The purpose of this paper is to explore the value impact of leveraging a Data Center 2.0 strategy. Specifically, it serves to provide CIOs and senior IT managers a prescriptive guide to realize their own strategic value model by employing a Data Center 2.0 strategy.

Executive Summary

A new digital reality is transforming every organization in how it connects, transacts and collaborates with customers, partners and affiliates. This can be seen across all industries, organization types and societies. The way enterprises conduct daily business has been transformed thanks to today’s real-time, always-on digital world. Successful businesses are merging the legacy offline and online worlds to change how they deliver value for customers and shareholders.

In “Data Center 2.0 – Delivering Business Value, A Strategic Framework for Change,” Tony Bishop gives a practitioner’s perspective on this key data center strategy. Bishop was Chief Strategy Officer for The 451 Group and Global Head of Enterprise Datacenter Operations & Strategy at Morgan Stanley.

Bishop contends that firms that focus their investment and business strategy on data center operations will realize differentiated capabilities in the digital world in contrast to those who do not. The reasoning is simple: If the digital capacity cannot be delivered in a manner that is conducive to successful business execution, then the business strategy fails.

Enabling firms to address this transformational challenge is the evolution of a value-driven technology strategy known as Data Center 2.0. This strategy creates a capacity fulfillment capability that can adjust to business and market dynamics while providing optimization and flexibility at the same time.

Bishop explores the impact of leveraging a Data Center 2.0 strategy. He offers CIOs and senior IT managers a framework for realizing the benefits of a software-defined data center and closing the strategic value gap.
Call to Action

Today’s enterprises face a critical and common dilemma: how does one drive business performance and realize value from large-scale investments in technology-enabled change? The process requires investments to be selected, prioritized and sequenced carefully.

Elsevier Science’s Journal of Information & Management conducted a study on the relation of the IT Infrastructure investment orientation (strategic or utilitarian) employed by the CIO and the resulting economic performance. Those firms that employed a “strategic” investment orientation towards infrastructure had an average return of 25% higher on each dollar invested. Moreover, those firms that enjoyed faster time-to-market were able to charge premium prices and had higher revenue per employee along with a lower percentage of operating expense associated with IT. ¹

However, a major imbalance impedes this investment selection, prioritization and strategic process: the imbalance between business demand and IT fulfillment. Business demand on IT is becoming more complicated due to the explosion in velocity and quantity of data. The ubiquity of devices and the always-on digital world creates insatiable demand for content, data and instant knowledge. The resulting growth rates in information processing and housing are difficult to sustain.

On the supply side, IT capacity is fulfilled via its data center infrastructure. The traditional IT capacity investment and delivery model was not built for this demand explosion. It was built to provision capacity over long time horizons in a one-size-fits-all approach with static service levels. The investment strategy was historically a one-size-fits-all approach.

Leading CIOs are now shifting their technology investment strategy to one that matches capacity fulfillment to the consumption sensitivities of unit cost, performance, length of capacity need and security attributes. This strategy—known as the Data Center 2.0 Value Model—addresses total cost of ownership while achieving greater flexibility to scale and support business operations. It provides the framework to enable the realization of both optimal performance and the value of enterprise IT.

The following paper has been commissioned by IO and incorporates industry benchmarking of IO customers as well as specific Data Center 2.0 business value research by the author over the last three years. The intent of the paper is to help organizations understand a Data Center 2.0 strategy and how to derive maximum impact from leveraging such a strategy. The paper will also cover the value a Data Center 2.0 strategy creates; the specific value levers that can be employed; the specific capacity delivery models that can be exploited utilizing a Data Center 2.0 strategy; how the IO technology platform enables a Data Center 2.0 strategy and what the business case looks like using IO and a Data Center 2.0 strategy.

¹ Elsevier Information & Management: 0378-7206; Marion G. Sobol & Gary Klein
Why a Data Center 2.0 Strategy?

The industry research for this paper found that leading CIOs are revamping their investment strategies to address the limitations of their IT infrastructure and unlocking differentiated business value through the data center.

One of the key strategies that CIOs are employing to unlock significant hidden value is – Data Center 2.0.

Research Definition – Data Center 2.0 provides a just-in-time capacity delivery model providing as needed, when needed response. It also enables allocation of power, cooling and space based on each application’s need for availability. Specifically, a Data Center 2.0 approach to capacity delivery fundamentally changes the rules of competition and accelerates cumulative business performance. When leveraging a data center as a platform approach for dynamic capacity delivery to the business, firms are able to enhance customer engagement and improve decision-making, while lowering the cost of goods sold.

It was found that Data Center 2.0 creates a value framework that provides both strategic and economic transformational context.

<table>
<thead>
<tr>
<th>Strategic Impact</th>
<th>Economic Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategically, a Data Center 2.0 value-driven strategy enables:</td>
<td>Economically, a Data Center 2.0 value-driven strategy enables:</td>
</tr>
<tr>
<td>• Variability of capacity fulfillment</td>
<td>• Elimination of waste</td>
</tr>
<tr>
<td>• Velocity of capacity fulfillment</td>
<td>• Reduction in unit costs</td>
</tr>
<tr>
<td>• Control over capacity fulfillment</td>
<td>• Reduction of capacity footprint</td>
</tr>
<tr>
<td>• Discrete, software-defined units of data center capacity per service request</td>
<td>• Speed of cost reduction</td>
</tr>
<tr>
<td>• Pay-per-use/as-you-grow consumption model</td>
<td>• Up to a 30% reduction of IT costs</td>
</tr>
<tr>
<td>• Risk and compliance adherence</td>
<td>• Meaningful increase in pre-tax margin</td>
</tr>
</tbody>
</table>

The Value Data Center 2.0 Creates

Firms interviewed for this paper collectively stated that a Data Center 2.0 strategy creates value in terms of:

• Complementary deployment and delivery model
  The data center deployment and delivery model mirrors the direction and pace of the business, while delivering against a set of technical requirements such as growth, rationalization and agility.

• Flexibility in optimization
  A firm’s data center strategy must handle variations in workload, service level, vendors and devices. It should also closely match the investment and expense levels dictated by any current climate, while preserving the desired risk levels.

The framework below is a value alignment index derived from Data Center 2.0 benchmarking activities. The intent is to assist CIOs and their leadership teams in identifying how their businesses can derive maximum value. When planning a firm’s Data Center 2.0 strategy, integrated planning incorporates 1) business demand prioritized by value levers (efficiency, agility, control and security) with 2) supply strategy characterized by capacity fulfillment options that may be employed (physical, virtual and intelligent).
### Data Center 2.0 Value Model

#### Capacity Fulfillment Strategies

<table>
<thead>
<tr>
<th>Value Levers</th>
<th>Physical</th>
<th>Virtual</th>
<th>Intelligent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EFFICIENCY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Footprint</td>
<td>Increase in Density</td>
<td>Increase in Density</td>
<td>Reduction in Footprint</td>
</tr>
<tr>
<td>Unit Cost</td>
<td>Reduced</td>
<td>Reduced</td>
<td>Reduced</td>
</tr>
<tr>
<td><strong>AGILITY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variability</td>
<td>Thin-Sliced</td>
<td>Thin-Sliced</td>
<td>On-Demand</td>
</tr>
<tr>
<td>Velocity</td>
<td>Weeks, Not Years</td>
<td>Weeks, Not Years</td>
<td>On-Demand</td>
</tr>
<tr>
<td><strong>CONTROL &amp; SECURITY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliance</td>
<td>Meets Standards</td>
<td>Meets Standards</td>
<td>Meets Standards</td>
</tr>
</tbody>
</table>

Figure 1 – Data Center 2.0 Value Model Index by capacity fulfillment strategy

Value levers consist of categories and sub-categories. Efficiency is composed of capacity changes in the composition of the footprint and strategies to adjust unit cost. Agility incorporates factors of variability in capacity fulfillment and ownership requirements. Additionally, the velocity at which capacity is fulfilled is a key measure of agility. Control and security incorporate value and functionality attributes of integration across the capacity value chain and the ability to ensure compliance. A multilayered approach to data center security includes robust physical, logical and custodial access control:

- **Physical Security** - Physical access controls may include perimeter surveillance, guard staff, mantraps, customer-defined access lists, badged entry and biometric screening.

- **Logical Security** - A logical security architecture may consider multi-factor authentication, identity federation and infrastructure monitoring based on a firm’s corporate rules and policies.

- **Custodial Security** - Custodial security provides full-jurisdiction, visibility and control over when and where application workloads are running – down to the rack within the data center.

A key research takeaway – A Data Center 2.0 Strategy is attractive to any enterprise IT organization because it can be deployed just-in-time. This enables firms to invest and deploy incrementally, within existing operations or in new cloud-based offerings.

In addition, the Data Center 2.0 benchmarking exercise conducted in the development of this paper found early adopter firms were able to achieve the following key value metric impact with specific benefits associated by stakeholder:
The standard metrics captured above outline typical KPIs and their definitions are well understood throughout the industry. However, the benchmarking effort of this paper found new, leading strategic metrics that require further explanation. Strategic metrics indicate the impact a Data Center 2.0 may have on a firm. Specifically, three key metrics measures were identified:

1. Percentage of IT spend in relation to revenue: Up to three times improvement;
2. Risk reduction of capacity fulfillment impact to the business was measured in terms of future potential against a current day baseline: Up to a 32% reduction in risk basis;
3. Variability and velocity of capacity fulfillment: Firms discovered that for every dollar invested in traditional/baseline approaches, there was a return on investment factor of only 1x due to traditional ownership or long-term reservation commitment. When investing with variability and velocity as priority drivers, firms found additional value of approximately 2.5x versus traditional fixed capacity investments. This was due to the ability to throttle capacity as demanded in the time frame required, resulting in capture of new revenue; the ability to test new products and markets faster; and the ability to dial capacity up or down in sync with market fluctuations, thus reducing financial risk.

The bottom line is that Data Center 2.0 can create value for any organization and accommodate any level of readiness or requirement. CIOs should take away from this value model that a Data Center 2.0 strategy can have substantial business impact. Organizations should consider conducting their own benchmark operational measures to understand how it may apply to them.
How to Implement a Data Center 2.0 Strategy

Early adopters consistently confirmed that an important differentiator of a Data Center 2.0 Value Model strategy is the ability to accommodate any type of data center capacity fulfillment need or business scenario. This was the case whether the need was to add capacity faster, exploit a cloud delivery paradigm, extend the life of an existing data center asset or build a net new data center in a faster, lower cost manner while reducing risk.

Driving maximum value outcomes requires a conscious alignment and linkage of accurate business need, balancing both quantitative and qualitative requirements, against a firm’s ability to change its capacity fulfillment strategy to one that can be leveraged employing a Data Center 2.0 strategy.

Key research takeaway - A firm’s ability to change its capacity fulfillment approach had a direct and corresponding impact on the value Data Center 2.0 provided. To assist firms in applying this knowledge, the following change management framework was developed:

![Change Management Framework](image-url)

**Figure 3 – Data Center 2.0 Value Model Change Management Framework prioritized by business driver and fulfillment strategy.**

Firms considering a Data Center 2.0 strategy cannot dismiss or overlook the need to understand, address and manage outcome expectations based on the change management ability of the firm.
IO & Data Center 2.0

As a provider of Data Center 2.0 technology, IO has employed its own software and hardware technology platform to transform its legacy colocation business to a Data Center 2.0 model. IO provides this data center capacity and management as a service, as a physical capacity deployment or as integrated cloud infrastructure to some of the largest firms in the world such as Goldman Sachs, Allianz, CBS, LexisNexis, and many others. Research found that IO is the only Data Center 2.0 technology provider that also operates data centers utilizing the technology it provides to the marketplace.

Key Research Takeaway – To understand both Data Center 2.0 Strategy and the IO technology platform, it is necessary to think in terms of a system model and the ability to address discrete business requirements by user and by workload. Data center capacity can be fulfilled as appropriate to users and workloads by the IO platform in physical, virtual and intelligently controlled means.

The Data Center 2.0 System Model powered by IO’s Intelligent Control® Platform has can accommodate varied service levels aggregated and delivered at different rates, and in different combinations and deployment models.

With this system model approach, the data center serves as the foundation upon which organizations can keep up with today’s businesses and economic climate. Data Center 2.0 is agile, affordable, integrated, scalable and manageable. It provides the capacity footprint for differentiated business execution.
Implementing IO & Data Center 2.0

An important differentiator of a Data Center 2.0 Value Model strategy is the ability to accommodate any type of data center capacity fulfillment need or business scenario. This is the case whether the need is to add capacity faster, exploit a cloud delivery paradigm, extend the life of an existing data center asset or building a net new data center in a faster, lower cost manner while reducing risk.

Leading organizations surveyed for this paper identified the following implementation approaches they were planning and executing with the IO technology platform for their specific Data Center 2.0 strategies:

• As an investment strategy to optimize existing capacity portfolio, and to derive year-over-year productivity improvements and financial savings

• As a mechanism to sweat an existing asset to help avoid a large capital expenditure

• As a capacity delivery model to support specific high value business processes that can derive sustainable advantages in the market through highest capacity performance with lowest unit cost to transact

• As a strategy to rationalize each business product line against a capacity service delivery matrix to realize best fit of execution in terms of performance, cost, capital leverage, return on asset measures, etc.

• As a strategy to re-purpose large chunks of capital investments and operating expense burdens toward innovation of new capabilities, as opposed to keeping the lights on

• As a strategy to shift capacity fulfillment toward a software-defined unit of capacity matched against specific workload requirements

• As a strategy to create a value option of variable capacity that can be dialed up or dialed down based on business scenarios

• As an enterprise cloud infrastructure incorporating open compute standards and intelligent control from click to rack while benefiting from a mixed service tier and modular capacity approach

The following table is derived from the organizational benchmarking of IO customers implementing a 2.0 strategy. It specifically captures the various capacity and fulfillment scenarios firms needed to address and the modeled benefit expected.

<table>
<thead>
<tr>
<th>SCENARIO</th>
<th>PROGRAM CAPABILITY &amp; BENEFIT</th>
</tr>
</thead>
</table>
| Need to Add Capacity            | Capability: add capacity to existing facility faster, in a smaller footprint and mixed configurations  
Benchmarked Benefit: 30% cheaper                          |
| Extend/Maximize Life of Existing Data Center Asset | Capability: deploy capacity outside facility, use less space, power, cooling to deploy new capacity in facility  
Benchmarked Benefit: 10-year extended life; a 25% improvement in ROA |
| Retrofit/Refresh Existing Data Center Asset | Capability: retrofit capacity faster, higher efficiency, less effort to complete, more flexible operating model  
Benchmarked Benefit: 75% reduction in time, 35% additional free capacity |
| Accelerate Data Center Consolidation | Capability: faster time to results; higher efficiency capacity; more flexible operating model  
Benchmarked Benefit: 80% reduction in time, 40% less capacity required |
| Implement a Mixed Service Configuration Model | Capability: mix and match resiliency, density and efficiency to best fit business requirements  
Benchmarked Benefit: 28% reduction in unit cost of IT |
| Data Center as a Service        | Capability: exploit all the capabilities identified above as a hosted capacity and cloud service alternative fulfillment model vs. on-premises owned/leased assets  
Benchmarked Benefit: five days to production capacity; avoided five years of seven-figure depreciation and cost of money |

Figure 4 – Data Center 2.0 Use Case Model and Benchmarked Benefit enabled by IO technology platform
Data Center 2.0 – Delivering Business Value: A Strategic Framework for Change

IO & Data Center 2.0 Business Case

The Data Center 2.0 benchmarking activities associated with this paper provided substantiation and applicable metrics from which a reasonable and representative business case model could be derived. The intent of the model below is to serve as an indicative tool for CIOs and their teams to start to assess the value of a Data Center 2.0 strategy when applied to their operations. The benchmark data incorporated in this business case is derived from specific IO customer deployments.

<table>
<thead>
<tr>
<th></th>
<th>HIGH</th>
<th>AVERAGE</th>
<th>LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in Overall Data Center Budget</td>
<td>68%</td>
<td>30%</td>
<td>15%</td>
</tr>
<tr>
<td>Reduction in Operating Costs</td>
<td>50%</td>
<td>25%</td>
<td>10%</td>
</tr>
<tr>
<td>Reduction in Capital Costs</td>
<td>70%</td>
<td>40%</td>
<td>20%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>HIGH</th>
<th>AVERAGE</th>
<th>LOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction in Overall Data Center Budget</td>
<td>$204M</td>
<td>$90M</td>
<td>$45M</td>
</tr>
<tr>
<td>Quarterly Cost of No Decision</td>
<td>$17M</td>
<td>$7.5M</td>
<td>$3.75M</td>
</tr>
<tr>
<td>Business Value of Enhanced QoS</td>
<td>10X</td>
<td>5X</td>
<td>3X</td>
</tr>
</tbody>
</table>

The baseline is on a $100 million annual data center budget. Two views have been provided to guide organizations when developing a business case for leveraging the IO technology platform and implementing a Data Center 2.0 strategy for their operations. The first view is a simple annual impact summary range that incorporates only financial values. The second view is the three-year impact of aggregated financial savings, along with a simple multiplier for business value quantification.

Key Research Takeaway - enterprises should assess a Data Center 2.0 strategy for their operation.

Closing Thoughts

For many organizations investing in a Data Center 2.0 strategy may offer the single most impactful initiative they can undertake. Leveraging the Data Center 2.0 Value Model to accommodate any business scenario can improve business agility, enhance quality of delivery and reduce operational risk.

It is important to understand that this is about much more than technological innovation or the latest cost savings strategy. This is a critically important, game-changing opportunity. Data Center 2.0 gives companies a chance to transform their entire businesses by starting at the very foundation of their entire IT value chain – the data center.

This strategy marks a fundamental redefinition of the data center and capacity fulfillment. What was once a cumbersome infrastructure paradigm burdened by heavy costs and time-crushing inefficiency is now a nimble, modular digital capacity factory that acts as an accelerant for business transformation. There are few other strategies with such wide-ranging positive implications, from reinventing delivery models to improving efficiency, enhancing agility, reducing risk and more.