



A New Order

Using public-private partnerships to introduce technologies that can change the world

By Anand Iyer and Chester Lee

A NEW ORDER

Fueled by the emergence of breakthrough technologies, today's public-private partnerships (PPPs) have the potential to unlock greater value than they did in the past. Wireless technology, as one example, has helped spur the creation of a number of important PPPs worldwide. The In-Building Wireless Alliance, a Highway Infotronics project in India, and the Mobile Diabetes Management Expedition are three such partnerships that are leveraging disruptive technologies to improve everyday lives.

Firefighters arrive at a burning building and douse the flames right away, minimizing time spent thinking about site plans, HazMat closet locations, or egress. The command and control strategy for the rescue operation had already been developed, thanks to “remote situational awareness”—building information stored in a server, which was accessed through broadband communications en route. On the other side of the world, a fisherman uses next-generation wireless solutions to track sea conditions and determine the best place to cast his net. Before he returns to shore, he finds out which restaurants and markets will buy his fish and what price they will pay.

Now, think bigger. How would the world change if a disease such as diabetes could be managed with a few sensors, the Internet, and a cell phone, and therapy could be customized for each patient? The short answer is that it would change everything: people would live longer, healthier lives; millions, maybe even billions, of dollars would be saved from medical care costs and insurance claims; and possible solutions for other chronic diseases could be developed.

These scenarios aren't science-fiction projects. They exist now because of a transformation in public-private partnerships, or PPPs—alliances between the public and one or more private sectors to fund and operate a program that serves a public need.

PPPs were first developed because of a growing need by governments to build schools, hospitals, and prisons that they didn't have the resources to build

on their own. In Europe, where many PPPs were created, businesses contributed the financial backing for these projects. Problems, however, often surfaced when one player dominated, or participants did not equally share the financial risks and rewards.

More recently, PPPs have emerged as a powerful force in many parts of the world. These partnerships structure the risk-reward equation to equally benefit all parties. Government agencies create economic incentives, corporations develop and bring the technology offerings to market, and academia fuels technology research and trains next-generation innovators. The goal is to provide efficient and effective government services to the public at the lowest cost possible, while creating growth opportunities for the private sector.

However, what really differentiates PPPs today is their ability to commercialize breakthrough technologies with the potential to completely change everyday lives. Consider, for example, what the In-Building Wireless Alliance is doing.

The In-Building Wireless Alliance

Founded in 2006, the In-Building Wireless Alliance (IBWA) (www.ibwalliance.org) consists of commercial real estate, wireless carriers, infrastructure providers, building automation solution providers, and public safety organizations. The main objective of this non-profit organization is to accelerate the benefits for multiple building stakeholders derived from pervasive in-building communications, a technology lacking in most commercial offices. “Can you hear me now?”

Combining these resources with internal efforts, Tommy Russo, CTO of Akridge Properties, a real estate firm based in Washington, DC, has for the first time been able to quantify how this technology has improved the value of his building (Figure 1). Although the costs of such systems range from \$0.55 to \$2.30 per square foot depending on complexity and features desired, the corresponding value of the technology enhancements ranges from \$5.58 per square foot to as much as \$25 per square foot. That’s a 10x to 15x ROI, when features such as coverage, capacity enhancement, and energy-efficiency automation are considered. Yes, now I can hear you.

The IBWA also focuses on public safety and security issues. By getting public safety groups involved and addressing their concerns early on—for example, understanding where people are located in a building and how to access certain parts of the structure before firefighters arrive on the scene—in-building wireless can make a huge difference. According to the IBWA, cutting emergency response times in multi-tenant building fires reduces direct costs an average of \$109 million per city per year. Cost avoidance, through lowering the number of casualties as well as insurance claims, has even greater potential.

Figure 1: The In-Building Wireless Value Proposition

Illustrative example for a building measuring 670,000 square feet and with one person per 150 square feet

Participants	Value
Tenants	\$2.2M productivity gains from cellular and wireless local area network access
Carriers	\$1.8M from new subscribers, increased usage, decreased churn, fewer dropped calls, and decreased capital expenditures
Field force operations	\$368K from increased operational efficiencies
Public	Greater safety: priceless

Source: In-Building Wireless Alliance

Reducing energy costs is also on the IBWA agenda. Since energy accounts for about 38% of a building’s expenses, knowing how to light, heat, or cool a property most efficiently could yield significant savings. For example, sensors could link to wireless networks and automatically determine if heating, cooling, or lighting systems should be adjusted. Reducing energy consumption by 35% and lowering the overall building’s operating costs by 10% is quite achievable.

Highway Infotronics

The In-Building Wireless Alliance is just one example of how PPPs are being used to drive revolutionary change all around the world. In India, a massive, long-term national highway improvement project—similar in scale to the

U.S. highway project of the 1950s—is under way. Behind this initiative is a PPP with several participants: the Ministry of Heavy Industries and Public Enterprise, the National Highway Authority of India, automotive OEMs and tier-one suppliers, system integrators, the Society of Indian Automobile Manufacturers (SIAM), academic institutions, wireless operators, chipset manufacturers, and others.

The disruptive technology behind this PPP is *automotive infotonics*, defined by the Indian stakeholders as “a solution platform, driven by the convergence of mechanical, electronic, communication, and IT systems, for both in- and inter-vehicle applications in the automotive and transportation industries, which unlocks value through seamless information sharing and collaboration.”

Automotive infotonics will fuel the “Wireless in the Concrete” project, a plan to embed alternative information architectures into the highway infrastructure. The specific technologies to be employed include wireless sensors, next-generation cellular, and 802-xx networks for next-generation voice and data services and Intelligent Transportation Services (ITS) applications. In the background, various types of wireless communications devices, software platforms, data services, and IT infrastructure collect important information about road conditions, tolls, and other transportation statistics that can be bundled and accessed by various consumer electronics products.

“Imagine a truck driver going from Kashmir to Kanyakumari—opposite ends of India—who needs to pay tolls, ensure consignments are secure, and get real-time traffic updates,” says Dilip Chenoy, Director General of SIAM. “The problem is that each of these applications—if even available—is currently done via a different system as the driver progresses from state to state.”

With next-generation Wi-Fi capabilities planted every 500 meters, travelers, business people, public safety officials, and government agencies will be able to get updated highway information quickly, thus reducing travel times, pollution, and road congestion (Figure 2). Emergency responders and road crews will be able to clear up accident scenes faster and let other government agencies know where to distribute road advisories. As this information is collected over time, traffic and highway planners will be able to see patterns and pinpoint where capital improvements are needed.

The project will also drive commerce and promote development in rural areas. For example, roadside restaurants and prepared food vendors, who

depend on visits from buses and commuter vehicles, will be able to more accurately predict arrival times, which will make it easier to time food preparations. Fishermen who cast their nets within 500 meters of the coastal highways will be able to download global satellite images and sea conditions before setting sail; while returning to port, they will use wireless communication devices to negotiate prices with restaurants and markets.

Figure 2: The Indian Highway Infotonics Value Proposition

- 1%–2% additional GDP growth potential
- 10X reduction in cost of wireless services for rural and developing areas
- 20% reduction in journey times
- 10% increase in motorway capacity
- 18% reduction in NO and CO2 emissions
- 80% improvement in truck checkpoint processing cycle times
- 47% reduction in number of empty truck miles traveled

Source: Society of Indian Automobile Manufacturers

Other benefits will follow. According to PRTM estimates, the cost of wireless services for rural and developing areas is expected to drop by 10x. On a long-term basis, the project could well add 1% to 2% of additional GDP growth potential to the Indian economy.

“India has an opportunity to move toward a common infrastructure like cellular or WiFi, which support multiple infotonics applications,” Chenoy noted. “Doing so will require collaboration at the federal, state, and private levels, since the system affects telecommunications, road infrastructure, vehicles, and government tariffing groups. This is a chance for India to leapfrog her global competitors.”

Mobile Diabetes Management

For many health care providers, insurance companies, national health organizations, government agencies, and everyday citizens, diabetes has become an issue of extreme urgency. This chronic disease is on the rise in most countries, and the costs of managing it have spiraled out of control. Recent reports estimate that \$1 out of every \$8 spent on health care in the U.S. is spent on diabetes-related expenses. Put another way: The medical cost of a healthy person is \$2,560 per year, compared to \$13,243 for a person with diabetes, and there are 21 million diagnosed diabetics in the U.S. alone.

Globally, a staggering 246 million people have diabetes, and the number is expected to reach 380 million by 2025, with the greatest growth occurring in developing countries (www.welldoc-communications.com).

“The diabetes epidemic and its burden on the health care system has reached a level that cannot be resolved or managed effectively by private entities alone,” says Ryan Sysko, CEO of WellDoc Communications, a software development company focused on diabetes management founded in 2005. “Innovation is required across many areas: pharmacological, technical, clinical, and educational—to help patients and health care providers improve outcomes and reduce health care costs. But because of these extraordinary costs, no one company can expend the manifold effort required.”

Enter the Mobile Diabetes Management Expedition. This unique PPP combines resources from a variety of participants, including WellDoc (patients, physicians, insurance claims data, and software), various universities (research and analytical support), and a number of telecom operators (wireless devices and services). The initiative has attracted the attention of several business and U.S. congressional leaders. It’s easy to see why.

A major problem in treating diabetes has been the “one-size-fits-all” approach. People check glucose levels by sticking their fingers at certain times, and insulin or oral drugs are prescribed based on age, medical history, or conventional examinations. But glucose levels vary by individual, and each person’s body reacts differently to food, exercise, and medicine.

With the help of Mobile Diabetes Management, diabetes patients can use mobile phones, Bluetooth data feeds, and an expert analytic and alert system to have more control over their treatment.

Here’s how it works. Patients prick their finger and use a multi-purpose device—part cell phone, part software, part glucometer—to measure their blood sugar readings throughout the day. This data is sent wirelessly to a central medical management system, where it is used as an analytical tool—a virtual endocrinologist—to assess the patient’s health. Based on this information, alerts remind patients when to exercise and take medication. In the future, there will also be GPS applications to direct them to nearby food markets or restaurants. Additionally, the data can be sent to doctors’ offices and insurance companies, and used to track patterns, choose the best therapies, and monitor costs.

A three-month pilot study on 30 patients showed significant improvements for patients. Later this year, a series of larger studies aimed at different patient populations will be undertaken.

The benefits are beyond substantial (Figure 3). Physicians won’t have to guess which treatment works best for each patient, and patients will live healthier, longer lives. And according to WellDoc and PRTM analysis, potentially \$27 billion can be trimmed from U.S. health care costs directly related to diabetes. Indirect cost savings—from fewer heart attacks, strokes, and microvascular complications—will also be reduced, producing an even larger savings potential that could exceed \$90B annually. From a commercial standpoint, companies will be able to reach millions of underserved customers, and promote consumer loyalty through bundled hardware, software, and IT services.

Figure 3: The Mobility Diabetes Management Value Proposition

Participants	Value
Patients	Better health outcomes
Health care providers	Reduced costs, greater competitive differentiation
Hospitals	Improved quality and effectiveness of patient care
Third-party payors	Better health care outcomes for members and reduced claims expenses
Employers	More productive employees and reduced health care costs
Medical device companies	Improved sales of hardware and solutions
Wireless operators	Higher average revenue/use, lower customer churn
Pharma companies	Increased sales, more efficient clinical trials

Source: WellDoc Communications

Creating Successful Partnerships

With careful planning and goal-setting, PPPs can deliver huge results. Here are some guidelines to keep in mind:

Do's:

- **Do your homework.** Evaluate how this technology or similar technologies have been commercialized in the past. Weigh the risks and rewards. Look at failures for missteps to avoid.
- **Take a broad view.** Remember a simple rule: CIMA, or Common Infrastructure, Multiple Application. In the case of in-building wireless, energy efficiency, improved communications effectiveness, and public safety response are all achievable with a common infrastructure.
- **Ensure alignment.** Find out what the objectives of the various stakeholders are so you can create a win-win scenario. Share what you know.

Don'ts:

- **Don't expect results overnight.** Establish realistic goals and timelines that the coalition supports.
- **Don't forget the political agenda.** For many disruptive technology initiatives, the benefits support larger objectives, such as decreasing “digital divides,” improving rural education, and the like. In such instances, working with the political system can help you reach your goals.
- **Don't leave the partnership on autopilot.** There is bound to be friction among your partners, so an external force will need to keep the coalition moving. Monitor the initiative's progress at frequent intervals.

PPPs have the potential to commercialize disruptive innovations in other areas besides wireless. Sensor technologies, for example, could make an enormous impact on energy efficiency both in buildings and on the road. And one day pharmacogenomics will provide drug therapies tailored to individual patients' genetic makeup.

Public-private partnerships are here to stay. With the level of technology innovation anticipated over the next 10 to 15 years, everyone—individuals, companies, governments, and entire countries—stands to benefit.

FOR MORE INFORMATION, PLEASE CONTACT:

DR. ANAND K. IYER, PRTM Director, aiyer@prtm.com, + 1 202.756.1700
CHESTER LEE, PRTM Principal, clee@prtm.com, + 1 202.756.1700