New York State's GORR:
An IBM Solution Redefines Innovative e-Government

An IDC e-business Case Study

THE SUBJECT

The Governor's Office of Regulatory Reform (GORR) was created in 1995 with a mandate to promote common-sense regulatory policy and to slim down a bloated set of permitting processes, with the ultimate aim of improving New York State's economic climate.

THE GOAL

Develop a Web-based platform that streamlines the business permit application process in the state of New York, thus creating an improved climate for new business formation and new job creation.

THE SOLUTION

GORR's online permitting and application (OPAL) system is a Lotus Domino-based service delivery platform that allows business permit applicants to find permitting information and submit applications online (www.nys-permits.org). Fully transactional, OPAL leverages Lotus Domino's strong workflow and access control capabilities to facilitate interaction across New York's 36 state agencies. OPAL's most innovative feature is its ability to apportion a single application fee to multiple agencies—all of which is invisible to the user.

WHY IBM

"We wanted a vendor we could count on to deliver a flexible, reliable solution capable of growing to keep up with GORR's future requirements. The IBM Global Services team met or exceeded our expectations in all phases of the project."

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Executive Summary

Based on Lotus Domino, GORR's online permitting and application solution (www.nys-permits.org) enables business permit applicants (individuals seeking to start a business, or existing business owners) in the state of New York to research information pertinent to their permit application—and to apply for multiple permits online. The system, developed by IBM Global Services, runs on IBM server hardware and is protected by IBM Firewall 3.2. GORR selected IBM Global Services to build the PAS system because it sought an established vendor with a proven track record building complex, transaction-enabled solutions. Its satisfaction with IBM Global Services complete, GORR saw them as the ideal partner to assist them in the next—considerably more challenging—stage of GORR's e-business evolution. GORR has extended the IBM Global Services engagement through a statewide contract.

The most important benefit of the PAS and OPAL systems has been a vastly improved experience for entrepreneurs researching and/or submitting business permits to New York State agencies. The OPAL and PAS systems have also delivered numerous internal benefits to GORR, including improved efficiency and lower training costs. By implementing a flexible, scalable, and transactional infrastructure, GORR is well positioned to move further down the path of e-government.

The New York State GORR Solution at a Glance

! Core Functionality

Allows would-be business permit applicants to research permit information and to apply for multiple permits online.

! Software

Lotus Domino R5, Lotus Notes R5, IBM Firewall 3.2, IBM AIX 4.3

! Servers

IBM Netfinity, IBM RS/6000

! Services

IBM Global Services performed all design and development work.

! Key Benefits

! OPAL lowers the average training time for new Permit Assistance representatives by more than 90% (from six months to two weeks).

! OPAL cuts the time required for permit applicants to gain information and submit applications, and provides 24x7 availability.

! OPAL lowers the incidence of "bad" permit application data delivered to agencies, shortening the processing cycle.

! The PAS system contributed to a doubling of requests for permit assistance processed in 2000, leading to the creation of an estimated 4,500 private sector jobs.

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! **Background**

One of the hallmarks of New York Governor George E. Pataki's administration has been a relentless focus on making it easier to do business in the state of New York. In 1995, the administration made major strides toward this goal with the creation of the Governor's Office of Regulatory Reform (GORR), an authority charged with lowering the regulatory hurdles facing individuals or businesses who want to start or expand businesses in New York. In creating GORR, the administration sought to improve the state's economic climate by promoting a more tenable regulatory policy and improving the overall permitting process. In addition to its regulatory reform agenda, GORR also provides applicants with concrete, hands-on assistance in the application process, such as guidance on which agencies to contact and each agency's permitting requirements. Since its inception, GORR has gone a long way toward delivering on its mandate, having reduced the rate at which new rules were imposed by half and saving nearly $3 billion in the process.

With over 1,100 permits administered by 36 state agencies under its purview, GORR has made ease of information access one of its central themes. In its first years, GORR dispensed permitting information though a corps of highly trained call-center representatives that walked callers through a series of questions to help them define their information needs. Under that system, GORR representatives tapped into a legacy mainframe database containing the permitting information using a proprietary client. In December 1999, GORR made major strides toward improving information access with the launch of its permitting assistance system (PAS), which allows the public to access the GORR database via a Web browser. While GORR continues to employ telephone-based representatives, its move toward a Web-based information delivery platform signaled an increasing emphasis on using advanced technology to serve the state's economic development interests.

! **The Need: Taking e-Government to a Higher Level**

The PAS service, with its emphasis on empowering the public though technology, embodied a core principle of the Pataki administration—that Internet technology can and should provide a bridge between the New York State government and its citizens and businesses. Not surprisingly, the importance of the project was clearly recognized by Governor Pataki himself, who saw PAS as the ideal foundation for an even more ambitious technology-based initiative. In his 2000 State of the State address, Governor Pataki lauded GORR's efforts to date, and challenged the agency to set a new standard for cutting through red tape via progressive e-government initiatives. "We've taken bold steps to change the regulatory climate—now we will take an even bolder step," said the Governor. "If someone is going to invest in New York, we shouldn't punish them by forcing them to fill out the same information 10 times on 10 different forms for 10 different bureaucracies. That is why I have directed my Office of Regulatory Reform to assume the responsibility of filling out permits and getting them approved. Government will now bear the burden that it once

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imposed upon entrepreneurs. So if you're looking to start a new business in New York or expand an existing one, you'll simply log onto the Internet and fill out one form, instead of five, 10 or 20."

By calling for the consolidation of the permit application process, Governor Pataki sought to lower the hurdles facing entrepreneurs, while at the same time raising the bar on e-government as an economic development tool. Through his proposal, the Governor sought to remedy the complex, redundant and labyrinthine exercise that the New York state permitting process had become. According to David M. Poleto, GORR's Director, the breadth and depth of New York State's permitting requirements poses the greatest technical challenge to the streamlining effort. "New York's permitting landscape is unique both because of its horizontal scale—spanning 36 agencies—and because of the sheer depth of information required," says Poleto. "It's a landscape that a permit applicant could easily get lost in."

Action Plan and Decision Process

! First Steps

> "We wanted a vendor we could count on to deliver a flexible, reliable solution capable of growing to keep up with GORR's future requirements. The IBM Global Services team met or exceeded our expectations in all phases of the project."
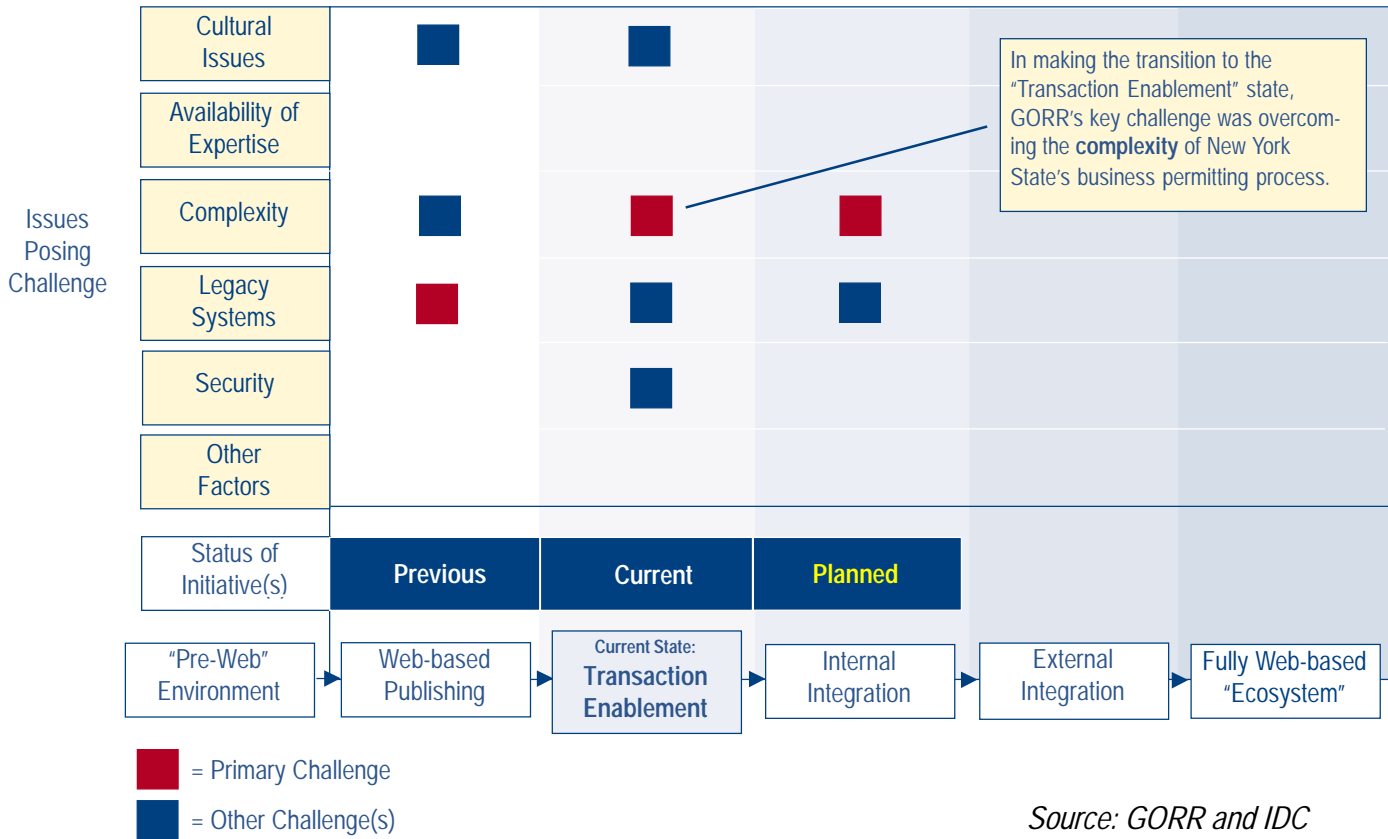>
> — David M. Poleto, Director, GORR

Having received a mandate from Governor Pataki to streamline the permit application process, the GORR team set out to develop a plan to make the Governor's vision a reality. Working with New York State's Office for Technology in early 2000, the team laid out the basic specifications for the system. In selecting a vendor for its one-stop permitting system, GORR turned to IBM Global Services, which had built the agency's PAS platform, using Lotus Domino and Notes, the year before. Recalling his agency's selection of IBM Global Services for the PAS project, Poleto points to IBM's solid track record and thorough approach as the main reason for its selection. "We wanted a vendor we could count on to deliver a flexible, reliable solution capable of growing to keep up with GORR's future requirements," says Poleto of the PAS project. "The IBM Global Services team met or exceeded our expectations in all phases of the project, from their exhaustive research at the outset on how the existing system worked, to the delivery of the final product. They created a platform that perfectly suited our needs."

! Challenges

But the functionality proposed by Governor Pataki presented GORR and IBM Global Services with an even more formidable technical challenge than the PAS system. Specifically, GORR needed to develop an easy-to-use, transaction-enabled solution that would sit atop a complex and overlapping set of permitting processes—which often involved multiple agencies. Perhaps most importantly, the underlying complexity and redundancy of the permitting process needed to be invisible to the user. The degree of challenge was further heightened by the urgent nature of the Governor's call to action, which made getting a workable solution into operation as soon as possible a key priority. To strike a balance, the team made an informed judgment that getting all 1,100 permits online would be a practical impossibility given the ambitious timetable outlined by Governor Pataki. Instead, the team opted to focus on a crucial

Challenges at Various States of GORR's e-business Evolution

Issues Posing Challenge

- Cultural Issues
- Availability of Expertise
- Complexity
- Legacy Systems
- Security
- Other Factors

In making the transition to the "Transaction Enablement" state, GORR's key challenge was overcoming the **complexity** of New York State's business permitting process.

Status of Initiative(s)	Previous	Current	Planned

"Pre-Web" Environment	Web-based Publishing	Current State: **Transaction Enablement**	Internal Integration	External Integration	Fully Web-based "Ecosystem"

■ = Primary Challenge
■ = Other Challenge(s)

Source: GORR and IDC

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subset of permits that are most widely required by applicants—with the aim of benefiting as broad a base of permit applicants as possible. The development of the online permitting and licensing system, or OPAL, had begun.

Solution Profile and Implementation Strategy
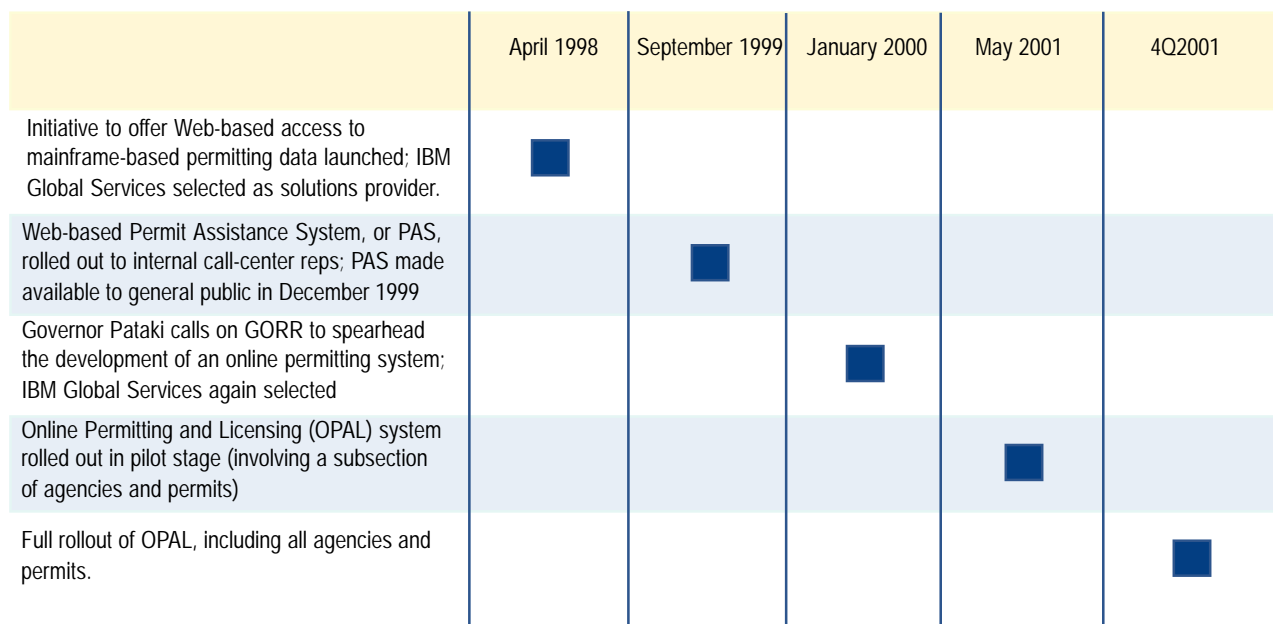
! Before OPAL: A Short History of the PAS System

To better understand the development of the OPAL system, a brief overview of the development of the PAS system is in order. The PAS system, developed by IBM Global Services using Lotus Domino, allows applicants to determine the permitting requirements that apply to their business, and to build their own "permit assistance kits" which then guide them through the permit application process. The PAS system's defining feature—its ability to lead users through interactive prompts without the need for assistance from telephone-based reps—is the outgrowth of an extensive IBM-led effort to map the process flow for permit inquiries. In addition to aiding Web-based individual users, the PAS system also serves as a productivity enhancing tool for GORR's call-center reps, whose use of the PAS system internally adds structure to what had been a generally unstructured interaction with inbound callers.

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While OPAL's stated function to is to provide users with the ability to apply for permits online, the underlying technical challenge was to create an effective workflow-based system to streamline the exchange of information among multiple government agencies. According to Mike Hartigan, GORR's IT Manager, working with the agencies was one of the first—and arguably most important—tasks of GORR's team. "We needed to get the agencies to buy into our plan," says Hartigan. "This was a team building effort in every sense of the word." In addition to team building, the agency meetings were crucial because they shed light on the data elements of each agency's set of applications—specifically, which data were shared across applications, and which were unique to a specific application. Information was also gathered on each agency's e-mail and Web capabilities, payment and fee structures, and other critical data to lay the groundwork for the next stage—the actual development process.

After several weeks, the development team completed its agency meetings, having received approval from the agencies on the systems requirements. The focus of the design and development stage, begun soon after, was to create an ideal data structure that would serve as the core of the system, explains Mark Hoesl, systems architect on the IBM Global Services team. "To accommodate the many different avenues of information a permit applicant could encounter—yet avoid redundancy—we needed to create an advanced, recursive data structure," says Hoesl. "That was the missing link and the key to our ultimate success."

Key Events in the Development of GORR's OPAL Solution

	April 1998	September 1999	January 2000	May 2001	4Q2001
Initiative to offer Web-based access to mainframe-based permitting data launched; IBM Global Services selected as solutions provider.	■				
Web-based Permit Assistance System, or PAS, rolled out to internal call-center reps; PAS made available to general public in December 1999		■			
Governor Pataki calls on GORR to spearhead the development of an online permitting system; IBM Global Services again selected			■		
Online Permitting and Licensing (OPAL) system rolled out in pilot stage (involving a subsection of agencies and permits)				■	
Full rollout of OPAL, including all agencies and permits.					■

Source: GORR and IDC

! OPAL in Action

The IBM Global Services team completed the first release of the OPAL system in May 2001. Like the PAS system, users of the OPAL system are guided through prompts and questions related to their business, upon which they are informed of the permits and the information they will need. Users are also asked if they are interested in applying for the said permits online. If the answer is 'yes,' the OPAL system will present a single "master" application that includes data common to all permits (name, address, etc.), perform an accuracy check on the data, and submit the master permit information to multiple agencies as an application and the system will start processing those permits. A typical small business will submit permits to six to eight agencies, such as the Department of Labor, Department of Tax and Finance, and the Department of Motor Vehicles. At this point in the transaction, applicants are asked to make a single payment, via credit card, to cover their permitting costs—and it is from this point forward that the OPAL system's capabilities are truly unique and groundbreaking.

After applicants submit their fee, the back-end of the OPAL system automatically deconstructs the single payment—actually an aggregation of multiple fees—and allocates it to the appropriate agencies. According to IBM's Hoesl, this ability to consolidate multiple transactions into a single one marks OPAL as truly unique among transactional e-government systems. "OPAL is truly a premier, groundbreaking e-government system—to our knowledge is the first of its kind in the world," says Hoesl. "Very quietly, this small agency in New York State has rolled out the first true Internet enterprise application that spans multiple agencies, invisible to the user, fully transactional, and fully realtime. It's a vision of the future."

Once an applicant submits an electronic permit application, the data is routed to the various agencies via an automatic e-mail notification, following a workflow model. On the agency side, the process begins when personnel receive the notification of a filed permit. Once notified, agency personnel log onto the GORR Web server (using a secure name and password), download the permit application, and begin processing it. Applicants, after submitting their applications and payment, can then track the approval status of their permits through an interface at the GORR site. To use the tracking feature, which is enabled by Lotus Domino's powerful workflow and security capabilities, online applicants input a unique identification number, and in return are able to view the status codes associated with the various permits in the pipeline. For their part, agencies will update each application's status code as it proceeds through the review process.
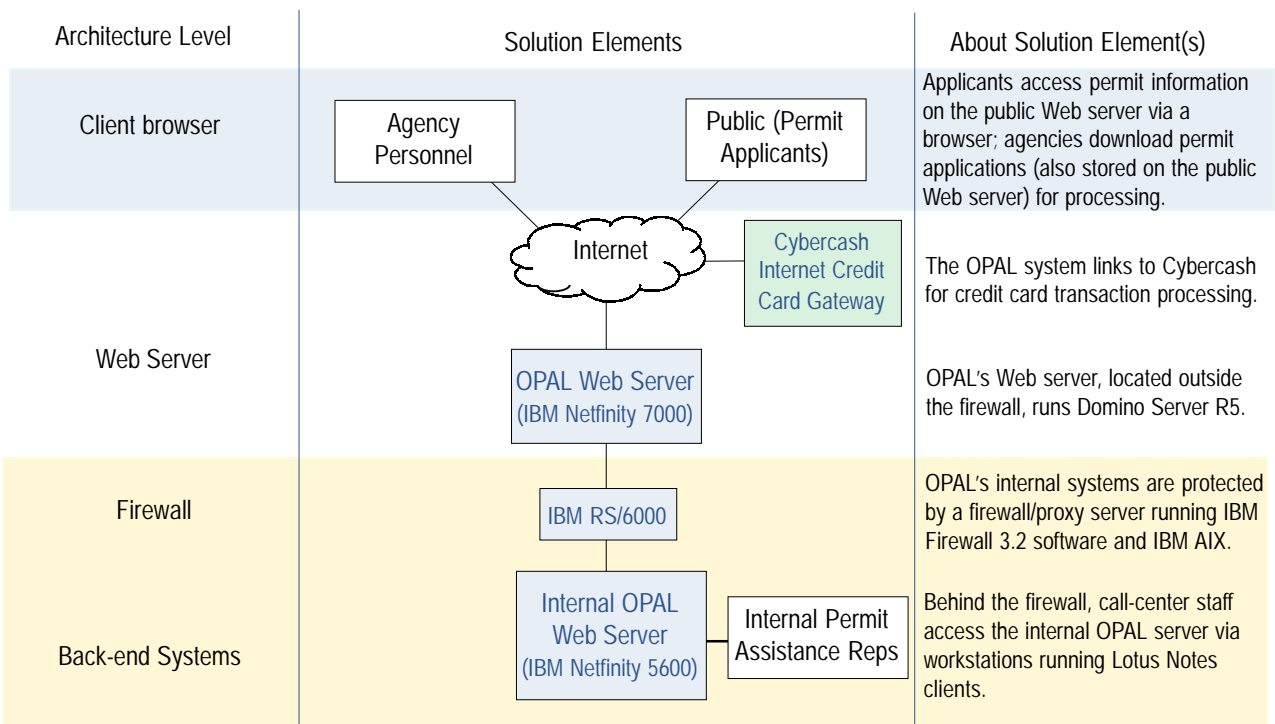
! Solution Architecture

The infrastructure for GORR's OPAL system is built almost entirely around IBM technology, with the key performance requirements being security (access control), ease of use, and scalability. On the hardware side, OPAL runs on three IBM servers hosted at GORR's Albany facility, including a Web server, a firewall server, and an internal Domino server. GORR's Web server, an IBM Netfinity 7000, sits outside the firewall (an IBM RS/6000 running IBM

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> Systems Architect,
> IBM Global Services

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Firewall 3.2). Residing behind the firewall is an IBM Netfinity 5600. Both Netfinity servers run Lotus Domino Server R5. GORR's public Web server is accessed by permit applicants (accessing the data stored in a Lotus Notes database on the server) as well as agency personnel (which download in-process permit applications for further processing). By comparison, GORR's internal OPAL server—which also holds permit information in a Notes data-base—is accessed by roughly 40 Permit Assistance representatives through a series of call-center workstations running Notes clients and connected via TCP/IP. As discussed above, these representatives tap the system's advanced querying capabilities to guide their telephone-based interactions with would-be permit applicants.

The heterogeneous nature of agencies' e-mail infrastructure was a major influence on the security and messaging standards specified by the IBM Global Services development team. For instance, the team circumvented the complex task of securely linking disparate e-mail platforms by enabling agencies to access in-progress permit applications using an SSL-encrypted browser and Lotus Domino's Access Control List core security feature. As Hoesl points out, the lack of data standards across agencies made XML (Extensible Markup Language) the ideal format for the data shared between GORR and the agen-cies. "XML was chosen because it's the Web de facto standard for information exchange," says Hoesl. "It's the way to exchange dissimilar information on the Web."

Basic Architecture of the OPAL Solution

Architecture Level	Solution Elements	About Solution Element(s)
Client browser	Agency Personnel / Public (Permit Applicants)	Applicants access permit information on the public Web server via a browser; agencies download permit applications (also stored on the public Web server) for processing.
Web Server	Internet — Cybercash Internet Credit Card Gateway / OPAL Web Server (IBM Netfinity 7000)	The OPAL system links to Cybercash for credit card transaction processing. OPAL's Web server, located outside the firewall, runs Domino Server R5.
Firewall	IBM RS/6000	OPAL's internal systems are protected by a firewall/proxy server running IBM Firewall 3.2 software and IBM AIX.
Back-end Systems	Internal OPAL Web Server (IBM Netfinity 5600) — Internal Permit Assistance Reps	Behind the firewall, call-center staff access the internal OPAL server via workstations running Lotus Notes clients.

Source: GORR and IDC

GORR's Poleto expects OPAL to be a potent catalyst to New York State's efforts to transform itself into a model of progressive e-government. "The OPAL initiative embodies a philosophy that has taken hold in our state government—that government is designed to provide people service," says Poleto. "We've seen huge bureaucracies built up over time that have often been impediments to providing that service. OPAL epitomizes a completely different way for government to provide service that eliminates all that bureaucracy from the customer's perspective—which is what really matters. But the even broader benefit we expect to see from OPAL will be an increase in new job creation by lowering barriers to new businesses. That's the root of GORR's mission, and OPAL has become our strongest tool."

The extent to which OPAL streamlines the permit application process is most visible when juxtaposed with the traditional process. Under the older application procedure, applicants faced the burden of identifying the roster of permits that were required, as well as the agencies that corresponded to the permits. Since applicants were required to fill out individual permits for—and pay separate fees to—each agency, redundancy and inefficiency were rampant. Once applications were submitted, tracking the approval status of each proved equally daunting. "OPAL promises to take the pain out of the permit application process," says Poleto, "which will allow businesses to focus more time on what's important—planning, starting and running their businesses."

Overview of GORR's Business Results Achieved

Business Process Area	Nature of Benefit	Description or Metric
Customer Service	Training Cost Savings	OPAL lowers the average training time for new Permit Assistance representatives by more than 90% (from six months to two weeks).
Customer Service	Improved quality of service	OPAL cuts the time required for permit applicants to gain information and submit applications, and provides 24x7 availability.
Internal Administration	Increased Efficiency	By screening for errors in the online application process, OPAL improves the quality of permit application data, shortening the processing cycle.
Customer Service	Faster Throughput	The PAS system led to a doubling of requests for permit assistance processed in 2000, leading to the creation of an estimated 4,500 jobs.

Source: GORR and IDC

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While improved service represents the highest priority for his agency, Hartigan also sees the OPAL and PAS programs providing a range of important operational benefits for GORR. "We're already seeing major increases in the effectiveness and productivity of our Permit Assistance reps through the call-coordinator portion of the solution," says Hartigan. "We expect to gain even more benefit through reduced training costs for new Permit Assistance reps. Before we implemented the system, new hires would have to sit next to somebody for a minimum of six months to learn how to find the information—a very inefficient use of our resources. Our call coordinator system, built using Lotus Domino and Notes, enables us to reduce our training burden by approximately 90 percent through the introduction of more intelligence into the system."

GORR's efforts to equip its Permit Assistance representatives with improved information retrieval tools has not surprisingly coincided with an increase in their effectiveness. One key example is the shorter cycle time required to process an information request, a benefit which—notes Hartigan—is already beginning to manifest in increased demand among entrepreneurs. "In the year following the introduction of the Permit Assistance System, the number of requests for permit assistance doubled, helping to speed the creation of an estimated 4,500 private sector jobs," says Hartigan. "We're also seeing increases in the number of permit assistance kits requested off the Web with every passing month. Right now we're doing around 500 permit assistance kits over the Web each month up from nothing just months ago. I think that provides a glimpse of how important a tool like this will become to those that need to interact with state government."

Over the longer term, GORR's investments in e-government infrastructure lays the groundwork for even more ambitious services in the future. As Hartigan explains, GORR's Web-based architecture, built around IBM hardware and software, gives the agency the flexibility it needs to accommodate growing demand for e-government services. "By moving to a Web-based architecture, we sought to break out of the old traditional mainframe-type environment—where change is slow, costly and painful—into an environment where we can utilize open architecture software," says Hartigan. "As long as we embrace open architecture software, we can easily adapt to accommodate whatever the future holds."

Case Epilogue

The GORR team reserves high praise for the IBM Global Services development team, expressing satisfaction with the solution and with the entire development process. "The source of my satisfaction with the IBM team is simple," explains Poleto. "They said what they were going to do—and they did what they said. In the process, they displayed an ability to not only come up with creative solutions, but to work closely with our internal staff to develop a system that really meets our needs."

Hartigan expresses similar views on the OPAL engagement, which he sees as a

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> — Dave Poleto

clear example of the benefits of working with an experienced provider of e-business solutions. "From the start, we've felt a sense of assurance that a company with the depth of experience, like IBM, wasn't going to put us in a box and stick us with something that was going to be obsolete in a few years," says Hartigan. "I'm very confident that we're now in a position to meet our needs today, and to move forward into the future."

Going forward, the GORR team plans to expand the number of agencies linked to the OPAL initiative, and to increase the breadth and depth of services offered. Future releases of OPAL will address such issues as electronic signatures, notarizations, and supplementary documentation requirements. According to Poleto, GORR plans to expand from initial permit issuance to permit renewals, ongoing reporting and beyond. "Pretty soon we'll have a whole other, far less painful way of accessing government through the Web," says Poleto. "So instead of saying 'I have a report that I have to submit to the Department of Transportation and I have another report that I have to submit to the Department of State,' it's just 'I have a report that I have to submit to New York State.' Period. This gives a glimpse of Governor Pataki's vision for e-government in New York State."

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