Redesigning and Implementing the New User Interface for the HGBaquiran College Website

Final Requirements Submitted to Mr. Kim S. Tarayao, Faculty Member of the Information Technology Department, HGBaquiran College, Inc. – Tumauini, Isabela.

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Part I: Research Topic

First impressions matter - especially nowadays. Since a college website serves as a primary gateway for students, faculty, and visitors to access essential information. A poorly designed interface can create frustration, reduce engagement, and even deter potential enrollees.

While HGBaquiran College already has an existing website, we identified a critical issue: a lack of mobile responsiveness. Nowadays, based on our observations and data gathered through Data Analysis and Web Scraping + APIs, where most users browse the web on smartphones and tablets, a non-optimized interface leads to poor navigation, slow loading times, and an overall unsatisfactory user experience. By redesigning and modernizing the UI, we aim to:

- Enhance accessibility - Ensure seamless browsing across all devices (desktop, tablet, mobile, and even IoT devices like Television and Refrigerators *(!--as long as they have a screen-->).*
- Improve usability - Simplify navigation and make key information easier to find.
- Boost engagement - Create a visually appealing, intuitive, and professional interface that reflects the institution's credibility.
- Future-proof the system - Implement scalable design principles for easy update and maintenance. The spiral model will be used.

This project isn't just about aesthetics about functionality, inclusivity and user satisfaction. A well-designed website can significantly impact enrollment rates, student retention, and the college's overall digital presence.

Part II. Data Collection Methods

To ensure an effective redesign of the HGBaquiran College website, we employed a multi-method approach to gather both qualitative and quantitative insights. Our data collection process included:

1. User Observation & Feedback
    - We observed how students, faculty, and visitors interfaced with the current website, noting pain points such a confusing navigation, slow load time, and mobile responsiveness issues.

The reason why we use this method is direct observation. It helps us as developers to identify real-world usability problems that users may not explicitly report, ensuring our redesign addresses actual frustrations.

2. Google Analytics and Bing Webmaster Data Analysis
   - We analyzed key metrics such as bounce rates, session duration, device breakdown, and traffic sources to understand user behavior.

The reason why we choose this method, analytics provides objective, data-driven insights on how users engage with the site, helping us as developers to prioritize improvements based on actual usage patterns rather than assumptions.

3. Web Scraping & API integration
   - We extracted structure data from the existing website (e.g, page hierarchies, broken links, and outdated content) using automated scraping tools developed and exclusively used for FUSASIS.
   - APIs were used to gather dynamic data (e.g, grading system and course listings) for seamless integration into the new system.

The reason why we use this method: Web scraping helps systematically audit content and functionality, while API's ensure real time data accuracy in the redesigned interface.

At the end of the BETA program development, combining user experience (UX) research, analytics, and technical data extraction, we ensured our redesign was evidence-based, user-centric, and technically sound.

Part III: Ensuring Data Quality and Integrity

To maintain accuracy and reliability in our data collection process for the HGBaquiran College website redesign, we implemented the following strategies:

1. Automated Data Validation & Error Handling
   - Implementation:
     - Applied real-time error detection in web scraping (e.g., handling missing elements, retry mechanics for failed requests).
     - Used script-based checks (e.g., regex for form inputs, API response validation) to filter out incomplete or inconsistent data.
- Why this matters: To prevent corrupted or duplicate entries in datasets and ensure that analytics and user feedback are based on clean, structured data before analysis.

2. Cross-Verification with Multiple Data Sources
    ● Implementation:
        - Compared to Google Analytics metrics (e.g., bounce rates), Bing Webmasters crawl reports to identify discrepancies.
        - Supplemented scraped data with manual audits of critical pages (e.g., admissions, faculty directories).
● Why this matters: It reduces bias from single-source discrepancies and confirms findings (e.g., high exit rates on mobile) are consistent across tools, strengthening decision making.

A trustworthy dataset free from gaps or distortion, enabling informed, unbiased UI/UX improvements.

Part IV: Address Ethical and Legal Considerations

To ensure compliance with ethical standards and legal regulations during the HGBaquiran College website redesign, we adhered to the following protocols:

1. User Data Anonymization
    ● Action: All personally identifiable information (PII) collected via feedback forms or analytics (e.g., IP addresses, cookies, user IDs) was anonymized or aggregated to prevent individual identification.

Why we implement this: To protect user privacy under laws like the Philippine Data Privacy Act of 2012 (RA10173) and ensure compliance with GDPR principles for international visitors.

2. Informed Consent for Feedback
    ● Action: Explicit consent was obtained from users (students, faculty, visitors) before collecting feedback or session recordings, with clear disclosures about the data usage.

Why we implement: Respect autonomy and align with ethical research standards, preventing unauthorized data collection.

3. Adherence to Copyright and Intellectual Property Laws
    ● Action: All third-party assets (e.g., fonts, images, and APIs) were licensed or sourced from royalty-free platforms (e.g., Unsplash,

Font Awesome, and Google Fonts), and proprietary college content was used with permission.

Why we implement: To mitigate legal risk of copyright infringement and ensure the redesign respects existing digital property rights. We also prioritize transparency, accountability, and legal compliance throughout the project lifecycle.

Step V: Plan Data Storage and Security

To ensure the confidentiality, integrity, and availability of all collected data, we implemented the following storage and security measures:

1. Secure Cloud Storage with Encryption
   - Implementation: All data (analytics, scraped content, user feedback) is stored in password-protected, encrypted cloud storage (Google Cloud Platform and Microsoft Azure with AES-256 encryption).
   - Sensitive data (e.g., user session logs) undergoes end-to-end encryption (TLS 1.3) during transfer and at rest.

Why we implement: To prevent unauthorized access and comply with data protection laws (RA10173).

2. Role-Based Access Control (RBAC)
   - Implementation: Only authorized team members (developers, project leads) have access to raw data, with permission tiered by necessity (e.g., read-only for analysts).

Why we implement: Minimizes internal breaches and ensures accountability.

3. Automated Backups and Disaster Recovery
   - Implementation: Daily automated backups to geographically distributed servers (Github Server + local external hard drive).
   - A disaster recovery plan is in place, including versioned backups and 7 day retention policies under FUSASIS code of conduct.

Why we implement: Guarantees data resilience against hardware failures, cyberattacks (e.g., ransomware), team espionage, or accidental deletion.

4. Regular Security Audits
   - Implementation: Quarterly vulnerability scans (using tools like Nessus) and penetration testing to identify weaknesses.

- Logs of all access attempts are monitored for anomalies.

Why we implement: Proactively address emerging threats and maintain compliance. A secure, auditable, and redundant data management system that safeguards user trust and institutional integrity.

Part VI: Brief Data Analysis Plan