Shift From A Cloud-First To A Cloud-Smart Approach: A Case Study In A Leading Real Estate Development Company In KSA

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Abstract— **Cloud adoption has accelerated in recent years, driven by benefits such as global accessibility, ease of deployment, scalability, faster time to market, and security. These advantages have enabled businesses to navigate rapid changes while maintaining resilience against unforeseen challenges, such as health pandemics, global supply chain disruptions, and geopolitical instability. As a result, many companies have adopted a "Cloud-First" strategy to prioritize cloud-based solutions when developing new processes or modernizing existing ones. However, the rapid expansion of cloud adoption has also introduced challenges such as cost overruns, compliance issues, and data privacy concerns. To address these challenges, the "Cloud Smart" strategy has been developed to optimize cloud adoption, helping businesses manage costs more effectively, enhance security, and deliver faster services. This paper presents a case study of a leading real estate development company in KSA, which strategically repatriated certain workloads from the cloud to on-premises environments, achieving significant cost savings. The study highlights the challenges of inefficient cloud usage, where workloads lacking cloud-native optimizations led to unexpectedly high expenses with limited operational benefits. However, The Company retained its public cloud infrastructure for modern applications, AI capabilities, and disaster recovery (DR), leveraging the cloud's agility and scalability. This paper explores the rationale, execution, and outcomes of a Cloud Smart approach using a hybrid multi-cloud model, offering valuable insights for organizations seeking to optimize their cloud environments.**

[Note: The name of the company and identifying details have been withheld for confidentiality reasons.].

Keywords— *Hybrid Multi-Cloud, Cloud Repatriation, Cost Optimization, Cloud-Smart, Cloud-First*

I. INTRODUCTION

This paper presents a case study of an undisclosed, prominent multi-asset class real estate developer based in Saudi Arabia. The organization is transforming the urban landscape through human-centric, integrated developments that aim to elevate connectivity and enhance quality of life across the Kingdom.

The entity is advancing technology-driven solutions to promote enhanced homeownership. Leveraging its advanced digital platform, the developer has streamlined the buyer journey, offering a seamless and efficient experience. In its quest to foster innovation in community development, the organization has entered into several Memorandums of Understanding (MoUs) that focus on managed detection and response, cybersecurity advisory, cloud services, and emerging technology research. These collaborations also target the development of Proptech intelligence solutions and smart mobility infrastructures, such as, electric vehicle-based delivery services.

Furthermore, the organization has been recognized with awards highlighting accelerated growth in cloud-based initiatives.

The rapid adoption of public cloud platforms has enabled the organization to innovate and scale quickly. While cloud computing offers significant benefits, including flexibility, scalability, and enhanced operational resilience, challenges have arisen as not all workloads are optimized for cloud-native architectures. This misalignment can lead to unexpected cost overruns and limited performance improvements, prompting a more nuanced evaluation of which applications benefit most from cloud migration.

II. BACKGROUND

A. Cloud-first and Cloud-smart strategy

Businesses today know that cloud strategies are key to digital transformation. To make the best decisions, it's important to understand the two main approaches: "Cloud-First" and "Cloud-Smart".

1) Cloud-First strategy: A cloud-first policy directs or requires public sector agencies to use cloud technology as the primary enabler for IT procurement and digital transformation projects [1].

2) Cloud-smart strategy: Cloud smart is an update of an initial cloud policy created in 2010 called Cloud first [2]. On the other hand, the Cloud-Smart approach is selective with cloud technology. This strategy is more critical, analyzing your existing infrastructure and making decisions that align with your business objectives [3]. A cloud-smart strategy sees the benefits of cloud but also acknowledges the value of on-premises for some workloads. It is more likely to embrace a hybrid cloud mindset and consider various factors, such as Cost, data sensitivity and compliance, before choosing a deployment model [4].

A cloud-smart approach entails determining whether an organization has the right mix of private and public cloud, edge, and on-prem infrastructure to meet its various unique workloads, as well as all its compliance and regulatory obligations. To achieve this, a cloud smart approach considers a range of factors: management, cost, visibility, interoperability, network, and application priorities of a business to create a more unified cloud environment [5].

Here are a few crucial considerations to derive maximum value from cloud investments with a holistic strategy:

- Identify and set realistic goals: The priority toward driving a smart cloud approach is to set realistic goals and expectations for cloud initiatives [5].

- The right fitment for the migration-mix: Identify the right cloud environments to determine which applications to keep on-premises and which to migrate to the cloud (private/public) [5].

- A performance measurement cycle: Identify all the benchmarks and then focus on improving them as you progress along with a cloud smart strategy [5].

- The right investment in services and orchestration tools: Invest in tools and services that help in reducing the complexity of your cloud journey [5].

- Mitigation of the risks and compliance violations: Ungoverned cloud adoption and poor foundational practices can put organizations at risk of security breaches, data loss, compliance issues and budget overruns. They must be contained and mitigated accordingly [5].

- Workplace culture realignment: Use your current resources to their maximum value including reskilling and retraining staff. Also, enhance security postures and use best practices to inherit cultural reforms [5].

- A cloud exit strategy: Create a clear cloud exit strategy during the initial cloud design and planning phases considering aspects such as stakeholder management, application, legal and data governance, etc. [5].

By taking on the benefits of all the different cloud environments and using that mix to offset the potential weaknesses of each, organizations can create a unified, automated and scalable environment perfect to their needs [5].

B. Cloud Repatriation

Cloud repatriation refers to the process of moving workloads, applications, or data from public cloud environments back to on-premises data centers, private clouds, or hybrid infrastructures. Companies often choose repatriation after realizing that public cloud solutions may not always be the best fit for their business needs in terms of cost, performance, or security [6]. According to IDC, 80% of businesses anticipate moving some computer and storage resources back from public clouds to on-premises solutions within the next year. While public cloud spending is still projected to grow— Gartner forecasts a 21.5% increase in end-user cloud spending in 2025 — this shift highlights the need for a more strategic approach to workload placement [6].

According to a recent study by Citrix, a business unit of Cloud Software Group, 42% of organizations surveyed in the United States are considering or already have moved at least half of their cloud-based workloads back to on-premises infrastructures, a phenomenon known as cloud repatriation [7].

According to Barcley's CIO Survey in April 2024, 83% of enterprise CIOs plan to repatriate at least some workloads in 2024 [8].
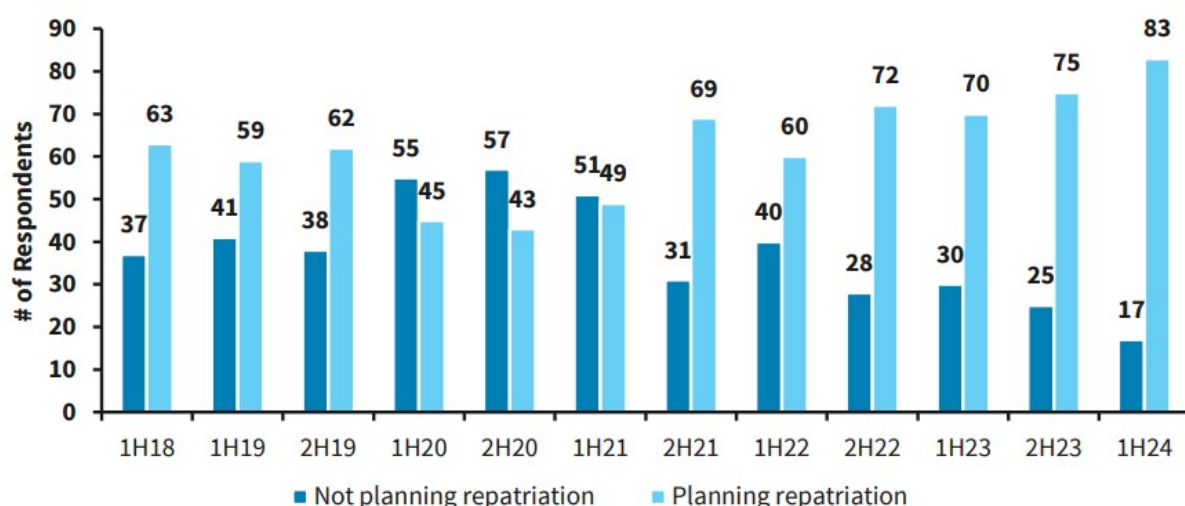
Source: Barclays CIO Survey program.

Fig. 1. Barclays CIO Survey – Percentage of Respondents Planning to Move Workloads Back on to Private Cloud / On-Premise from Public Cloud [8].

In this survey, Storage was the top workload respondents planned to repatriate (44 responses), followed by Databases (41), Firewall appliances (28), PCs/VDI (27), Compute (25), WAN Management (23), and ADCs/load balancers (20) [8].

More granularly, as shown in Figure below, Cost remained the main driver of Storage and Compute and remained the main reason for repatriating ADCs/Load Balancers [8].

Security remained the main reason for repatriating Firewall Appliances and was also the main driver of Databases. Flexibility remained a main driver for PCs/VDI [8].
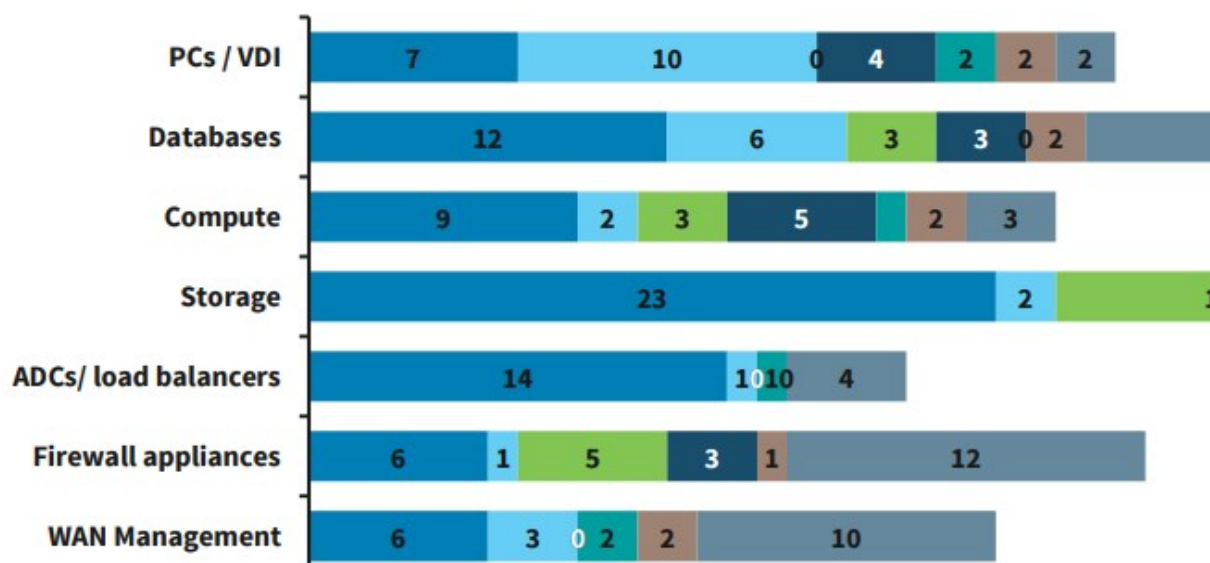
Fig. 2. Barclays CIO Survey – Percentage of Respondents Planning to Move Workloads Back on to Private Cloud / On-Premise from Public Cloud [8].

Key Examples of Companies Leaving the Cloud:

Several high-profile organizations have transitioned workloads off the cloud to reduce costs and improve operational efficiency:

- **Dropbox**: After making the decision to roll its own infrastructure and reduce its dependence on Amazon Web Services, Dropbox reduced its operating costs by $74.6 million over the next two years, the company said in its S-1 statement Friday [9].

- **37signals (Basecamp)**: For 2024, the cloud bill was reduced from the original $3.2 million/year run rate to $1.3 million. That's a saving of almost two million dollars per year for our setup! The reason it's more than the company's original estimate of $7 million over five years is that we got away with putting all the new hardware into the company's existing data center racks and power limits [10].

Best practices for a successful cloud repatriation strategy:

To ensure a seamless transition, businesses should follow these best practices when repatriating workloads:

- Assess Workload Suitability: Not every workload needs to be repatriated. Conduct an in-depth assessment to determine which workloads benefit most from on-premises or hybrid environments [6].

- Calculate Total Cost of Ownership (TCO): Compare the long-term costs of public cloud vs. repatriation, considering hardware, licensing, staffing, and maintenance [6].

- Develop a Phased Migration Plan: Gradual repatriation—starting with non-critical workload minimizes disruption and allows for adjustments along the way [6].

- Optimize Security & Compliance Measures: Ensure that security policies, access controls, and compliance frameworks are in place before repatriation to avoid vulnerabilities [6].

- Consider Hybrid & Multi-Cloud Options: Instead of moving everything back on-prem, evaluate hybrid models that balance public and private cloud resources for flexibility and efficiency [6].

C. *Definition of Hybrid Multi-Cloud*

Hybrid cloud is the use of both public cloud and private cloud environments, with management, orchestration and portability between them that enables an organization to use them as a single, unified, optimized IT infrastructure [11].

Multi-cloud is the use of cloud services from more than one cloud vendor. It gives organizations the flexibility to optimize performance, control cost and avoid vendor lock-in [11].

III. RESEARCH METHODOLOGY

This case study follows qualitative research methodology, incorporating direct observations and internal reports to analyze the company's hybrid multi-cloud strategy. The methodology involved the following steps:

- **Data Collection:** Information was gathered from the real estate development company's IT team, financial reports, and cloud performance metrics to assess the impact of workload repatriation.

- **Workload Analysis:** A detailed evaluation of cloud-hosted workloads was conducted to determine their cost efficiency, performance, and alignment with business objectives.

- **Cost-Benefit Assessment:** The financial impact of cloud repatriation was analyzed by comparing pre- and post-migration cost structures.

- **Implementation Review:** The migration process was monitored to document challenges, best practices, and lessons learned.

- **Performance Metrics:** Key performance indicators (KPIs) such as cost reduction, workload efficiency, and system reliability were tracked to measure the success of the strategy.

IV. CLOUD JOURNEY AND STRATEGY EVOLUTION – CASE STUDY

A. *Initial Cloud Adoption*

The real estate development company initially hosts its infrastructure in a shared colocation facility before transitioning to a cloud-first strategy to accelerate its digital transformation. The primary goal was to enhance scalability and agility. As part of this approach, the company prioritizes cloud adoption for new IT projects and initiatives, making it the default option to avoid the complexities of procuring and maintaining hardware and infrastructure in a data center. The company chose Oracle Cloud Infrastructure (OCI) as a public cloud hosted in Saudi Arabia (KSA) to meet compliance requirements while leveraging scalability, agility, and global reach. However, despite the clear benefits of cloud computing, the company's First Cloud adoption did not fully account for the diverse requirements of all workloads, a challenge that became evident over time.

B. *Challenges of Cloud-First Strategy*

While the cloud offers significant advantages, the company faced the following challenges:

1) *Unexpected High Costs:* .

a) Traditional infrastructure patterns (IaaS): Highlight all author and affiliation Running workloads in the cloud using traditional infrastructure patterns, like virtual machines (VMs) for business applications, ended up costing more than expected. These applications continued processing and storing data the same way they did on-premises, missing out on cloud-native efficiencies and driving up expenses.

b) Hidden Costs & Data Transfer Fees: Cloud providers impose additional charges for data transfer and data retrieval, leading to unforeseen expenses.

c) Licensing Costs: Software licensing in the cloud, particularly for platforms like Windows and SQL databases, often proved more expensive than anticipated.

2) Limited Operational Benefits: To change the Workloads like virtual machines (VMs) that did not leverage cloud-native features such as containers, serverless computing, or auto-scaling saw minimal improvements in performance, scalability, or management efficiency.

These challenges highlighted the need for a more tailored and cost-conscious approach to cloud adoption.

C. Transition to a Cloud-Smart Adoption Strategy

In response to these challenges, the company reassessed its entire IT infrastructure and conducted a comprehensive evaluation of its cloud-hosted workloads. This review focused on achieving cost efficiency, improving performance, and ensuring alignment with overall business objectives. The result was the adoption of a Cloud-Smart Strategy.

The Cloud-Smart Strategy represents a more strategic use of cloud services, where cloud infrastructure is seen as a tool rather than a default solution. By carefully balancing cloud and on-premises resources, the company can ensure both cost savings and operational excellence.

Under the Cloud-Smart approach, the company selectively repatriated workloads back to on-premises environments, while retaining its Multi public cloud infrastructure GCP, Azure and OCI for modern applications, artificial intelligence (AI) capabilities, and disaster recovery (DR) needs.

1) Repatriation of some Infrastructure-as-a-Service (IaaS) workloads back to on-premises: A detailed cost analysis indicated potential savings by shifting specific IaaS workloads back to on-premises environments. These VMs did not leverage cloud-native features, resulting in minimal improvements in performance, scalability, or management efficiency. Additionally, infrastructure costs for these workloads were the highest and unsustainable.

a) Cost Measurment:

The company measured the cost benefits of repatriating workloads to on-premises by using the following formula:

Repatriation Cost=OnPrem CAPEX + (OnPrem OPEX * M) + (PC OPEX * C) + Migration Costs

Where:

- OnPrem CAPEX = On-Premises Capital Expenditure (Data Center Space, DC Infrastructure, HW Infra, Network setup, Licenses).

- OnPrem OPEX = On-Premises Operational Expenditure (monthly) (DC Maintenance, Operations team, Recurring Licenses Renewals, application support, Miscellaneous Recurring Expenses)

- M = Number of months the workloads will run on-premises after repatriation

- PC OPEX = Public Cloud Operational Expenditure (monthly) (Cloud Services Utilization cost, Applications Support).

- C = Number of months workloads run in parallel in the public cloud during repatriation.

- Migration Costs = One-time costs for migration (data transfer, consulting, application modifications).

b) Repatriation Processes: To achieve cost efficiency, enhance performance, and align with overall business objectives, the company implemented a structured repatriation process.

- Assessment and Planning phase: The company assessed the workloads running in the cloud to determine which should be moved back on-premises. They considered factors like cost, performance, compliance, and data sovereignty. A detailed migration plan was created, outlining the necessary steps, timeline, and resources. Additionally, the company ensured that on-premises support infrastructure—such as storage, databases, logging, monitoring, and backup solutions—was in place before making decisions about application repatriation.

- Communication and Change Management: Effectively communicate the migration plan to stakeholders, ensuring alignment and engagement. Gaining stakeholder support is essential for the project's success.

- Application Dependencies: The company used third-party tool to understand the dependencies between applications and services. Some workloads may rely on other cloud services.

- Application Migration: Begin by exporting data from the cloud environment, starting with backup creation. The company utilized a secure VPN to transfer data back to on-premises servers while ensuring no disruption to workload users and administrators. It is crucial to grant access only to authorized users and properly configure permissions for on-premises resources.

- Network Configuration: network settings were adjusted to route traffic from the cloud to on-premises. This included updating DNS records, configuring firewalls, and modifying load balancers as necessary.

- Testing and Validation: The company first migrated test and development environments before establishing a pre-production environment to validate the repatriation process. Workloads were rigorously tested to ensure functionality, address compatibility issues, and resolve performance bottlenecks in the on-premises environment.

- Log Management Tool: The company's existing log management tool was integrated with workloads to aggregate and analyze logs efficiently.

- Monitoring: On-premises monitoring solution was already in place and seamlessly integrated with workloads to collect and analyze performance metrics.

This strategic move ensured that the company could meet its performance needs while optimizing costs, maintaining security, and improving the user experience.

D. *Retaining the Cloud for Innovation and Resilience*

Despite repatriating some workloads, the company continued to leverage the public cloud for specific use cases that aligned with the company's core needs:

- AI Capabilities: The company utilized cloud-native services such as machine learning platforms and GPU instances to build and deploy AI models.

- Modern Applications: The company retained cloud infrastructure to host modern applications built with serverless computing, containers, and microservices.

- Disaster Recovery (DR): The company used a multi-cloud DR strategy to ensure business continuity and resilience, taking advantage of the cloud's scalability to handle potential disaster scenarios.

By keeping the cloud for these key innovations, the company was able to combine operational agility with long-term scalability, ensuring a competitive edge in the market.

E. *Results and Benefits*

The repatriation initiative and adoption of a cloud-smart strategy led to significant improvements for the company:

- **Cost Reduction:** The company achieved a 57.71% reduction in cloud-related expenses for the targeted workload over one year, contributing to better financial management.

- **Operational Flexibility:** Repatriating VMs to on-premises infrastructure enhances operational flexibility by providing full control over management tasks such as cloning and snapshots, enabling faster and seamless troubleshooting, without the limitations or dependencies imposed by cloud providers.

By adopting a Cloud-Smart approach, the company enhanced its ability to harness evolving technologies while reducing costs and achieving long-term value from its cloud investments.

F. *Lessons Learned*

The company's experience offers valuable insights for other organizations looking to adopt hybrid multi-cloud strategies:

- Workload Assessment is Critical: Not all workloads are suited for the cloud. Thoroughly assessing each workload's requirements and business value is essential for making informed decisions.

- Legacy System Modernization: Many large enterprises operate legacy systems that cannot be entirely replaced overnight. A hybrid cloud approach allows for a phased migration, ensuring business continuity while modernizing over time.

- Optimization is Key: Unoptimized cloud environments can lead to significant cost overruns. Continuous optimization should be a priority for every cloud strategy.

- Hybrid multi-cloud is a Strategic Imperative: A balanced approach that leverages both on-premises and cloud resources can deliver substantial cost efficiency, innovation, and resilience.

- Centralized Management is Essential: Investing in unified management tools and platforms is crucial for effectively managing applications across hybrid environments.

- Security and Compliance Must Be Unified: Security policies and compliance standards should be consistent across all environments, ensuring data protection and regulatory compliance.

V. Conclusion

The Company's hybrid multi-cloud strategy demonstrates the power of strategic workload placement and ongoing optimization in achieving cost efficiency and operational excellence. By repatriating specific workloads to on-premises IaaS environments while retaining the cloud for AI, modern applications, and disaster recovery, The Company realized significant cost savings without sacrificing innovation or scalability. This case study serves as a valuable blueprint for organizations navigating the complexities of hybrid multi-cloud environments.

The company shift from a cloud-first to a cloud-smart approach underscores the need to align cloud strategies with broader business goals. As cloud computing continues to be integral to digital transformation, a hybrid multi-cloud approach enables organizations to optimize costs, enhance performance, and meet regulatory obligations. Future research could further explore automation and AI-driven orchestration to enhance hybrid cloud efficiency.

The transition from cloud-first to cloud-smart represents a more mature and adaptive strategy for IT. In the coming years, businesses will prioritize cloud-smart strategies—combining the cloud's scalability with the performance and control of on-premises solutions. This approach ensures a sustainable and future-proof IT ecosystem in an evolving digital landscape.

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