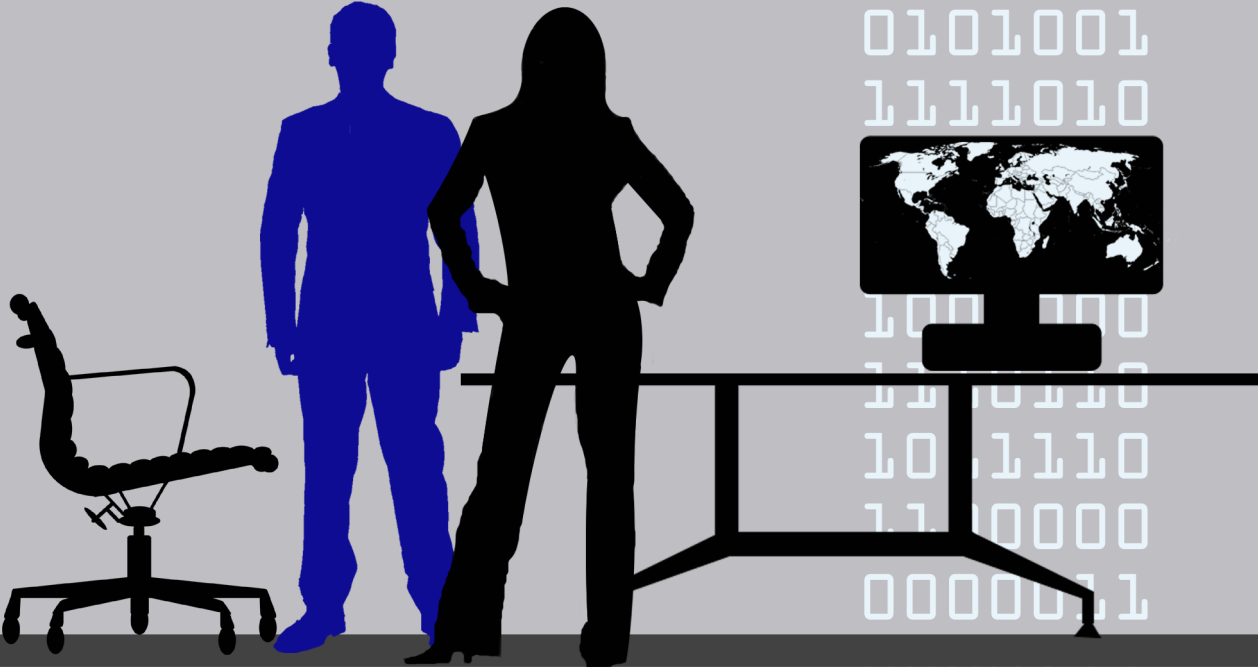


The Second Generation Board Portal

BoardVantage
Security with Simplicity



Background

Shortly after passage of the Sarbanes-Oxley act, tech-savvy companies began to experiment with simple board portals to provide basic online document access to their directors. Simultaneously, seeking to capitalize on the mini-spending boom triggered by the law's introduction, a handful of software vendors announced commercial portal implementations. Little meaningful difference existed between the first commercial portals and their homegrown counterparts, as they both relied on a simple extranet architecture.

As customers attempted to deploy these systems, it became quickly apparent that their rudimentary architectures were inadequate to accommodate the scope of board work as practiced in the F-1000, particularly as an ever-greater emphasis on compliance increased the complexity of board work. Before long, frustrated by functionality and usability limitations, these early board portals fell in disuse, and the movement behind homegrown and early commercial board extranets lost steam.

Emergence of the Second Generation Board Portal

However, faced with an increase in board duties and committee meetings, and driven by the desire for more timely communication, underlying director demand did not disappear. And as the pace of board work quickened, the value of a productivity tool and "always-on" access to board materials became increasingly evident, particularly in large companies. Unfortunately, the existing portals fell so far short of customer requirements that the demand remained unsatisfied.

As an early market entrant, BoardVantage became intimately familiar with this latent demand and the need for a new generation board portal which offered greater functionality, ease-of-use, and a level of security that could meet the standards of global financial institutions.

To validate assumptions and assure that we possessed a grasp of the nuances, the company launched an in-depth study of board processes, the center piece of which was an 18-month dialogue with a group of Fortune-1000 customers whose practices fairly represent the larger market. This research led to the redefinition of the board portal space and the specification of radically new product architecture.

This paper discusses the attributes of the BoardVantage 2nd generation portal, its key

success factors, and its emergence as a governance tool for the F-1000.

Market Drivers

The Changing Nature of Board Work

Traditionally board work in the F-1000 has been limited to quarterly in-person meetings, but that dynamic changed after the passage of the Sarbanes-Oxley act. The pace of board communications quickened, there was growing scrutiny by regulatory agencies and the sheer number of board duties increased. In other words, the very nature of board work was in flux. This contextual change developed surprisingly quickly, perhaps over a span of 24 months. Material differences between 1st and 2nd generation portal architectures can be traced back to that inflection point. The 1st generation, launched before the changes were manifest, had a very modest objective; the 2nd generation, defined after the nature of the changes had become clear, was far more ambitious.

Support for the Scope of Board Work

Whereas 1st generation portals were designed purely for online document access (the sole requirement before the shift), the 2nd generation architecture aimed for Web migration of all board process. But because board process had grown remarkably diverse, only an application suite that addresses the full scope of board work would put boards in position to transfer their process online. Without commensurate breadth and depth director adoption would inevitably lag. The scope of a 2nd generation portal includes sophisticated

support for meeting process, but also automation of process that takes place in between meetings. The importance of the latter is driven by the growing need for greater responsiveness to events that occur between meetings and are frequently difficult to anticipate. Examples include M&A transactions, natural disasters, and even operational events of public interest.

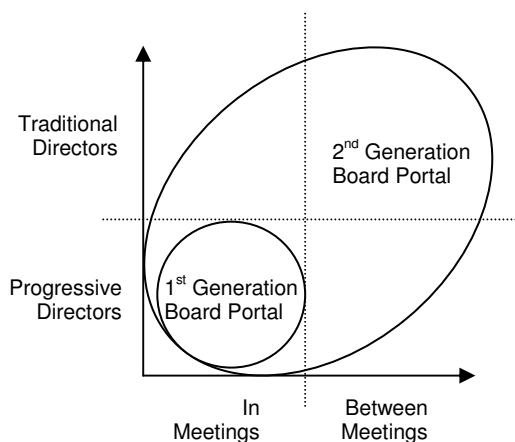


Figure 1: Functionality – 1st and 2nd Generation Portals

To address these diverse requirements the 2nd generation suite incorporates a dozen product modules, each tailored to a specific board process. They include:

Online Access: Access all board materials from anywhere

Notification: Receive alerts via email, PDA or voice when new content available

Searchable Repository: Access current or archival board materials with full-text search

Access Control: Selective access for individual directors or committees

Offline Access: Store encrypted documents in password-protected folder on desktop for offline review

Document Markup: Add personal notes to materials online and offline

Consents: Simplify review and act on board consents

Evaluations: Point-and-click board evaluations and director questionnaires

Conferencing: 1-click conferencing to add a visual element to voice conferences

Secure Messaging: Directors exchange messages confidentially

Central Address Book: Up-to-date source for director contact information

Shared Calendar: Up-to-date source for board and committee events, which is role-based

Security	
In Meetings <ul style="list-style-type: none"> ▶ Online Access ▶ Repository ▶ Notifications ▶ Offline Access ▶ Document Markup ▶ Access Control 	Between Meetings <ul style="list-style-type: none"> ▶ Consents ▶ Web Conferencing ▶ Evaluations ▶ Secure Email ▶ Centralized Contacts ▶ Shared Calendar
Ease-of-Use	

Figure 2: Director Application Suite

Director Adoption

Also incorporated in the 2nd generation definition was the all-important notion that expansion in functionality cannot come at the expense of greater complexity. The demographics of F-1000 boards dictate an extraordinary emphasis on usability, far beyond what's expected in any other business application, but 1st generation portals vendors did not address these requirements adequately. Although ease-of-

use had been recognized as a driver for adoption, the amount of innovation and UI engineering required had been underestimated by 1st generation vendors. In the rush to market, commercial offerings were nothing more than simple variants of general-purpose extranets, devoid of the human factors engineering required for corporate boards or the nuances involved in board work. As a result director adoption suffered. The 2nd generation portal has made adoption a design criterion and has enjoyed the expected success; a fact that is amply demonstrated by the surge in demand.

A view of director adoption also needs to take into account that every board is comprised of traditional and progressive directors. If the portal is to succeed, neither constituency can be ignored. To address this spectrum of technical literacy, the BoardVantage Application Suite employs a twin-track approach: rich enough to satisfy the sophisticated requirements of progressive directors, but user-friendly enough to successfully engage traditional directors. For example, a progressive director can securely save documents and annotate with private notes offline; whereas, a traditional director may limit his use to access online or print out a document for review offline. This twin-track model is carried through the application and provides traditional and progressive directors with the approach that serves their needs best. This combination is critical to drive director adoption.

Corporate Secretary Productivity

A distinct but equally important need was identified in regards to the Corporate Secretary's Office. This team is responsible for aggregating, organizing and disseminating all board materials. Without a tightly-managed CS operation, board communication simply grinds to a halt. Although not always appreciated by outside observers, extensive planning, coordination and painstaking execution is required to keep the process running smoothly.

To guarantee a successful migration online, this process, in all its particulars, needs to be captured in vertical workflows or an unmanageable burden is placed on this already heavily-loaded team - a key reason why numerous 1st generation initiatives never came to fruition.

Contrary to popular belief, this demands sophisticated functionality, encompassing a degree of difficulty that is analogous to what is found in commercial Web content management applications. This workflow functionality, absent in the 1st generation, but integral to the 2nd generation, lets the Corporate Secretary Office create and distribute materials before board meetings but also automate all process that takes places in between meetings.

This translates into a significant efficiency boost in all aspects of board communications for the Corporate Secretary. Also, although the technology is sophisticated, the user

interface needs to be designed so that the team can operate independently, without reliance on internal IT. In order to cover the CS process end-to-end, a range of functionality is required:

Drag-and-drop: Upload documents from desktop with single click

Auto-conversion: Convert any number of documents to PDF, automatically, irrespective of format or size

Auto-update: Replace, insert and update documents order at the last minute

Auto-collation: Two-step process for assembly of any number of disparate documents

Board book creation: Automated process for board book creation and distribution

Role-based distribution: Maintain control over document access

Consents dashboard: Dashboard and workflow for managing consents

Evaluations dashboard: Distribute, track and tabulate board evaluations and questionnaires

Conference dashboard: Dashboard for managing Web conferencing (queue, roll call, pointer)

Notification: Notify directors when items need immediate attention

Central address book: Provide up-to-date source for director contacts

Shared calendar: Provide up-to-date source for board and committee events, role-based.

Secure Ubiquitous Access

One of the key advantages of board portals is that they permit Corporate Secretaries to

deliver sensitive files at any time to a busy itinerant demographic, regardless of location, whether they are at home, traveling on business or on vacation.

But there are other compelling benefits relative to security. For example, all board material is maintained centrally, on a single server. Thus, board portals can simplify the increasingly complicated task of identifying and preserving all relevant electronic data and documents. In addition, from a litigator's perspective, board portals can serve a crucial function in eliminating documents and emails in the ordinary course of business that could otherwise be fertile ground for discovery and provide the basis for embarrassing or damaging admissions against the corporation and its board members. Also, board portals assist in centralizing document retention by board members, with obvious advantages. The need to canvas files, computers and other data sources maintained by directors at their homes or businesses during discovery, often on an expedited or repeated basis, can be minimized or even eliminated if document sharing is contained within the portal.

But in order for these benefits to be realized, a set of requirements, largely missing in 1st generation portals, was specified in the 2nd generation architectures:

No vendor access to customer content:

Because a third party hosts the portal at its data center, it is essential that the portal architecture does not permit vendor access to customer board content.

No director use tracking: For a variety of reasons, including board members right to privacy, the portal should not track, or in any other way, audit director use.

Purging of deleted data: Any and all deleted data should be purged from all servers and backup media.

Role-based security: Access to materials should be programmable so that it can be targeted to individual board members or committees, as well as specific time frames. This latter can be useful when bankers or other outsiders need access to specific documents during particular periods of time.

Secure messaging: The portal should include a closed-loop alternative to desktop email, only accessible to board members, so that directors can discuss sensitive subjects, such as compensation or M&A activity without risk of an information leak. The architecture should permit a full and complete purge of individual email messages so that emails that are fertile ground for discovery in litigation can be eliminated.

Enforcement of retention policies: Corporate retention policies can run the gamut from “preserve everything” philosophy to the view that less is more. Regardless of where a particular corporation’s policy falls on this continuum, board portals should be able to enforce these policies.

Remote purge: The portal should be programmable so that any downloaded

documents can be automatically purged from a director’s laptop.

Secure ubiquitous access: Authentication should be a two-factor implementation; be easy enough for traditional directors and support access from any PC, not just the director’s personal laptops.

Second generation portals are differentiated from their predecessors in that the architecture supports these key considerations. Moreover, vendor process should be transparent so that customers or their auditors can verify vendor all essential element of the process to their satisfaction.

Governance Benefits

Post-Sarbanes-Oxley boards have come under pressure to respond to the changing nature of board work. They include greater scrutiny, a quickening in the pace of board work and the geographic dispersion of directors. Boards are eager to respond, but they struggle with logistical and communication challenges. 2nd generation portals equip directors with tools to address these unprecedented challenges and provide tangible benefits for governance:

Increased Visibility

Good portal design makes information access easier than traditional paper-based methods. Current meeting material is a click away while hyper-linking allows scanning of subject headings followed drilling down where necessary. Powerful search tools allow directors to retrieve archival documents for benchmarking - on the spur of the moment.

While these attributes were present in good 1st generation portals, they were insufficient to improve visibility because backend considerations were ignored. This critical weakness was addressed by 2nd generation portals through the automation of information distribution, which enables frequent updates from management but without placing an unreasonable burden on the executives responsible.

Examples:

- Single-click access to confidential documents.

- Quick lookups of archival documents with a full-text search engine that scans content for relevant key words

Personal Productivity

With sophisticated alerting functionality, all board information is available faster and in a more timely fashion, even while traveling. Also, improved access is no longer restricted to documents. On 2nd generation portals it includes board process such as self-evaluations and written consents. Complex process has been captured in the application, with business rules to guide workflow, dashboards and time-stamps to monitor progress, all in support of migrating paper processes online for higher personal productivity.

Examples:

- Notification of any new updates is accomplished via regular email, PDA or voice alerts.
- Use of Permalinks brings directors immediately to the documents in question.
- With Annotation directors mark up board documents with personal notes in preparation of the meeting.

Asynchronous Collaboration

Increasingly directors are expected to communicate in between meetings, but, without a portal, it is not always possible, let alone convenient to communicate in real-time. By including asynchronous collaboration tools, 2nd generation portals let directors

carry on board duties efficiently in between meetings.

Examples:

- Using Approvals, directors give written consents online, and, as appropriate share comments with other board members.
- With Secure Web conferencing directors continue discussions online, in a meeting that was started offline.

Codified Best Practices

A 2nd generation portal allows the General Counsel to codify best practices and engineer in business rules that stand up to external scrutiny. Also new, potentially cumbersome process, introduced under new rules or regulations can be automated quickly.

Examples:

- For option exercises the BoardVantage Portal provides automated workflows with timestamps.
- In the area of questionnaires, directors complete surveys online, while the system tracks tabulates results.

Corporate Secretary Efficiency

BoardVantage lets the Corporate Secretary take full control of the unwieldy process of managing board content.

Examples:

- Organize and distribute board content with vertical workflows and centralized dashboards.
- Create an online agenda automatically, and compile a personally customized board book all in a matter of minutes.
- Implementing last minute updates to documents is easy with the “Replace” functionality which steps the Corporate Secretary through the document replace and the related board books update automatically.

Challenge	Solution	Benefits
Quickening Pace	Familiar Tools	Improved Responsiveness
Geographic Dispersion	Asynchronous Collaboration	Greater effectiveness
New Process	Automation: Engineer in rules	Process control and efficiency

Figure 3: Challenges and Solutions in the post-Sarbanes-Oxley Environment

Security

By definition, board material is highly confidential and BoardVantage has invested heavily in an architecture which addresses all relevant aspects of service security including product, process and people.

Product Aspects

Starting with our 1.0 product release, security has been an overriding design objective. Consequently, security considerations permeate every aspect of our application. The major components of the BoardVantage multi-layered security model include:

Hardened data center: The BoardVantage application is hosted in a secured data center that is SAS70 Type II certified. Access to hosted systems is limited to the BoardVantage Network Operations staff and granted only to listed employees identified by picture ID and biometric handprint scan.

Encryption: All content stored on BoardVantage is protected by data encryption, both during transmission and when at rest. BoardVantage partitions data into separate databases, accessed by separate connection pools, using separate user accounts and different passwords. Logical protection is achieved using a randomly generated, customer-specific encryption key.

Two-factor authentication: Today, single-tier authentication using IDs and passwords are particularly vulnerable to hackers. The

Federal Financial Institutions Examination Council, a standard setting group for banks, stipulates the move to two-factor authentication for online-banking security. BoardVantage has already built in this higher level of security, adding certificates as a second factor authentication.

No unauthorized viewing: All customer data is encrypted using inaccessible encryption keys, so that BoardVantage staff has no access to the content. Role-based security in the application lets Corporate Secretaries control access to documents including print and save options by groups or individuals.

Secure Email: The BoardVantage portal incorporates a closed-loop email network which is only accessible to the board and the Corporate Secretary Office. All email messages are encrypted and purged upon deletion. Also, all deleted data is purged from the backup media within 48 hours. This guaranteed deletion means that no inadvertent copies of email remain on backup tapes or relay servers.

People Aspects

Acting on the belief that a security infrastructure will only be effective if it evolves and adapts to the changing threat environment, BoardVantage employs a dedicated staff of security experts who constantly assess risks, address vulnerabilities and evaluate current and potential threats. Our staff stays abreast of all threat and vulnerability notices posted by US

government agencies, infrastructure software vendors, and Internet standards bodies.

The BoardVantage security team is led by a CSIPP-certified veteran with direct experience in deploying highly available, secure networks in mission-critical environments including financial services, high technology, government, and law enforcement.

Process Aspects

All aspects of our security have been documented and all parts of our process have been audited by third parties, which include the security teams of the largest banks and financial institutions in the US. Also, to ensure that proper controls are in place for provisioning and change control, and that separation of roles and responsibilities is strictly enforced, our processes have been independently SAS70 certified. BoardVantage welcomes security audits from prospective customers, and usually carries out 2-3 per month.



Figure 4: 3rd Party Security Audits

Service Operation

In addition to high-caliber application engineering, 2nd Generation board portals require deep expertise in network security, datacenter operations and application hosting. This combination presents a non-trivial technical challenge but also offers a unique opportunity for product differentiation.

Performance

BoardVantage employs modern network architecture to assure high performance even as usage scales exponentially with customer acquisition. Excess capacity has been built in to handle spikes in usage. BoardVantage includes service level agreements in our contracts.

Uptime

BoardVantage deploys redundant network stacks, so that every primary server stack is backed up by a secondary stack in a load-balancing configuration. In the event of an unplanned outage the service from the primary is designed to roll over to its secondary companion stack. Also, BoardVantage maintains a hot standby facility in a geographically remote location. We also have in place an actively maintained and tested business continuity plan.

Backup

BoardVantage has documented backup procedures. We perform a nightly full backup of encrypted customer data. Backup tapes are maintained in a secure server room with restricted access. Expired backup tapes are destroyed to prevent any possible unauthorized access.

Staff

BoardVantage has a staff of experienced operations professionals, who monitor and manage network performance and system uptime 24x7.

Account Management

The Account Management Team is the focal point for all customer contact. This team is responsible for successful implementations as well as ongoing technical support and customer assistance. The team comprises account managers and account support reps.

Account Managers

Every new BoardVantage account is assigned a Senior Account Manager. In order to qualify for this position, the individual has successfully led twenty-five customer engagements and has experience of 24 months in the Account Management role. The Account Management Team is led by the Vice President of Account Management.

Customer Support

Also reporting into the Vice President of Account Management is a team of Account Support reps. Structured as an overlay team, they are responsible for any customer assistance questions on a 24x7 basis. Account Support works closely with the Engineering Team and individual Account Managers to resolve all customer issues quickly and professionally. The Support Team tracks the number of outstanding customer cases and monitors case response time against internally set goals.

Customer Requests

BoardVantage has a track record of working closely with the customer base to incorporate enhancement requests in our product plan. We proactively solicit input and prioritize enhancements with our customers through discussion in the BoardVantage Leadership Circle, a core group of customers who meet regularly to share best practices and collaborate with BoardVantage on product ideas. After the roadmap is updated, we review our roadmap with customers as part of the planning cycle.

Proven Practices

Experience shows that proven practices are critical success factor in successful board portal implementations. But as in any other emerging market, today board portal domain expertise is a scarce commodity and proven practices are not widely available.

As a first-mover in the market, BoardVantage recognized its importance early and invested in studying the boardroom processes of a core group of Fortune-500 customers. Subsequently the collective experience of our customer base was translated into a Proven Practices program.

The common format of our Proven Practices program and its structured methodology provides a framework for adoption that companies can build on. This full set of expertise includes scenarios, workbooks, checklists, Tech-Tips and user guides.

Customers leverage this know-how to migrate board process from paper to Web in a predictable manner.

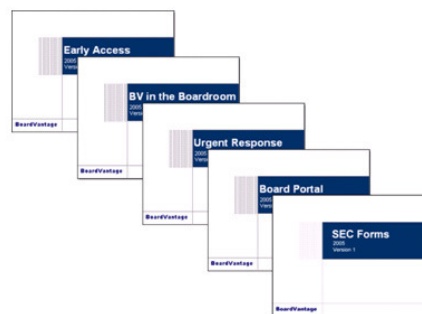


Figure 5: Proven Practice Guides

Our Account Managers work with our customers to customize the implementation plan, determine a roll-out sequence, and provide 1-on-1 training sessions to directors, executives and the Corporate Secretary office. Using timelines established by the customer, account managers establishes a controlled migration path to ensure that expectations are set properly and that the roll-out goes as planned.

Portal Partner Success Factors

For vendors, rapidly expanding customer requirements have transformed the market dynamic. When the market was in its infancy, and vendor implementations were standardized around a basic extranet architecture, differentiation on the basis of technology was not viable. In effect technology had taken a back seat to marketing. This changed with the advent of the 2nd generation portal. Success in the board portal space now rises or falls on product innovation. Only if a vendor delivers director-friendly compelling functionality and a high level of security is success assured.

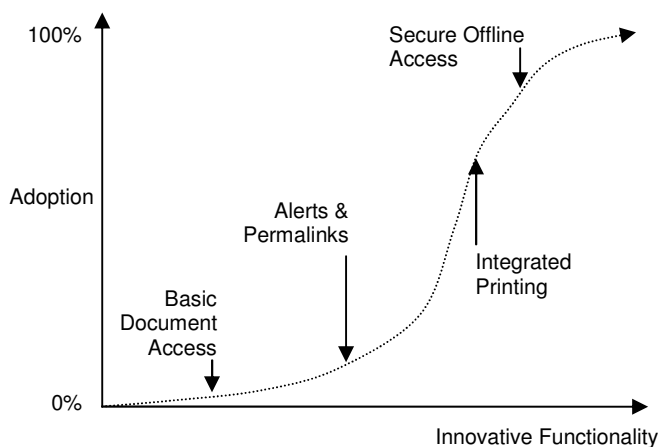


Figure 6: Innovation and Director Adoption

Also, as the benefits of introducing technology to board work become generally recognized, customers now expect a constant stream of new features and functionality. This shift has raised the stakes in the market, because the emphasis on innovation is costly, and most market entrants had not anticipated the capitalization requirements of these new

demands. Other new factors have emerged as well, all essential to long-term success in the market place. The following summarizes these criteria and discusses how BoardVantage performs against them:

High-Caliber Engineering

An emphasis on product innovation triggers the need for experienced, high-caliber engineering. This expertise is scarce and concentrated in a few software development hotspots around the world. Although outsourcing from Asia-Pac is a powerful and respected trend in software development, it is unsuitable for board portal development because of the rapid development cycle and the pace of innovation required.

Because BoardVantage is located in the Silicon Valley, engineering and product management staff are recruited from a pool of world-class technology companies and renowned educational institutions. The team has filed multiple technology patents and has employed the most sophisticated security infrastructure available commercially.

Focus

In board portals, domain expertise is critical for success, but, because boards are a cloistered environment, acquiring this expertise is non-trivial.

BoardVantage was funded to develop the market for board portals and invests all its

engineering resources on board portal product development. Our ability to concentrate our executive team's attention on a single target market and make a sustained level of investment has proven instrumental in evolving the product in lockstep with customers.

Customer Connection

A dynamic business environment and a rapidly evolving regulatory environment are bringing about dramatic changes in the nature of board work. To keep up with these expanding requirements, a rapid pace of innovation is essential, which in turn demands on extensive customer input.

As the portal partner for the boards of some of the most prestigious companies in the world, BoardVantage understands the changing nature of board work and how to address the respective challenges faced by boards and their Corporate Secretary office.

BoardVantage has a track record of investing to meet customer needs. Recently a Fortune-100 telecommunications customer submitted a list of 85 product enhancements.

BoardVantage implemented all but 5 of these requests within 9 months. Not only was this particular customer delighted, with the speed of the response, but the general customer base reaped the benefits as well.

Moreover, by establishing a direct formal relationship with a select group of marquee customers, BoardVantage stays abreast of the

changing environment so as to incorporate their emerging best practices into portal workflows. This working group, the BoardVantage Leadership Circle meets by Web conference on a regular basis to review upcoming functionality improvements and collect feedback on recent enhancements. Also, the open discussions create an environment where customers discover better ways of using the portal, while BoardVantage staff gains a stronger grasp of customer use cases leading to superior feature and function designs. Over time the forum's charter has been expanded to discuss governance trends. Outside speakers are now invited on a periodic basis to cover topics with particular relevance to the changing boardroom environment.

Because there are many factors to consider, the selection of a board portal should be made with great care. New markets are rife with misunderstanding, so it's easy to arrive at a suboptimal decision, which the customer will inevitably regret. So, in addition to the self-evident product criteria of security, functionality and ease-of-use, companies evaluating board portals should pay close attention to vendor success, as expressed by customer loyalty, market momentum and vendor transparency, before deciding on their portal partner.

These factors can serve as invaluable proxies and will make a potentially intimidating process simpler and less time-consuming.

Market Direction

Despite the fact that commercial board portals have been available for several years, the market had been constrained because deficiencies in 1st generation portals architecture. Although vendor offerings were superior to homegrown implementations, as a whole, the class was flawed and customer success elusive. The introduction of the 2nd generation portal with its redefinition of purpose and radical redesign has addressed these issues successfully. This evolutionary path is not uncommon in emerging technology markets.

It is now likely that board portals will follow the typical trajectory of markets shaped by the introduction of discontinuous technology¹. As the market matures and customers realize tangible benefits, the product is specified as an integral part of the business process and the market opens up. During this process successful vendors will foster a great deal customer loyalty through successive introductions of compelling product features, further increasing customer benefits.

With the availability of these 2nd generation portals the attitude of boards towards technology has also begun to change. Directors are now able to take advantage of the efficiency, speed and control that good Web technology offers, increasing their personal productivity, and improving visibility into the company's business.

Simultaneously, the permeation of technology in the culture is becoming stronger. Social interactions are becoming increasingly technology-centric. Boards realize that a decision to remain paper-based in a Web-based world puts them at risk of being out-of-touch with the companies they govern and the markets they serve. Needless to say forward-looking companies have no intention of being left behind as is evidence by the fact that almost 100 boards, half in the F-1000 are using a 2nd generation portal from BoardVantage today.

¹ Crossing the Chasm, Geoffrey A. Moore, Harper Business Essentials, 2002

About the Author

Joe Ruck is the President and CEO of BoardVantage. Previously he was Senior Vice President of Marketing for Interwoven (NASDAQ: IWOV) and part of the team that drove Interwoven through on one of the most successful IPO's of 1999. Previously, Joe held a number of sales, marketing and executive positions at Sun Microsystems (NASDAQ: SUNW), Network Appliance (NASDAQ: NTAP) and Genesys Telecommunications, subsequently acquired by Alcatel (NYSE: ALA). Joe holds a BS in Engineering from Oregon State University and an MBA from the University of Santa Clara.

About BoardVantage

BoardVantage is the leading provider of 2nd generation board portals, with clients across multiple industries and in all sizes—including over 20 Fortune 100 companies. BoardVantage provides a secure and user-friendly Web portal for centralizing confidential documents, processes and communications. The company also provides productivity tools for populating the portal and workflows for managing board process such as written consents and director questionnaires. BoardVantage is SAS 70 Type II certified, and meets or exceeds the standards of the most security conscious IT departments, including those of major financial institutions.

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