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Abstract—This research paper aims to investigate the transition from a rich client to a web client in Product Lifecycle Management (PLM) applications, analyzing the benefits and challenges associated with this migration. The study compares the two user-interface based on several key factors, including user experience, performance, scalability, security, and development effort. This research provides insights into the transitioning, which will facilitate informed decision making for organizations aiming to modernize their PLM systems.

Keywords—Product Lifecycle Management (PLM), Rich Client, Web Client, Migration

I. INTRODUCTION

In the past decade, there has been a significant shift in software development towards web based applications due to their inherent advantages such as platform independence, accessibility, and ease of deployment. This trend has also influenced the Product Lifecycle Management (PLM) domain, which traditionally relied on rich client applications for managing complex product and processes. Over the widespread benefits, there are challenges such as data security, performance optimization, and potential limitations of web technologies must be carefully addressed during the migration process. However, the organizations expanding in PLM domain can make use of the cost and deployment benefits of thin client architecture

II. ANALYSIS

Our analysis reveals several key gains associated with transitioning from a PLM rich client to a web client:

A. Enhanced Accessibility

Web clients offer improved accessibility as they can be accessed from any device with a web browser and internet connectivity. This allows users to conveniently access PLM functionalities and data from multiple locations, facilitating remote collaboration and flexibility.

B. Cross-Platform Compatibility

Web clients are platform-independent, enabling users to access PLM systems regardless of their operating system or device. This compatibility eliminates platform specific limitations, expands the user base, and promotes seamless collaboration among diverse teams.

C. Platform Maintenance

Web clients eliminate the need for individual client installations and updates. By centralizing updates and relying on web-based deployment, organizations can reduce IT overhead and ensure that all users have access to the latest version of the PLM system.

D. Centralized Data

Web-based PLM application allows data governance from a centralized location accessible to authorized users. It enables improved data consistency, control, and integrity. Recovery of centralized data are very much convenient and data loss from rich clients can be avoided.

E. Scalability

Web-based PLM applications can be easily scaled to accommodate growing user bases or increased data volumes. Leveraging cloud infrastructure or distributed architectures, organizations can dynamically adjust resources to meet changing demands, thereby ensuring optimal performance and user experience.

F. Cost Savings

The adoption of web clients can potentially lead to cost savings. Reduced installation and maintenance efforts, centralized updates, and the ability to leverage cloud resources can result in lower operational costs compared to maintaining and supporting rich client applications.

G. Improved Collaboration

Web clients offer seamless collaboration capabilities, enabling real-time access and concurrent work on PLM data. Collaboration features such as concurrent editing, commenting, and version control promote efficient teamwork and decision-making among distributed teams.

H. Integration Possibilities

Web-based PLM systems can easily integrate with other web services, applications, and APIs. This opens opportunities for integrating PLM with other enterprise systems, such as ERP (Enterprise Resource Planning) or CRM (Customer Relationship Management), enabling better data flow and process synchronization.

While these gains are significant, organizations must address several challenges during the transition

III. CHALLENGES

A. Data Security

Web-based PLM systems require robust security measures to protect sensitive product data. Encryption, authentication mechanisms, and secure data transmission protocols are crucial to maintain data integrity and confidentiality. It is essential to adopt a proactive and comprehensive approach on data security to safeguard the integrity, confidentiality, and availability of PLM data.

B. Performance Optimization

Web clients may face performance challenges due to factors such as network latency and browser compatibility. Techniques such as caching, asynchronous data loading, and responsive design should be employed to optimize performance and ensure a smooth user experience.

C. User Interfaces

Web clients must provide responsive interfaces that adapt to various screen sizes and resolutions. Implementing responsive design principles and mobile-friendly layouts is essential to ensure usability across different devices.

IV. RESULTS AND DISCUSSION

An example total cost of ownership analysis is presented in Table 1 with respect to purchase costs, software license costs, network support costs, desktop support costs, upgrade costs, security costs, power consumption, heat generation and office real estate.[1]

Table 1: Comparison of PC and Thin Client in terms of Total Cost of Ownership.[1]

Criteria	PC	Thin Client	Saving (\$)
Purchase Cost	650	350	300
Hardware Upgrade (CPU, Memory, Disk etc.)	320	-	320
Software Upgrade (OS, User Programs, etc.)	250	-	250
Virus Protection	30	-	30
Upgrade Labor Cost	250	-	250
Technical Staff Cost. (Per 100 users)	3 staff = 180.000 (annual) 1800 (per user)	1 staff = 60.000 (annual) 600 (per user)	1200
Data Backup and Storage Maintenance	200	-	200
Power Consumption (watt/h)	350	20	450
Total savings per client after 5 years: 3000 \$			

From Figure 1 it can be observed that per user power consumption by the server is lower if the number of users on the server is higher. It is not optimum to operate the server with a smaller workload value because the server utilizes a minimum amount of power irrespective of the amount of load on it. Therefore, it is always power efficient to operate the server at maximum load on the servers.[2]

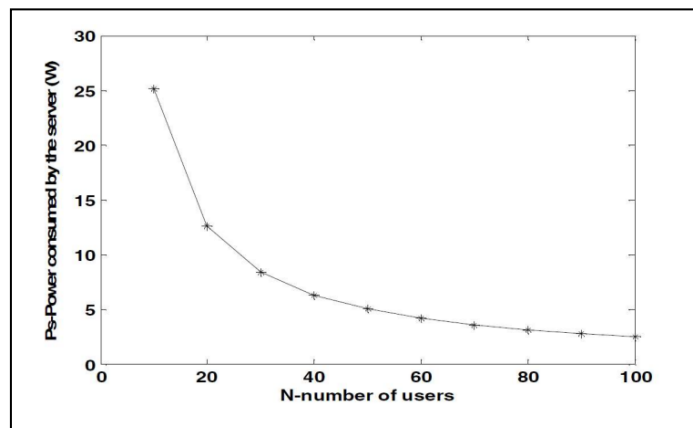


Fig. 1. Total power of the server Vs. Number of users.[2]

V. CONCLUSION

Transitioning from a PLM rich client to a web client offers numerous advantages in terms of accessibility, compatibility, cost savings, scalability, and collaboration. However, organizations should address challenges related to data security, performance optimization, and responsive user interfaces. By considering these factors, organizations can successfully migrate to web-based PLM systems and unlock the benefits offered by modern web technologies.

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