ANALYSIS OF TRENDS IN PERFORMANCE DRIVEN WEB APPLICATIONS

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Abstract **- Performance driven web applications are generally Internet facing web applications which cater to B2C scenarios such as e-commerce web sites, online retail sites, information performance driven web sites and such. Many of the intranet web applications such as employee dashboards, sales and marketing web applications also need high performance for its ultimate success. In this paper we will focus mainly on the trends notices in the intranet and external performance focused web applications.**

In this paper we have tried to address this crucial issue by discussing various aspects of personalized performance optimization algorithms.

Index Terms – trends, Intranet web applications, Internet web applications, performance driven sites

I. INTRODUCTION

This paper focuses on identifying the emerging trends in intranet and extranet performance driven web sites. After analysis of various requirements for intranet/extranet performance driven web sites we can notice few common patterns and recurring themes. For instance, engaging internal stakeholders are natural requirements for intranet performance driven web site, whereas, information aggregation and enterprise application integration are salient features for an extranet performance driven web site.

A. Brief Overview of performance driven web sites

An Enterprise performance driven web site is a framework to deliver personalized user experience by aggregating information from variety of data sources. Following are primary use cases, which warrant a performance driven web site, as compared to a normal web application:

- Aggregation of information from multiple data sources
- Provide personalized user experience
- Provide a single-stop-shop for all enterprise needs ranging from information to functionality required to fulfill business processes
- Provide role based and fine-grained security controls with other security features like single-sign-on and ability to integrate with variety of security providers.
- Provide consistent and intuitive user experience providing ability for end users to customize the said experience

From our execution experience in Manufacturing industry, easy information access, enterprise integration and personalized user experience are more relevant performance driven web site use cases.

B. Literature review

Performance driven web sites are the key influencers on the overall user satisfaction. The key techniques of developing the performance driven web sites is described in [5] [6] [10] through generic best practices and thumb rules. Resources such as [7] [8] [9] also provide thumb rules and performance best practices to develop a performance driven web site.

II. USE CASES IN INTRANET PERFORMANCE DRIVEN WEB SITE

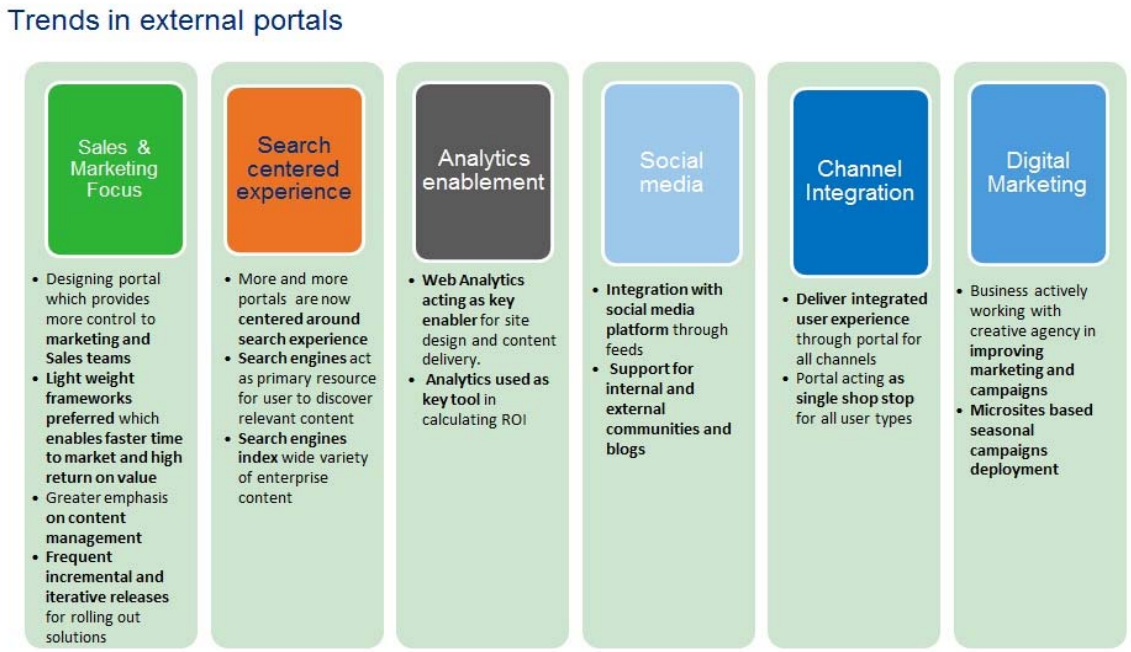
The main target audience for intranet performance driven web sites would be internal users like employees who use intranet performance driven web site as a communication channel and use internal tools/applications. Some of primary use cases noticed in intranet performance driven web site are depicted below:

- **Services based integrations:** In order to provide a single-stop-shop experience to internal users, intranet performance driven web sites need to integrate with all the in-house systems. This includes ERP systems for HR and finance applications, reporting applications, integration with database and CMS systems.
- **Security:** As the intranet performance driven web site often interacts with discrete systems, security assumes greater importance. Security aspects involve providing single-sign-on experience, role based functionality access, deploying security gateways etc.
- **Collaboration:** Acting as a collaboration platform is one of the key functionalities for intranet performance driven web sites. This includes:
    - Engage the user community through collaboration tools like blogs, chats, communities and wiki.
    - Provide a knowledge base for internal community.
    - Allow a single platform for users to learn, share and interact.
- **Process improvements:** Internal policies and tools often involve multi-step process and manual involvement. Off-lately we have noticed trends in this space including:
    - Minimizing process steps and reducing the overall transaction time
    - Focus on self-service model
    - Focus on automating process steps
    - Providing intuitive user interface
    - Enabling search based information access
    - Well defined information architecture
    - Intuitive navigation structure

III. TRENDS IN EXTRANET PERFORMANCE DRIVEN WEB SITE

Extranet or external performance driven web sites cater to the entire online world including customers, web users, partners, vendors, suppliers for the organization. The scope and complexity of external performance driven web sites is naturally high as they need to be accessible across various geographies and in different languages with strict SLAs.

Some of trends noticed are depicted below:



- **Sales and Marketing Focus:** Most often the extranet performance driven web sites are sales and marketing focused to achieve following high level goals:
    - Performance driven web site platform should ease business operations (mainly related to sales/marketing)
    - Performance driven web site Platform should enable users with greater control for content authoring and publishing operations
    - Performance driven web site Platform should support business users should be able to manage campaigns and micro-sites effectively
    - A light-weight platform is preferred to reduce the time-to-market and realize return-on-investment (ROI) in quick time.
    - Easy integration with CMS, enterprise search systems and other enterprise systems preferred.
    - Enable the user with relevant information discovery with ease and convey consistent user experience.
- **Search centered experience:** Search is assuming greater importance in customer facing performance driven web sites. Some of them have even positioned search as a primary and preferred form of navigation and as a key entry point. Search centered experience mainly involves:
    - Search enabling key functionalities
    - Easy access to search from all pages
    - Optimized search experience like provide search results in quick time, providing context based and personalized search results, improving relevancy of search results
    - Exposing search functionality as a service
    - Search content within all enterprises systems including web, database, CMS etc.
    - Dynamic page aggregation based on pre-configured search terms.
- **Analytics enablement:** Web analytics is playing a key role in providing deep customer insights and optimize the user experienced based on it. Following are key steps involved:
    - **Acquire** the key analytics information including site usability data (page views, downloads, click map, click paths etc.), understand the visitor profile (user segments, geos, languages etc.) and the conversion statistics (new visitors, returning visitors, leads exit rate, visit duration etc.)
    - **Analyze** the information obtained to understand the site usability (information discoverability, site interactivity, information architecture effectiveness), conversion statistics (visitor stickiness, exit rates etc.) and sources (campaign effectiveness, SEO effectiveness, external ad effectiveness)

- **Act** on the information by making necessary improvements to site design, information discoverability, and navigation changes and provide targeted content and effective campaigns.

- **Social Media:** This is acting as a key driver to engage and collaborate customers and partners. Most of the clients are planning to integrate with external social media platforms and provide features like feeds, blog, user communities. Involving and engaging customers translate into key business benefits including increased customer loyalty, promoting brands and creating brand awareness.
- **Channel Integration:** As mobile devices and tablets are increasingly becoming popular for web access, the web site should support access over all these channels. Mobile enabling the sites and providing native mobile apps as required is gaining momentum. In addition the information should be consistent and integrated across all the channels.
- **Digital Marketing: This involves social media based marketing, micro-sites for seasonal campaigns and continued engagement with digital customers.**

IV. OTHER CONSIDERATIONS

Also external performance driven web sites need to take other factors into consideration. Some of them are listed below:

- **Performance:** This forms a critical aspect of any external performance driven web site which involves performance optimization at multiple levels:
  - ***Optimized functionalities***: The key site functionalities like search, shopping cart need to be optimized to deliver good user experience.
  - ***Client side aggregation:*** Maximize the client side functionalities leveraging AJAX based partial page rendering to improve page load times
  - ***Web performance optimization***: Adopt performance best practices like merging & minifying JS/CSS files using CSS Sprites etc. to improve page load times.
  - ***Content delivery networks:*** Geographically distributed sites can leverage popular CDN networks like Akamai to provide to maintain strict SLAs
- **Localization:** The performance driven web site should support localization to enhance customer reach. A more intuitive way is to automatically redirect the user to localized site based on user's browser locale or previously stored user's localization preference.
- **Real time monitoring:** Use monitoring tools like Gomez, IBM Tivoli to actively monitor the applications in real time and effectively respond to production outages. These tools also help in analyzing performance bottlenecks and other performance issues.
- **Personalization:** This is one of the primary performance driven web site use cases which involves:
  - Explicit personalization involving relevant content/information based on user's preference.
  - Implicit personalization which customizes user experience based on user's past behavior, buying patterns, geography and locale.
- **Search engine optimization:** Provide relevant information of the page so that relevant pages are properly indexed by search engines to ensures that site gets relevant internet traffic.
- **Disaster recovery environment:** Involves maintenance of a mirror site in case of unforeseen natural disasters. Mirror site and data center will be in a different geographic location than the original production servers.
- **Intuitive User experience and information architecture**: External performance driven web site should enable the user with relevant information discovery with ease and convey consistent user experience. The user interface should be responsive (minimal time for completing the requested operation) and interactive (rich UI features like drag and drop etc.)

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