MANAGING ONLINE IN PERPETUAL PERFECT STORMS: INSIGHTS FROM INDYMAC BANK

Executive Summary

How can an enterprise manage strategically using an IT-intensive business model in a highly turbulent environment? How can it take best advantage of IT to enhance its dynamic capabilities in hyper-growth conditions? How can the CIO help lead the enterprise to managing online in conditions of rapid business change? We liken this situation to managing online in perpetual “perfect storms.”

This paper draws on the experiences and insights of IndyMac Bank to answer these questions. IndyMac is an IT-intensive mortgage bank that works in a rapidly changing environment. It conducts most of its business online, and has grown at a compounded rate of 41% since 1999. Even though it is a relatively small company, IndyMac changed the rules of the staid mortgage industry by its innovative use of IT and by cleverly weaving IT into the fabric of its business ecosystem. In the process, it learned how to manage online and gain strategic advantage while working in perpetual perfect storms.

PERFECT STORMS IN BUSINESS

A storm that was three storms rolled into one, and more powerful than any in recorded history, hit the Atlantic Ocean coast near Gloucester, Massachusetts, in October 1991. It was formed when Hurricane Grace collided with two strong storm fronts, forming what has become known (through a book and a popular movie) as the “Perfect Storm.” This extraordinary storm whipped the sea to insurmountable levels: boats encountered waves 100 feet high and winds of 120 mph. Vessels sank and men perished.

In a similar way, the business environment of the 21st century is seeing heightened turbulence in the form of rapid market changes, structural industry discontinuities, complex global dependencies, and disruptive information technologies. These storm fronts can collide to form perfect business storms.

Some CIOs face perpetual perfect storms because they must lead IT-enabled strategic initiatives that require a 24x7 online presence, while maintaining the even keel of orderly IT infrastructure development. Gulshan Garg, Executive VP and CTO of IndyMac Bank, expressed it like this:

There are storms coming at us from various angles: competitors quickly rolling out new successful products, regulatory changes that require capturing massively more data about customers for predatory lending, global IT outsourcing issues with human resource dislocations and role changes, key customers operating in new ways,...and much more. These are

---

1 Carol Brown was the accepting Senior Editor for this article. A longer version of this paper won First Prize in the Society for Information Management’s 2005 Paper Awards Competition.

2 A business ecosystem is the network of loosely coupled enterprises and organizations that influence the creation and delivery of an enterprise’s products and services. It includes competitors and other supply chains.

3 The authors acknowledge and appreciate the visionary leadership of IndyMac CEO Mike Perry and CTO and EVP Gulshan Garg, who together saw the strategic business potential of IT and “made it happen” at IndyMac Bank. This article benefited from managerial insights in interviews with Gulshan Garg and EVP John Olinski. We also thank Krishna Rallabhandy, Rahul Vishal, and Papa Rao Velichala for providing insights “from the IT frontlines” through interviews. Finally, we thank SIM for its continuing support of the annual SIM Paper Awards Competition, which brings together practitioners and academics in a way that advances the IS field and disseminates learning and knowledge.

4 For more information, see www.perfectstorm.org
not distractions, but are valid business issues that need to be dealt with and will force you to make mid-course changes and corrections. But, the key to surviving these storms is to stay focused on the business destination defined by the conviction of the strategic vision of the enterprise, and to steer IT to stay the course. When IT is a strategic enabler, that becomes very critical navigation.

This paper seeks to answer two questions:

- How does an enterprise intelligently change business models in an IT-intensive business environment that requires online operations to support hyper-growth goals amidst turbulence?
- How does the enterprise evolve its IT platform to enable, shape, and support changing business strategies and models in such stormy external and internal environments?

**INDYMAC BANK AND ITS STORMS**

IndyMac Bank®, based in Pasadena, California, rose from near obscurity to become the 9th largest mortgage bank in the U.S. through a fast and turbulent ride. In 1993, the core of IndyMac Bank’s current senior management team was formed. Mike Perry, CEO, assumed leadership of Countrywide Mortgage Holdings’ passive Real Estate Investment Trust (REIT) subsidiary, which soon became Independent National Mortgage Company, and later IndyMac.

IndyMac Bancorp, Inc. (NYSE: NDE) is the holding company for IndyMac Bank, the largest savings and loan in Los Angeles County and the 10th largest thrift nationwide (based on assets). IndyMac designs, “manufactures,” and distributes cost-efficient financing for the acquisition, development, and improvement of single-family homes. IndyMac also strategically invests in single-family mortgage-related assets and provides home equity loans to homeowners. In January 2005, the company employed over 5,300 people.

In 1999, a senior vice president at IndyMac Bank made a surprising discovery: the letters “INDYMAC” are an anagram of one, and only one, word: “DYNAMIC.” This quirk of fate actually foretold the company’s story of change amid hyper-growth and perpetual perfect storms.

IndyMac’s continuing storms come from four sources: external forces, hyper-growth, internal change, and IT-embedded business process change. (See Figure 1.)

**External Forces Storms** are storms created by forces outside of IndyMac’s control. It works in a volatile interest-rate-driven marketplace, competitors offer seductive new products or better pricing, it is regulated by the Office of Thrift Supervision, and its strategic partners make requests.

**Hyper-Growth Storms** refer to the rapid growth IndyMac has experienced since 1993, when its current management team came onboard. Rapid growth causes turbulence.

**Internal Turbulence Storms** are a byproduct of hyper-growth. IndyMac’s “execution culture” and its corporate belief that change represents opportunity led management to try several approaches to find out “what works.” It has achieved its extreme growth by setting stretch goals and resisting complacency. Strategies evolved. Reorganizations occurred. IndyMac also followed an IT-embedded strategy, which, over time, pulled IT resources in competing directions.

**IT-Embedded Business Process Change Storms** result from the joint efforts of the business and IT to leverage technology to reengineer and optimize its business processes, for example, its multi-year efforts in loan sales and loan processing and funding (described in the next section).

The IndyMac story illustrates how these storms build momentum, make their presence known, and then die out. Yet, new storms gather on the horizon, and some old storms reappear. And so, the cycle can repeat itself.

**INDYMAC’S EVOLVING STRATEGIC VISIONS AND IT-ENABLED IMPLEMENTATIONS**

From its inception, IndyMac’s culture has been about change. Its Pasadena headquarters prominently posts its corporate beliefs and commitments, which include

*Change:* Competition and technology will result in constant change. We must be flexible and adapt quickly to change to stay competitive.

Over time, IndyMac’s IT visions changed. They can be categorized as three eras – Brain, BRASS, and Brawn – as shown in Figure 2.

- **Brain:** In this era, IndyMac’s IT vision was to revolutionize the mortgage industry by creating a Web site with the most robust capabilities in the

---

industry. This strategy was largely implemented by e-MITS, its Web-based mortgage automated underwriting system, whose decision engine was internally called “the Brain.”

- **BRASS:** Once successful with online underwriting, IndyMac’s IT vision changed to making its technology more flexible, so that it could easily adapt to new market conditions and give business users control over the crucial mortgage underwriting rules. BRASS (Business Rules Automation System) refers to the business rules engine created to accomplish this feat.

- **Brawn:** IndyMac’s current vision is to become the 8th largest mortgage bank by 2008. To reach this goal, its IT systems must handle far more volume than today, and must handle the mortgage industry’s peaks-and-valleys cycle optimally. Its first phase is underway: reengineering the Loan Processing and Funding Office to distribute packets of work digitally to any group of workers in the world. This capability will allow the firm to easily ramp-up and ramp-down its global loan-processing workforce.

### The Brain Era: 1998 – 2001

When the current top executives arrived in 1993, they grew the little company and began dreaming of competing with the mortgage industry giants. Like most of the industry, IndyMac used loan acquisition systems from the major mortgage companies. Many of these systems were ported to the Web from their client/server beginnings. But IndyMac believed such a system could be improved even more. So it began
thinking about building its own. CTO Gulshan Garg commented:

“We wanted a best-in-class front-office offering. We deal with multiple customer segments, and we wanted to give them access to loan approval, pricing, and documentation requirements 24x7 without needing to talk to anyone at IndyMac.”

**e-MITS as Strategic Enabler.** e-MITS is an automated loan acquisition system that captures data on a Web site, sends this data to a proprietary underwriting engine, and then returns a price and underwriting guidelines to the Web site in about a minute or less. Previously, the industry norm was three weeks. Once the loan characteristics are received by the automated underwriting engine (i.e., the “Brain”), a number of events occur:

- A tri-merge credit report on the borrower(s) is pulled electronically.
- The data is analyzed to determine the loan programs that the borrower qualifies for (that is, if there is a conforming balance, send to Fannie Mae or Freddie Mac; if not, determine alternative programs).
- The loan is individually priced based on the loan amount and credit characteristics.
- Underwriting guidelines are generated, stating the conditions under which the loan will be approved.
- The information is returned to the Web site and displayed to the user.

Once the user is satisfied with the pricing and underwriting guidelines, he or she can then ratelock the loan via e-MITS.

IndyMac released e-MITS to a small pilot group of mortgage brokers in 1998, and rolled it out to its entire broker community in 1999. e-MITS rapidly became the way IndyMac did business. For a company like IndyMac, which, unlike most of its competitors, had almost no brick-and-mortar presence, this technology-enabled virtual model was a great equalizer – and much more.

Perhaps the key to e-MITS’ success was its “one door policy,” which allowed users to enter loan characteristics once and then wait for e-MITS to return a complete underwriting decision (including pricing) for multiple loan programs within an acceptable timeframe. Previously, users had to re-key information into each potential lender’s mortgage application until they found the “deal” they wanted. Users found IndyMac’s “one door policy” powerful.

Figure 3 shows how IndyMac’s loan processing progresses through three distinct “offices,” each of which has one or more primary IT applications. e-MITS is the primary application for the first “office,” the loan acquisition office.

e-MITS’ virtual model allowed IndyMac to scale operations as it grew. Unlike its competitors, whose business models required them to build more brick-and-mortar offices, IndyMac only needed to add small amounts of office space for its processing centers. The result: IndyMac lowered its cost-per-loan and deployed new loan products rapidly. The use of e-MITS also changed IndyMac’s customer base:

---

1 Ratelock refers to the customer’s ability to “lock-in” the quoted rate for a specific length of time, such as two weeks.
"From 1993 to 1995 we had around 50 large correspondent customers. These were high volume/low margin customers. Beginning in 1998 through 2003, these large customers were de-emphasized. e-MITS enabled us to target smaller customers, which expanded our total number of customers and provided a greater potential for profitability." – John Olinski, Executive Vice President, Secondary Marketing

As the business-to-business mortgage community increasingly accepted e-MITS, IndyMac expanded into more business segments. It built a consumer web site (B2C), followed by Web sites for Home Construction Lending (HCL) and Business to Realtor (B2R), each tailored to its unique set of customers. Yet, they all use the e-MITS decision engine.

e-MITS was released at the peak of the dot-com phenomenon in 1998. Web-based competitors, such as E-Loan, were featured on the cover of Business Week.\(^8\)

Although IndyMac did not gain such widespread publicity, it based e-MITS on a sound IT-embedded business plan. Many dot-coms went bankrupt or were acquired by other companies because they followed unsound business models. Most of IndyMac’s traditional competitors entered the electronic mortgage business with a "bricks-and-clicks" model. As the millennium approached, online mortgage systems began to gain momentum.

**The BRASS Era: 2001 – 2003**

Because IndyMac decided to be the first to provide e-MITS’ robust capabilities, speed was of the essence. Getting the capabilities into the marketplace was more important than strictly adhering to software engineering principles. So IndyMac took shortcuts, such as hard-coding rules into the Brain. Once e-MITS was successful, and was in the fabric of the way IndyMac did business, management worked toward its second vision of making e-MITS more flexible.
Its 2001 reengineering effort looked at the Brain with fresh eyes. The hard-coded underwriting rules were no longer acceptable because the number of rules exploded into the thousands as IndyMac launched new business channels (e.g., B2C, B2R, HCL), introduced new products, and changed rules, as the industry changed. The company needed a way to change these business rules easily and quickly.

**BRASS Implementation.** A mortgage is a real estate loan for which the approval and pricing is based on a series of rules. Borrowers with a high FICO (credit) score receive a lower rate. Loan amounts that exceed the limit imposed by the Government Sponsored Entities (GSEs) – Fannie Mae and Freddie Mac – are considered “jumbo” loans and are underwritten with a different set of guidelines. Interest rate changes can also require changes to the underwriting and pricing rules. IndyMac needed to react rapidly and effectively to these events, and so did its systems.

In 2001, IndyMac built a new underwriting and pricing rules engine, called “BRASS” (Business Rules Automation System), with an editor for changing rules. IT handed the BRASS Editor over to the business users who control the underwriting rules in Secondary Marketing. BRASS liberated them because they no longer needed to ask IT staff to modify, test, and release new rules. When they created a new product, they could change and publish the new rules themselves, in real-time. But this new process required process-level controls to ensure that new or modified rules received the proper authorization approval. BRASS gave IndyMac the capability to weather turbulence more easily and quickly.

IndyMac also instituted architectural changes during this era. The Brain was re-architected to optimize process flows and improve throughput times. The result was shorter wait times for end users to receive underwriting results from their loan submissions. The company also modularized other system components so that it could quickly make changes whenever the uncertain world of the mortgage industry dictated.

**The Brawn Era: 2003 – Present**

The Brawn Era is a work-in-progress, as IndyMac prepares its infrastructure to meet its goal of becoming the 8th largest mortgage lender in 2008. IT is concentrating most of its energies on applications supporting the second and third “offices” in Figure 3 – the Loan Processing and Funding Office and the Loan Sales Office. It is reengineering the processes and developing the technology to support the new processes.

**Reengineering the Loan Processing and Funding Office.** IndyMac is digitizing its paper documents, which are required for loan verification but have long been a constraint on efficient distribution of work. This step is the first half of the reengineering effort. The second half is developing applications to support the new process, which will no longer require workers in a single physical location to complete an entire loan underwriting process. Rather, it will divide those long processes into standard, granular tasks that can be distributed to the best-suited workers anywhere in the world. Management believes it must be able to “right-size” IndyMac’s workforce to respond effectively to the peaks in its workload when interest rates go down, and to the workload valleys when rates go up. This reengineering effort aims at this goal.

**Reengineering the Loan Sales Office.** In parallel, IndyMac is reengineering its Loan Sales Office (Figure 3). Due to the dearth of industry-standard applications for loan trading and shipping, IndyMac built several one-off applications for loan sales processes. Now it is in the midst of a multi-year program to automate as much of this office as possible.

**MANAGING APPLICATIONS AT INDYMAC BANK**

While organizational change and ever-increasing stretch goals were necessary to support IndyMac’s growth spurts, the changes did challenge employees, including IT’s application development group.

“We expect change. Change is written all over the walls, and it’s happening all the time.”

– Rahul Vishal, Vice President IT

The structured world of IT application development requires stability. But, as IndyMac proceeded through its growth phases, its development groups found themselves being asked to act like small entrepreneurial shops. IT management realized the company needed a more stable and mature application development environment. It responded with three initiatives: one to mature the application development process, a second to manage the project portfolio better, and a third to partner with the business.

**Increasing Application Development’s Maturity**

When building e-MITS in 1998, the IT group worked like a start-up. Its talented and dedicated developers worked long hours to complete the project. They were co-located in a single room to optimize communication. And, to foster speed, the group did not require the discipline of larger, more established IT shops. As noted, the mortgage underwriting rules were hard-coded in the Brain because that was faster.

Once e-MITS became successful, and supported more channels, demand for IT resources intensified. In fact,
IT found itself on the critical path for just about everything because systems were woven into the fabric of the enterprise, and management saw its IT-based platform as its route into the mortgage major league.

IndyMac’s application development group was besieged with requests from all quarters. The business managers of established and nascent channels wanted new functionality. Fannie Mae and Freddie Mac wanted integration with their automated underwriting engines. Training groups wanted IT-based training environments. Enterprise security wanted IT to lock down the Web sites from new hacker threats. And the mortgage industry itself presented other changes to IndyMac’s systems (see Figure 4).

To keep up with the demand for new e-MITS functionality, IT implemented a daily release cycle – a fairly common practice in the Internet heydays of 1999-2000. The net effect, however, was unrelenting pressure on the IT staff (programmers, managers, operations, and release management), frustrated business constituents, and “emergency fixes” in production the day after a release. Growth and success came at a price.

Realizing that the application development group could not run a perpetual sprint, IT management began moving the culture away from being entrepreneurial to embracing the discipline of software engineering. IT managers were held accountable for meeting deliverables at weekly project review meetings. Structured walkthroughs increased. Business unit managers were required to sign off on design documents. All constituencies were required to have “skin in the game.”

**Revitalizing Project Portfolio Management**

Project portfolio management was also an issue at IndyMac because almost every business unit project contained an IT component. As noted in Figure 4, the development teams were trying to satisfy demands from all sides. But they often could not.

A revitalized Project Management Office (PMO) played a major role in making projects successful. The PMO reviewed the many projects in the pipeline and challenged each project’s sponsors to make the ROI case for their project. The result was a prioritized list of projects in “active” and “future” categories. The “active” list was monitored weekly, and the formerly besieged application development teams worked on a structured queue of projects, which allowed them to focus on quality.

**Partnering with the Business**

“From an idea conception point-of-view, busi-
ness people are not always aware of what technology can do. For example, rather than take a tiered approach, we can take a parallel approach. IT is shaping new strategies. Rather than just delivering what is being asked for [by the business users], we can act as a true partner. This helps us anticipate storms and take appropriate measures.” — G. Garg, CTO & Executive Vice President

IndyMac, like many companies, struggled with getting IT and the business-unit subject matter experts (SMEs) to partner on projects. With information technology so tightly embedded in the business as it is at IndyMac, this collaboration is crucial. When potential automation benefits have been high, some business units have offered their top SME to work full-time with IT. In addition, to be effective, the IT developers had to learn how the business functioned.

IndyMac long championed mortgage business literacy for its IT development staff. Consistent with its philosophy of designing for change, the IT workforce has been built on cross-training and flexibility. In 2000, when most of the technical staff was unfamiliar with the mortgage business, the CTO instituted an informal training program called “Teach Your Team.” Teams of two technical staff researched and then presented such seemingly esoteric subjects as “Adjustable Rate Mortgages and Negative Amortization” and “Treasury Yield Curve and Mortgage Backed Securities” to the entire IT team. This emphasis on cross-training continues today, and facilitates the rapid reassignment of IT resources from less-urgent to more-urgent areas.

As IndyMac continues to refine its IT-as-Fabric business model, its application developers are evolving from “techies” into business/technology consultants. Their job descriptions are changing, too. IndyMac’s offshoring pilot program accelerated this shift by moving much of the coding offshore. The business/technology consultants’ primary job is now to learn a business process in minute detail, document that process, then partner with their business unit counterparts to create process and technology solutions. These IT consultants then write the detailed specifications for the offshore development teams.

This evolved process is the next maturation in a more structured application development philosophy.

INDYMAC’S IT-INTENSIVE BUSINESS MODEL AND ITS IMPACTS

In a turbulent dynamic environment, it is often difficult to clearly separate operations and strategy because operations can beget strategies just as often as strategies beget operations. This section describes IndyMac’s IT-intensive business model and its impacts on operations, strategy, and the mortgage industry ecosystem.

To maintain its superior performance in the turbulent business environment, IndyMac formulated a two-pronged business posture: a hybrid “hedging” strategy and an IT-enabled “flexing” strategy. To hedge, IndyMac Bank chose to be a hybrid: a mortgage bank and a thrift. This strategic business posture allowed IndyMac to deal with its varying interest rate environment: in periods of declining interest rates, it allocated more capital and resources to mortgage banking, while in periods of rising interest rates, it spent more capital on investing.

To flex, IndyMac launched the IT-intensive business initiatives described in the previous section to outexecute its competitors in dynamic situations. IndyMac’s IT-enabled value proposition to customers is fast response and convenience. It delivers offerings through multiple, complex, IT-enabled channels, and it achieves distinctive capability through superior IT platforms that meet ever-changing business needs. It executes these strategies by aiming to anticipate and detect future trends faster than its competitors, and by responding more quickly to unanticipated movements in its markets.

IndyMac’s high business performance can be attributed to its IT-intensive business strategies, visions, business models, and initiatives. In fact, these IT-centered initiatives resulted in major impacts not only on IndyMac’s operations and strategies but also on the entire mortgage industry ecosystem.

An IT-Intensive Business Model

While there is much talk about the value of business models, there is surprisingly little systematic conception of and agreement about what a business model is. We found that an IT-Intensive business model can be described and operationalized as four interacting components (also shown in Figure 5):

10 IndyMac’s bank originates and purchases loans, and then sells them in secondary markets.
11 IndyMac’s thrift uses financing from deposits to support mortgage-based assets.
1. **A Value Proposition for Targeted Customer Segments**: The value proposition for a particular segment of customers is usually accompanied by the reasons that segment would value the enterprise’s products and services, and would be willing to pay a premium price for them.

2. **An Organizing Model for Processes and Relationships**: The organizing model describes how an enterprise will organize its business processes, value chain, and partner relationships to deliver its products and services.

3. **Enabling IT Platforms**: These IT platforms enable, shape, and support the business processes and relationships needed both to deliver the products and services and to improve the value proposition. Enabling platforms become an increasingly important component of the business model in IT-intensive environments.

4. **Partner Revenue/Cost Calculations**: In a good business model, the combination of the value proposition, the means of delivering the offerings, and the investments in IT platforms results in revenues exceeding costs. Furthermore, when many partnering organizations are involved, the revenue agreement in the business model must be attractive to all the partners. Finally, the risk of forecasting errors (for both revenues and costs) should be manageable in the model, and the revenue/cost margin robust.

### Operational Impacts Through the Model

The IT-enabled business processes and information exchanges in an IT-intensive business model provide new ways to improve value propositions to customers, and thereby, attract new customers. The IT-intensive model also provides new ways to organize electronic channels and to work with partners. It can also reduce operating costs, improve response times, and enhance decision-making and business transaction processing. However, this business model comes with implementation perils, business process change, IT application development demands, and reorganization stress. IndyMac experienced all these impacts.

**IndyMac Improved its Value Proposition to Customers**. The firm serves several classes of customers for its home mortgages: mortgage brokers, correspondent lenders, real estate brokers, homebuilders, and individual consumers. Obtaining a mortgage can be complicated, frustrating, and time-consuming. It is a commodity product that is differentiated by price and process, not by branding. IndyMac’s e-MITS automated underwriting engine improved its value proposition. e-MITS gave potential borrowers immediate...
When an enterprise’s business model is IT-intensive, development organizational costs of IT platform documentation. e-MITS’ accurate risk-based pricing also allowed it to make loan funding decisions in less than one minute. This speed allowed mortgage brokers to appear to their customers as professional lenders (rather than bureaucratic intermediaries) and helped real estate brokers move consumers quickly to the point of sale. e-MITS let consumers lock in a loan rate for a specified period, and track the status of a loan on-line.

These enhanced value propositions to customers translated into an increased pull-through ratio for IndyMac. This ratio is the percentage of rate-locked loans that end up being funded. The pull-through ratio for traditional lenders is about 50%. IndyMac’s is over 70%, thereby reducing its costs by minimizing the resources it uses to underwrite loans it does not fund.

**IndyMac Opened Up its Organizing Model.** It changed its processes and opened up the new electronic channel with e-MITS. e-MITS impacted the B2B channel the most. Mortgage professionals quickly saw its merits and became repeat customers. The adoption rate in this wholesale market (that is, the number of loans that mortgage professionals submitted electronically through e-MITS) became 80% to 90% of the total (see Figure 6) almost immediately. This high adoption rate of IndyMac’s digital channel improved the firm’s efficiency and information gathering during the documentation phase of underwriting loans. In 2002, Fannie Mae estimated that lenders who used automated underwriting systems at the point-of-sale could save $1,300 to $1,700 per loan.

**Organizational Costs of IT Platform Development**

When an enterprise’s business model is IT-intensive in a hyper-growth environment, not only does it require 24x7 IT infrastructure uptime and customer support, but it also imposes massive application development requirements as the business environment changes and grows (see the above section on managing applications). Both Indymac’s business groups and IT groups felt organizational stress from the business initiatives in new customer markets and the new product lines that were IT-based and needed to be launched quickly. IndyMac was well aware of these pressures and took pains in recruiting, attracting, and incentivizing employees to work in such a high-tempo constant-change environment.

In addition, it would be naïve to assume that all projects will proceed the way they start. IndyMac had its share of aborted projects as technology platforms and tools for development were modified, business requirements were changed, new learning emerged, or new product lines were aborted due to environmental change. For example, several projects with partners in different parts of the mortgage industry ecosystem attempted to move toward an “all electronic mortgage” but were unsuccessful due to partners’ reluctance to embark on digitization projects.

**Strategic and Business Ecosystem Impacts**

Cumulatively, some operational impacts translate into strategic impacts. For example, IndyMac’s ability to offer competitive rates using its risk-based pricing for “mortgages with a twist” (that is, niche loan products) was one of the most important contributors to its market share increases.

**IndyMac Improved its Profitability Management Using Risk-Based Pricing.** The e-MITS engine and the electronic business processes around it let IndyMac Bank manage profits more precisely, which, in turn, limited its risk exposure while providing competitive prices – giving it a formidable strategic advantage.

This more precise profitability management came from e-MITS’ ability to accurately price at the front end in near-real time how much an individual loan would sell for on the back end, on Wall Street. e-MITS based the price on its risk on a loan-by-loan basis, rather than on the previous average-pooled basis. Thus, e-MITS provided an electronic link and some transparency between its customer base (Main Street) and loan securitization (Wall Street).

This link changed the loan processing paradigm from manually underwriting a loan to validating a loan.

**IndyMac Broadened its Customer Base.** e-MITS also allowed the then-upstart IndyMac to change its focus from approximately 50 large correspondent customers (1993-1995) to thousands of small mortgage brokers all over the U.S. This shift in focus increased its market share, and also moved it up the food chain to greater potential for profitability without incurring greater risk because e-MITS helped it manage the risk associated with smaller customers.

**IndyMac Improved its Response to Competitive Moves and Market Demands.** When the rapid, continual changes began to overwhelm the IT group’s capacity to respond, IndyMac moved responsibility for the rules in The Brain from IT to the business users. BRASS gave these users the tool for modifying the rules in real time. With this flexibility, IndyMac could change these rules more rapidly when regulations changed, new mortgage products were launched,
or competitors made market moves that required IndyMac to adjust its offerings.

**IndyMac Built an IT-based Strategic Advantage in Several Business Ecosystems.** IndyMac operates in three different business ecosystems within the electronic mortgage industry: loan acquisition, loan processing and funding, and loan sales (see Figure 7). These three correspond to its three “offices” shown in Figure 3. As explained earlier, most of the strategic gains from e-MITS were in the loan acquisition ecosystem, from the new processes and relationships with the new customer segments it generated. IndyMac also made strategic gains by linking the loan acquisition ecosystem electronically to the loan sales and securitization ecosystem on Wall Street, through its risk-based pricing.

IndyMac’s next strategic target for IT initiatives is the loan processing and funding ecosystem (the middle “office”). Management sees this ecosystem as the next competitive arena for the electronic mortgage industry because it is the biggest contributor to a borrower’s wait between ratelocking and funding. IndyMac views this process as the factory through which loans are manufactured.  

IndyMac’s strategy focuses on standardizing each task for manufacturing loans and granularizing them into multiple chunks of work that can be handled worldwide. The firm is currently digitizing paper documents, reengineering loan processing processes, making tasks more granular, and building the IT capability to leverage a global workforce.

By pursuing IT-based strategic advantages in all three business ecosystems, management expects to intermediate electronically across them, and thereby, continue to out-execute its competitors for many years to come.

**INSIGHTS AND LESSONS LEARNED**

IndyMac’s experiences demonstrate how to manage an IT-based business successfully in a turbulent environment – even when starting as a small firm in a staid industry. It also provides

1) lessons on managing an enterprise through IT in perpetual perfect storms, and
2) lessons on managing IT applications and operations in such conditions.

Here are the top ten lessons.

**Lessons on Managing an Enterprise in Perpetual Perfect Storms**

---

Lesson #1: Stay Steadfast on a Sharp, IT-Enabled Strategic Vision. The captains at the helm must have a sharp, strategic, IT-enabled business vision for the enterprise before embarking on an online journey in perpetual perfect storms – and they must be committed to the vision with single-minded conviction.

IndyMac experienced perpetual business storms from many directions and at many levels. These storms were both externally generated and beyond IndyMac’s control, and internally generated as a conscious choice.

Continuous storms require response, and they can be draining. That is why commitment to a strategic vision and conviction that it is right are so important. No matter how heavy the storm, an unwavering sense of purpose can guide responses to stormy episodes as part of everyday routines. IndyMac’s CEO’s and CTO’s conviction, that they could change the mortgage industry by providing superior value propositions through the strategic use of IT, enabled the company to continually sail toward its destination. While sometimes IT had to head directly into a storm, and sometimes it could do some strategic tacking around it, the firm never lost sight of its strategic IT-business vision.

Lesson #2: Do Not “Let Up” on Continuously Enhancing IT-Enabled Capabilities. Strategic advantage can be fleeting in perpetual perfect storms. Enterprises are only as competitive as their last showing.

There is no safe harbor from competitors in perpetual perfect storms, even when your own strategic initiative changed the rules of the industry. Competitors readily imitate such capabilities. IndyMac changed the rules of the mortgage industry when it launched e-MITS, and gained strategic advantage. It continues to add capabilities to stay ahead of imitating competitors. It must stay in continuous-improvement mode to re-

---

Figure 7: IndyMac’s Three Electronic Mortgage Industry Business Ecosystems

<table>
<thead>
<tr>
<th>Loan Acquisition Ecosystem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitors (who sell loans to IndyMac)</td>
</tr>
<tr>
<td>Mortgage Brokers</td>
</tr>
<tr>
<td>Builders</td>
</tr>
<tr>
<td>Consumers</td>
</tr>
<tr>
<td>Realtors</td>
</tr>
<tr>
<td>GSEs: Government Sponsored Entities (Fannie Mae &amp; Freddie Mac)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Loan Processing and Funding Ecosystem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verification suppliers (e.g., verification of employment)</td>
</tr>
<tr>
<td>Flood Insurance</td>
</tr>
<tr>
<td>Escrow Company</td>
</tr>
<tr>
<td>Appraisers</td>
</tr>
<tr>
<td>Title Company</td>
</tr>
<tr>
<td>IndyMac Verifiers</td>
</tr>
<tr>
<td>Lenders to IndyMac (for short-term loans)</td>
</tr>
<tr>
<td>Customers</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Loan Sales Ecosystem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Market Data Suppliers (e.g., Bloomberg)</td>
</tr>
<tr>
<td>Investors</td>
</tr>
<tr>
<td>3rd Party Due Diligence</td>
</tr>
<tr>
<td>IndyMac Servicing</td>
</tr>
<tr>
<td>Bond Trustees</td>
</tr>
<tr>
<td>Competitors (as investors)</td>
</tr>
<tr>
<td>Rating Agencies</td>
</tr>
</tbody>
</table>

Processes:
- Underwrite loans electronically from multiple channels
- Develop new products (often requires collaboration with GSEs)
- Price loans
- Rate lock loans

Processes:
- Process loans: Verify that loan characteristics match between electronic submissions and documents
- Close the loan
- Hedge risk on loans

Processes:
- Perform due diligence
- Sell loans
- Ship loans
- Service loans
- Maintain bond investor relations
main successful. While this lesson is not new, it becomes especially important in perpetual perfect storms because strategic advantages can be more fleeting than in more stable conditions.

**Lesson #3: Give up Direct Control to Gain Strategic Advantage.** To manage IT-intensive business models strategically in perpetual perfect storms, enterprises may need to invoke strategies that give them less direct control but more collaborative partnering across their business ecosystems.

IndyMac’s top management knew that the next battleground in IT-based strategy would be in areas where they would have less control. To sustain their competitive advantage, they needed more creative options. In the loan processing and funding ecosystem, for instance, management realized it could only improve its position by devising new process designs and IT platforms that would enable everyone in its market space to thrive. To do so, it needed to engage participants who were at very different levels of digitization maturity. Management also realized it would need to reconfigure its capabilities even more rapidly to handle the unprecedented levels of dynamism and complexity. It could only do so by sharing value with others in its business ecosystems, and by giving up full control over the ecosystem’s decisions.

Appendix A describes how “strategic repertoires” used by enterprises in strategy-making have evolved over the last 25 years. As the business environment became more turbulent and complex, the strategic scope expanded to broader business ecosystems, direct control decreased, and dynamism in strategic posture increased.

**Lesson #4: Realize that Smaller IT-Enabled Ships Can Influence Ocean Tides in Stormy Seas!** Perpetual perfect storms provide opportunities for smaller enterprises to change the rules of an industry by using superior IT-intensive business models and appropriate strategic postures.

Each era’s IT-based business models are suited to its business environment and level of turbulence. For example, in the mid 19th century,

> “The businessman of the present day must be continually on the jump – he must use the telegraph.” – New York Merchant, 1868

In today’s perpetual perfect storm environment, IT-based business models are more advanced, and the strategic options more dynamic. IndyMac Bank showed how a smaller enterprise can change the rules and gain strategic advantage in an established, old-line industry by using an IT-based business model and understanding how to manage in perpetual perfect storms. Thus, while the strategic options are many, the choice requires deep understanding of the options and their appropriateness to the environment (see Lesson #3 and Appendix A).

**Lesson #5: Don’t Expect to Eliminate an Ecosystem’s Digital Divide Quickly.** In a business ecosystem, IT-lagged participants create a “digital divide” among enterprises. In the short run, it is more effective to find ways to operate IT-intensive business models within this digital divide than it is to try to eliminate the divide.

IndyMac and several other mortgage banks considered implementing an all-electronic mortgage initiative, until they discovered the digital divide in their ecosystem. Some participants were highly electronic. Others were slow and paper-based, for example,

- Title companies do not digitize all their data. While digital title data is available in some large cities, the only way to perform a title search in some rural areas is to look through paper records at the courthouse. Furthermore, automating the title search may not be in the best economic interests of some participants because they make more money on inefficient processes.

- Although the Mortgage Bankers Association supports an industry-standard XML format (MISMO), some companies are reluctant to adopt it. IndyMac is a proponent of MISMO, but a project to use MISMO with one partner was scrapped because that partner did not yet support the format.

The digital divide in the mortgage industry makes it unlikely that this market can be fully digitized any time soon. The entire mortgage ecosystem would need to agree and act to make the process completely paperless. At this point, IndyMac can only chip away at the problem by automating paper-based portions. One example is to optically scan some documents. Eventually, the industry will need to close its digital divide to keep pace with consumer expectations. This lesson applies to all industries with a digital divide.

**Lesson #6: Seeing “IT as Fabric,” Woven into the Business, Requires a New Enterprise Mindset.** Seeing IT as being woven into the fabric of the enterprise, rather than as an environment or a tool requires a dif-
ferent mindset throughout the enterprise (including IT) about the business’ relationship to IT. See Figure 8.16

Over the past three decades, changing IT platforms changed the relationship between IT and the business (see Figure 8). In its early days, IT was viewed as a tool to the business, not necessarily integral to the business. In the 1990s, as network connections and the Internet became ubiquitous, employees saw themselves as being immersed in an IT-intensive business environment, where work processes and IT intimately influenced one another. In fact, often people could only connect with other enterprises and consumers through IT. Today, we see IT becoming indistinguishable from the enterprise because it is so integrally woven into the fabric of the enterprise. In this view, IT and work cannot be separated.17

IndyMac Bank illustrates a progressive enterprise that understands how to weave IT throughout the fabric of its organization. Management knows how to leverage this view at the corporate strategy level, at the IT strategy level, throughout the line divisions, and in the various IT groups. From the CEO on down, management has understood the strategic implications of IT being an integral part of the business. When IT is fabric, the concept of aligning IT with the business is moot: they are already inseparable. Strategy-making involves both, in tandem. In addition, when the business environment becomes more turbulent in perpetual perfect storms, and when IT is fabric, the IT team’s role and position are less separable from the business.

At IndyMac, the business culture is deeply ingrained in the IT development groups. IT staff spent much time learning and understanding the mortgage business and IndyMac’s strategy of combining and leveraging IT and mortgage expertise. The culture constantly inundates systems developers with the notion that they are business partners, not problem solvers and requirements translators. Their training sessions teach business models, not IT. In addition, business users are generally IT-savvy. This cross-training in IT and the business enables IndyMac to execute its IT-enabled strategies. There are no isolated technologists at IndyMac.

Lessons on Managing IT Applications and Operations in Perpetual Perfect Storms

Lesson #7: Nurture a Resilient IT Professional Culture. Managing strategically with IT-intensive business models in a hyper-growth enterprise requires nurturing a resilient IT professional culture that embraces working in perpetual perfect storms.

IndyMac is keenly aware of the pressures and constantly changing requirements its IT groups face. Management learned that it needed to carefully recruit, retain, and provide incentives to its IT professionals to keep the company up with the demanding environment. Management also needed to nurture a professional culture, where resilience, flexibility, and follow-through under pressure are valued and rewarded. Enterprises with similar conditions need to take these human resource issues into account, rather than assume that working in perpetual perfect storms means business as usual. It does not.

Lesson #8: Manage Simultaneous Loose/Tight Control of Applications Architecture. In perpetual perfect storms, the IT department and the business units need to manage the IT application architecture together, using simultaneous loose/tight control.

“You gotta know when to hold ‘em, know when to fold ‘em.”18 In perpetual perfect storms, the IT application management architecture requires simultaneous loose/tight control. The core of the IT application architecture needs tightly controlled specifications and requirements, and a disciplined approach to maintaining architectural unity as modifications are made. IndyMac’s tight, disciplined project management of the e-MITS Brain architecture is an example.

However, in dynamic turbulent environments, it makes no sense to have “IT joined at the hip with the new product development people on everything.”19 There needs to be “looseness” in the applications. Thus, the second major application, the BRASS application, allowed the business users to change mortgage underwriting rules and parameters in the software without IT intervention. The number and complexity of the underwriting rules increased, the frequency of changes accelerated, and the need to respond to competitors’ moves quickened. Routing the often-daily changes through IT would have been slow and inefficient. The strict architectural specification and modification discipline held the core tight.

17 Any attempt to separate IT and work will just yield finer granularities of IT-enabled work. Certainly, the move to Web services and service-oriented architectures is pushing us in that direction, as is the increasing IT intensity of business models in many industries.
18 In the words of country singer Kenny Rogers in his legendary song The Gambler.
19 Quote is from a senior manager in the secondary market business unit.
Meanwhile, the users could control the application to serve the business dynamically. With this tight/loose approach, the users could deal with their own storms without capsizing the ship. IndyMac made this loose/tight control of application management its architectural blueprint for all its environmentally sensitive applications. In perpetual perfect storms, all dynamic enterprises may need this loose/tight application management structure.

Lesson #9: Undertake Structural Change to Get IT Sustainability. Both business process structure and IT development roles need to be redefined to achieve sustainable, scalable change when an enterprise moves to managing online in perpetual perfect storms.

Moving from mainframes to n-tier architectures increased infrastructure componentization, smoothed out capacity expansion costs, and reduced lead time. However, doing so also increased application development costs. In most IT development budgets, application integration and re-integration escalate costs. These costs can be reduced, though, through modularization (through Web services and service-oriented architectures) and through increased use of skilled IT labor pools in countries such as India.

IndyMac increasingly takes advantage of application development outsourcing and is re-architecting its applications to be more modular and “Lego-like.” Smaller modules can be enabled and activated to form different, flexible configurations. But to create such an application development environment in its perpetual perfect storms setting, IndyMac had to rethink the structure of its business processes and the roles of its IT development professionals.

It divided its business processes into small activities so that at peak demand times, it can easily outsource application development work globally to people who have only a minimal amount of mortgage knowledge.20 At times of peak demand, competitors raid each others’ application development staff because these people know the domain (the mortgage business). This zero-sum game does not help the stability and prosperity of the electronic mortgage business ecosystem. IndyMac’s high-granularity approach allows much speedier development at peak times, and taps the broader labor pool of IT developers who have only limited mortgage knowledge.

---

20 Refinancing rushes occur when interest rates or legislation change.
To achieve this change, IndyMac’s developers needed to change their roles. Those who prided themselves on their technical prowess needed to become adept at analyzing business processes and writing functional specifications for offshore programmers. They also needed to learn how to modularize business processes and advise line division managers which portions of processes could be easily outsourced. We see their strategy for achieving sustainable, scalable change as a harbinger of things to come.

**Lesson #10: Slow Down to Go Fast.** For successful IT application development in perpetual perfect storms, it may be more advantageous to slow down to go fast.

IndyMac prides itself on a culture that can both change quickly and execute on its strategies. This discipline allows it to maintain inner calm while dealing with many storms simultaneously.

Initially, as a start up, working at feverish speed to get into the market, the IT development groups needed to take many shortcuts. In application development, its move to disciplined project management led to more predictable successes and fewer less-than-successful projects. The IT development groups’ driving principle is now “slowing down to go fast.”

**CONCLUSIONS**

IndyMac Bank is a story of strategic conviction, IT courage, and unwavering commitment to change and innovation. It set sail into a stormy sea that has become a sea of perpetual perfect storms. By weaving IT into the fabric of its business, and making innovative use of IT, it changed the ecosystems in its staid, old-line industry. In the process, it learned how to manage online in perpetual perfect storms in a sustainable way that will help it stay competitive in the coming years.

When IT intensity in an enterprise increases to the point where IT becomes part of the business fabric, and when the surrounding business environment increases in turbulence to the level of perpetual perfect storms, then the role and positioning of the CIO change. When IT is fabric, then the concept of alignment between IT and the business is a moot point: they are inseparable. The CIO’s business and IT roles become fused.

When an enterprise operates in perpetual perfect storms, then effective CIOs must learn to anticipate on their own, rather than react to someone else’s anticipation. They need to help mold and steer a robust IT-enabled strategic business vision and keep their eye on the destination.

IndyMac’s experiences are a harbinger of things to come in every industry. Eventually, perpetual perfect storms will hit every business and all IT systems. We hope the insights from this story better prepare you to steer your IT-enabled enterprise in the high seas – even when continuously broadsided by huge tidal waves.

**ABOUT THE AUTHORS**

**Erik Krogh**

Erik Krogh (erik.krogh@indymacbank.com) is First Vice President and Divisional CIO for Secondary Marketing at IndyMac Bank. Secondary Marketing is the business area that provides services to all IndyMac’s mortgage-related business units. He also oversees applications that support loan pricing, loan sales/settlement/delivery, and loan pipeline hedging. A multi-year program to reengineer Secondary Marketing processes and applications is now underway. He came to IndyMac in 1999, and was initially responsible for application development on e-MITS’ B2B Web site.

Krogh began his IT career in 1984, working in a variety of technical roles for companies ranging in size from small start-ups to large IT integrators, such as CSC. He previously held management positions at Hewlett-Packard and ARAMARK Uniform Services, where he was responsible for business-to-business electronic commerce initiatives. He holds an MBA from the University of Southern California’s Marshall School of Business and graduated Magna Cum Laude with a Bachelor of Science in Management from Pepperdine University. He is a Certified Mortgage Technologist, a designation awarded by the Mortgage Bankers Association.

**Omar A. El Sawy**

Omar A. El Sawy (elsawy@marshall.usc.edu) is Professor of Information Systems in the Information and Operations Management Department, and Director of Research at the Center for Telecom Management (CTM), both at the Marshall School of Business, University of Southern California. His interests include redesigning and managing IT-based value chains for dynamic environments, collaborative ecosystems, business process transformation, and the design of vigilant information systems for fast-response environments. Before assuming his position at CTM in 2001, his research projects have been sponsored by the RosettaNet Consortium and by Carnegie-Mellon University. As Director of Research at CTM, he oversees and leads an industry-sponsored research program that focuses on managing evolving technology platforms, wireless mobility, and partnering in new marketspace in the networked digital industry.
El Sawy holds a Ph.D. from Stanford Business School, an MBA from the American University in Cairo, and a BSEE from Cairo University. Prior to joining USC in 1983, he worked as an engineer and manager for twelve years, first at NCR Corporation, and then as a manager of computer services at Stanford University. He has lectured, consulted, and carried out research on four continents, has been an information systems advisor to the United Nations Development Programme in Egypt, and was a Fulbright scholar in Finland. El Sawy is the author of over 70 papers, and his writings have appeared in both information systems and management journals. He is the author of the book *Redesigning Enterprise Processes for e-Business*, 2001. He serves on five journal editorial boards, and is a six-time winner of the Society for Information Management’s Paper Awards Competition.

**Paul Gray**

Paul Gray (paul.gray@cgu.edu) is Professor Emeritus and Founding Chair of the School of Information Science at Claremont Graduate University. His current interests in information systems include business intelligence, knowledge management, data warehousing, and electronic commerce. Before joining Claremont in 1983, he was a professor at Stanford University, Georgia Institute of Technology, University of Southern California, and Southern Methodist University, where he taught in departments of industrial engineering and management science. Prior to his academic career, he worked for 18 years in research and development organizations, including nine years at SRI International. He is currently a Visiting Professor at the University of California at Irvine and is affiliated with its Center for Research on Information, Technology, and Organization (CRITO). He was editor-in-chief of the electronic journal *Communications of the Association for Information Systems* from 1998 to 2005.

Gray is the author of three “first papers”: in group decision support systems, in telecommuting, and in analysis of crime in transportation. He was recognized with the LEO award by the Association for Information Systems for lifetime achievement, the Kimball Medal of INFORMS, and the EDSIG Outstanding Information Systems Educator 2000. He is a fellow of both AIS and INFORMS. He was President of the Institute of Management Science in 1991-92. His Ph.D. is in Operations Research from Stanford University.

**APPENDIX A: THE EVOLUTION OF STRATEGIC MANAGEMENT APPROACHES**

Strategic management concepts in the 1980s and early 1990s presumed that gaining strategic advantage required direct control and a focus on the enterprise. Porter’s 1980 classic *Strategy as Positioning*<sup>21</sup> centered on how to gain positional advantage in an industry by erecting barriers to market entry by competitors. Porter was followed by Stalk and Hout’s 1990 *Strategy as Movement*,<sup>22</sup> in which strategic advantage was gained by speedy and superior business process execution, and fast response management. Strategy extended beyond the enterprise to end-to-end horizontal business processes from suppliers to customers. Also in 1990, Prahalad’s *Strategy as Capability*<sup>23</sup> viewed the source of competitive advantage as residing in the enterprise’s inherent acquired skills, knowledge, and expertise that could be translated into unique capabilities and competencies.

As the business environment became more turbulent, dynamic, and complex, strategic options extended to cope with perpetual perfect storms. These strategies have involved more complex dynamism and less direct control: the ship would have to learn how to reconfigure to roll with new types of waves, and to collaborate better with other seafarers and marine life, intelligently and continually. In 1997, Teece’s view of Strategy as Dynamic Capability<sup>24</sup> showed that strategic advantage could be gained by building and reconfiguring competencies quickly, and moving resources into new ones. We also better understood how IT could enable agility<sup>25</sup> and dynamic capabilities.<sup>26</sup> By 2003, enterprises began to emphasize *Strategy as Supply Chain Synchronization*, where the core strategic approach was to synchronize supply collaboratively with fluctuating demand in dynamic supply chains. This strategy was increasingly accomplished through electronic business processes, process integration


Most recently, this view was extended to Strategy as EcoPartnering, in which an enterprise exercises less direct control but needs to coax mobilization of resources in its broader business ecosystem. Strategy in this view increasingly involves managing assets and resources that an enterprise does not own or control. It also involves providing business and IT platforms that others in the ecosystem can leverage. The idea is that in hyper-turbulent environments, with many disruptive technologies and new market spaces, it is necessary to partner empathetically for the ecosystem to thrive and dynamically stabilize because perpetual perfect storms keep forming. Eco-partnering involves both creating value and sharing value.

Figure 9 shows the shift in strategic postures over this timeframe, as environmental turbulence levels increased. The nuances are important to understanding how IndyMac views IT strategy as it faces the future.

---