benefits it can bring to each. Creating a shared value service model enables a private company to do this.
2. Technology can empower consumers to make informed decisions about their spending patterns and product consumption. Simple, user-friendly interfaces and low-specification design can make such technology available and understandable to a broad market of consumers.

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