

OPENPediatrics

Lighthouse Case Study

OPENPediatrics' web-based platform for teaching, exchanging ideas, and sharing best practices in

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Prologue

The Global Solution Networks research team has done an extensive literature review and initial investigation leading to the development of a comprehensive taxonomy that classifies the new networks being organized to address global problems. These networks are utilizing 21st century tools of technology, social connectivity and communication to develop solutions to global, multi-national and multi-cultural problems.¹ Our taxonomy provides useful categories for comparison and discussion, but it's important to note that, while the categories are comprehensive, they are not mutually exclusive.

Lighthouse Case Studies that provide examples of their taxonomic type will be used in the discussions included in the Global Solution Networks foundation papers on each type. OPENPediatrics is a clear example of the Knowledge Network type and material from this stand-alone case study can also be found in the GSN paper on Knowledge Networks.





Case In Brief

OPENPediatrics is an international pediatric knowledge network that seeks to improve the practice of pediatric medicine, especially at the patient care level, where access to knowledge and best practices is often limited to a small number of institutions with limited reach. Founded in 2009 by Jeff Burns, the chief of critical care at Boston Children's Hospital, OPENPediatrics' web-based platform for teaching, exchanging ideas, and sharing best practices in pediatric care is now used in 80 countries on six continents. The network has not only broken down the borders between specialty hospitals and remote caregivers, and between disciplines of medicine, but also between political boundaries, affluence and poverty, and even between doctors, nurses and community health workers who all contribute to the platform. The community of practitioners hopes that OPENPediatrics can significantly reduce the death rate among children, especially in developing countries with little or no access to advanced pediatric care.

OPENPediatrics

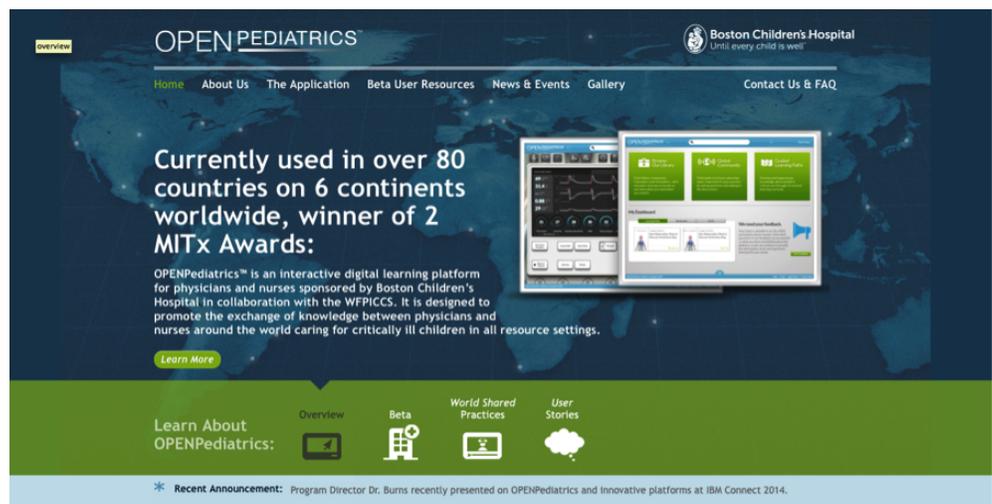
Envision this scenario: a baby is born in a delivery room of a hospital, not breathing and unresponsive. Doctors and nurses rush it to the neonatal intensive care unit, where a pediatric resident intubates the newborn and starts ventilating in an effort to get oxygen flowing through its system. No luck, the infant remains unresponsive and the time for resuscitation efforts is critically short. Then the pediatric resident treating the baby remembers a graphic animation from an app developed to share best practices around thousands of facets of pediatric care. The animation had demonstrated, in simple and clear terms, how the breathing device was supposed to work. The physician, recalling the animation, sees that one of the valves in the ventilator isn't operational. He moves the valve as the app instructed; the device begins to work properly and the baby begins to breathe. A life has been saved.

This is not an imagined case, nor speculation. It actually happened at a hospital in Israel, and the program the doctor recalled was created by OPENPediatrics, based 10,000 kilometers away, in the United States.²

What can be imagined, however, is how this case—and thousands of others—might have turned out were it not for the open knowledge-sharing network that the physician was able to tap into. If the doctor's knowledge had been limited by the education she had received, by the advice of her in-hospital colleagues or even by the practices sanctioned by her national government, that baby might not have survived.

Knowledge Networks Break Down Institutional Boundaries

OPENPediatrics came into existence because traditional walled institutions—whether they be academic, medical or political—often fail to channel and share the almost limitless expertise and knowledge available in all areas of the world. In many cases, those institutions actually hinder the sharing of that information.



OPENPediatrics.org, a Web-based platform for teaching, exchanging ideas and sharing best practices in pediatric care³

Thanks to the ready availability of the Web, and the inexpensive communications technology that makes use of it, knowledge networks like OPENPediatrics are able to transcend the institutions that were once the exclusive domain of ideas. They allow new ideas not only to be shared between people, civil institutions and businesses, but allow those ideas to be improved, shaped and enhanced by a multitude of people. As those ideas spread, they also branch out and evolve, far more quickly than any traditional institution could possibly extend its influence. The fact that they are not institutionally-based is their strength; rather than the traditional concept of ideas flowing from a small group, at the top of a hierarchy, in one direction, the knowledge network generates ideas at the ground level, from many people, in multiple directions.

While the realm of endeavor may differ, successful knowledge networks share several common attributes. Broadly speaking, knowledge networks:

- Transcend institutions, sectors, regions and/or disciplines
- Foster a culture of openness and inclusion in development of and access to knowledge creation



- Model self-organization wherein participants self-select for tasks in the network, but communicate and share in a coordinated way
- Use technology and social media to collaborate, share and access ideas and knowledge
- Enable a culture of reflection on best practices and continuous improvement of both the body of knowledge and the operation of the network itself.

A New Paradigm for Creating and Curating Pediatric Knowledge

As a discipline with knowledge at its core, and where standards vary considerably across nations and, especially, the world, healthcare is one of the most obvious and applicable areas for the knowledge network's viability.

And within health care, pediatrics is one of the most pressing issues in terms of distributing and sharing knowledge across borders. In Africa, one in five children will die before reaching five years of age. That compares to one in 115 in the United States.² Africa faces 24 per cent of the global burden of disease, but only has two per cent of the world's doctors. Sierra Leone has fewer than five doctors per 10,000 people.⁴

Those are some of the reasons why in 2009, Jeff Burns, the chief of critical care at Boston Children's Hospital and faculty member of Harvard Medical School, came up with the idea for OPENPediatrics—a collaborative, downloadable, web-based platform for teaching, exchanging ideas, and sharing best practices in pediatric care.

"Globally, only two per cent of health care dollars are spent on health care education,"⁵ says Burns, who remains the program director of OPENPediatrics. And, "Even as hard-earned medical knowledge has exploded in the scientific revolution of the last century, the means by which this information is taught has not fundamentally changed."

He explains the problem this way: "Efforts to expand the global access to medical information remain dependent on students going to the place of teachers, or less commonly teachers going to the students in remote parts of the world. Heroic efforts to provide medical missions to fill this gap are noble for the communities that can be reached, but they are inherently ineffective in addressing the scale and scope of the need that exists across the world."⁶



“The network has not only broken down the borders between specialty hospitals and remote caregivers, and between disciplines of medicine, but also between political boundaries, affluence and poverty, and even between doctors, nurses and community health workers.”

OPENPediatrics seeks to change that. Recognizing that technology has enabled communications efficiencies inconceivable even a decade ago, Burns aims to tear down the walls of medical schools and teaching hospitals, and, while acknowledging the efforts of NGOs like Doctors Without Borders, he says the key is to make knowledge around pediatric care accessible in the most remote corners of the planet, so doctors and nurses in these places can learn and adapt the best practices in modern care.⁷ Again, the key is technology: Burns points out that between 1990 and 2011, mobile phone users, for example, went from 11 million people to 5.6 billion, or 80 per cent of the world’s population.⁸ Similarly, in 1990, the US accounted for 75 per cent of all internet users. In 2011, it accounts only for 11 per cent of all users, with the biggest growth in the developing world.⁹

But online access to teaching materials is only part of the equation. There is also a need to curate the vast amount of health-related material available online—something that OPENPediatrics manages with the help of a network of doctors and nurses around the world. “A paradox of the present state of the internet is that while access to information is becoming easier,” Burns says, “it is more challenging to manage and sort through this vast amount of information to access content which promotes effective means of gaining knowledge, understanding, and critical thinking.”¹⁰

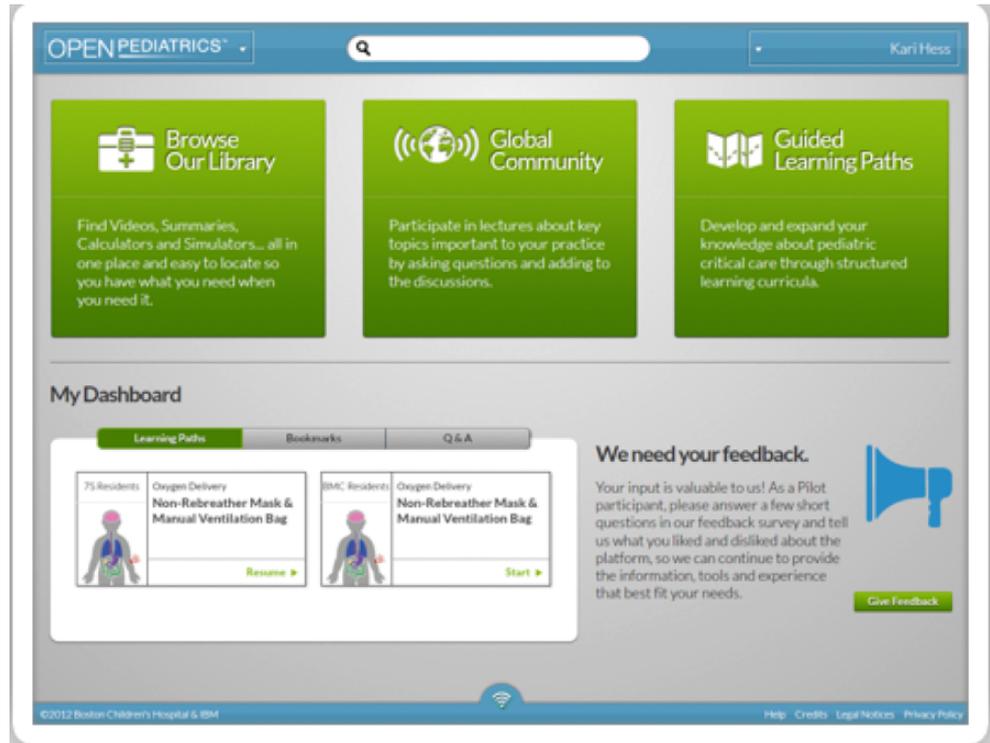
OPENPediatrics’ platform for knowledge exchange enables peer-to-peer interactivity among its users. A self-contained application, it offers guided learning in the form of videos and multimedia, information on demand and shared practice forums, where doctors and nurses can exchange ideas about patient care and medical issues, learning and teaching at the same time. “Virtual device simulators allow medical professionals to practice without touching a real patient,” says Burns. “Just as in the video games that are so addicting to the current generation of teenagers, technology-based learning is adapted to the pace of the user, simultaneously presenting information in multiple visual and auditory modes, which capitalizes on different learning styles.”¹¹

Evaluating Impact

Since releasing in beta in 2010 to a small number of physicians, OPENPediatrics has blossomed into a thriving knowledge network. It is now used in 80 countries on six continents,¹² and, because it is a self-contained, self-perpetuating platform, it is almost infinitely scalable. The access is free, and the program is available either online or as a standalone application. Doctors and nurses are encouraged, and expected, to contribute their knowledge and ideas in a continuous dialogue. Indeed, OPENPediatrics depends on its collaborating physicians and nurses for immediate and continual feedback, encouraging identification of knowledge gaps and help in filling them. Content is peer reviewed by designated experts who vet contributions to ensure their accuracy and effectiveness.¹³



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The OPENPediatrics app provides community, learning channels and content.¹⁴

As a paradigm-shifting initiative, OPENPediatrics is helping, with its technology and collaborative expertise, to reduce the death rate among children, especially in underdeveloped parts of the world with little or no access to advanced pediatric care.

As Burns points out, OPENPediatrics, in the last number of months alone, has presented its model to seven international conferences, including The Economist's Global Healthcare Summit in London. Burns himself won the MITx 2013 Visionary Award. And there are two more critical signs that the world is validating OPENPediatrics knowledge network model: since 2012, the staff has more than tripled in size, and money from independent donors has increased dramatically.

As one attending physician in Lusaka, Zambia, wrote on the OPENPediatrics website last month, "My opinion is that for [those of] us who have no adequate resource materials, this application is very useful and a long awaited development. Please keep it up."¹⁵



Governing the Network

OPENPediatrics was originally a collaboration between Boston Children's Hospital, Harvard Medical School, the Kennedy School of Government at Harvard and IBM, which helped develop the software. The organization is administered by a team of doctors at Boston Children's hospital, with an administrative staff that oversees the day-to-day operations, and it is governed by an external advisory board that includes experts in learning technologies, a representative from MIT's OpenCourseWare program, and Harvard Business School.¹⁶

However, in practice, OPENPediatrics is now effectively a decentralized network, with policy generated collaboratively by many of the world's largest pediatric hospitals. On the fourth Tuesday of every month, representatives from pediatric hospitals around the world gather online to address issues in the management of the network and delivery of information, problem solving, and to comment on the latest additions to the learning repository.¹⁷

The next transformation will come when OPENPediatrics moves out of its beta phase, expected soon, once the platform is deemed sufficiently stable in a technological sense. Currently, the beta application has a limited number of users; once out of beta, it will be fully open and accessible to any pediatric healthcare provider in the world.¹⁸

Implications for Network Leaders

We know it's hard to visit a news site or examine a twitter feed today and not see reports of some conflict regarding the use of knowledge—between nations, between governments and civil society, between corporations and between universities. While those traditional institutions certainly generate and curate a tremendous number of ideas, and continue to do so, it's clear that there are alternatives that are becoming more prevalent because of their inherent, and at times, radical openness, and their leveraging of technology to communicate, disseminate, debate and improve.

In some areas knowledge networks have become the *de facto* way we assemble and integrate information. It's difficult to imagine a world without Wikipedia, for example. With its strong community of contributors engaged in knowledge exchange, and an effective means of curating that knowledge, Wikipedia draws on the ideas of millions around the world. Many are experts and thought leaders in their fields; others are "amateurs" who have a



particular interest in a subject. The result is the same: a knowledge network that has become indispensable in our modern, connected, instant-on, information-hungry era.

Other projects, like GalaxyZoo, have harnessed the knowledge and ideas of people from many demographics and parts of the world to create a network that shares knowledge to sift through data and answer big scientific questions at a pace inconceivable a decade ago.

These massive online knowledge networks have traversed geographical boundaries, crossed and merged disciplines encircled multiple stakeholder groups and laid the groundwork for a new form of collective intelligence that will be able to tackle many of the issues facing the world.

Alongside these online knowledge networks is a space for smaller, targeted knowledge networks, like OPENPediatrics, that are breaking into areas traditionally reserved for—and often jealously guarded by—stakeholders and groups who have held a proprietary interest in maintaining the status quo. And in democratizing these areas in knowledge and ideas, and creating a barrier-free means to access and participate, they are showing that the possession and distribution of knowledge isn't a zero-sum game, even in the most competitive of environments. Indeed, as these three knowledge networks show, all who join or participate in the knowledge network lose nothing, but stand to gain immensely.

While every knowledge network will be different in size, scope and design, OPENPediatrics demonstrates attributes and facilities that anyone seeking to build a knowledge network should consider.

Leverage technology to enable real-time engagement among researchers and practitioners. Knowledge networks are made possible because the traditional transaction costs of collaboration are very low. Even a decade ago, the idea that an expert on sustainable development could collaborate, in real time, with a policy planner on a remote Pacific Island was the stuff of science fiction. Now it can be achieved for almost no cost at all. Moreover, that collaboration can effortlessly scale to a real-time network of policy makers, planners, professors, developers and NGOs, all communicating simultaneously and updating documents on the fly. Similarly, a few short years ago, it was inconceivable that a nurse in a refugee camp in Sudan could watch a video, on her cell phone, of the best practices in administering oxytocin to a mother who might otherwise die in childbirth. Web-based technology is cheap, effective, disruptive and leaves almost no carbon footprint. Take full advantage of it.

Build a wide, cross-disciplinary support and collaboration base. Specialist hospitals like urgent pediatric care facilities have long had a proprietary interest in exclusivity within a particular region or market. And many have had outreach programs in other cities and parts of the world where their expertise and knowledge is applied. But those programs are costly, limited in scope and location, and inefficient compared with the concept of leveraging technology to create an always-on network of ideas



and best practices that pediatric caregivers can access and contribute to without cost—even if they are in an area without regular Internet access. A knowledge network, after all, is only as good as the breadth of its collaborators. Indeed, the real strength of OPENPediatrics is its ability to offer a framework for what might usually be competing interests or groups to come together, share ideas and create synergies.

Ensure there are metrics to assess the efficiency and effectiveness of the knowledge network. OPENPediatrics provides a collaborative review process in the form of real-time meetings among the world’s leaders in pediatric care. This ensures that all facets of the field are being addressed, and that the material being collectively produced is scientifically rigorous and effective. Moreover, the fact that the content is shared openly means participants see value in their contributions, and that the model continues to attract new collaborators as the network grows.

Build accountability into the network. OPENPediatrics is transparent in its governance and operations; it files regular, public reports and is scrutinized by its funding partners. Moreover, there is a place to voice dissent in a productive way, and to accommodate suggestions in a process of continuous improvement. Regular, webcasted meetings of officials from contributing pediatric hospitals, for example, provide clear insight into governance and policymaking that all collaborators, and even the general public, can access in a well-curated way. Like the metrics described above, built-in accountability ensures collaborators that their contributions are being recognized, and also serves as a tool to allow new partners to join the network with confidence.

Don’t be afraid to start small, but make your network scalable. OPENPediatrics began as a collaboration between one hospital, a computing company and a university. But its knowledge-sharing model, with the above four elements baked in, made it almost infinitely and painlessly scalable. Now it is poised to be on the computer of every pediatric caregiver in the world, and able not just to deliver knowledge, but receive it, thanks to a well-designed web-based platform.

The broad principles that Knowledge Networks share (collaboration, accessibility and openness across political, stakeholder and disciplinary boundaries) are universal. While analysis shows those principles apply in almost any case—business, academic, or government—they are particularly relevant in a field where knowledge provided by the network has proven to be a lifeline in critical care—literally. Does the open sharing of pediatric knowledge diminish the brand of a particular hospital? Hardly. Medicine, as a field of enquiry and knowledge delivery, has ethics at its core. One might argue that collaborative sharing of best practices—knowledge that is available to all its practitioners, which allows those practitioners to contribute—is an ethical imperative.

by Adam Killick for Global Solution Networks



Endnotes

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About Global Solution Networks

Global Solution Networks is a landmark study of the potential of global web-based and mobile networks for cooperation, problem solving and governance. This research project is a deliverable of the GSN program, offered through the Martin Prosperity Institute at the Rotman School of Management, University of Toronto.

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Ten Types of Global Solution Networks