eChannelling Website Quality Analysis Report

Assignment 3

1. Main Objectives of the eChannelling Website

- **Convenient Online Doctor Appointment Booking:** The primary goal of eChannelling is to provide patients with a **simple and time-saving way to book medical appointments online**. Users can search for doctors and schedule consultations without having to visit hospitals or stand in physical queues

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. This convenience makes healthcare access easier and more **cost-effective** for the public.

- **Extensive Healthcare Network Access:** eChannelling connects patients to a **large network of doctors and hospitals across Sri Lanka**. In fact, it is known as *"the largest Doctor Channeling Network in Sri Lanka"*

sitelike.org

, partnering with over 150 health institutions (including private and Ayurvedic hospitals)

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. This broad network means patients have a one-stop platform to find specialists from many hospitals nationwide.

- **Telemedicine and Remote Consultation Services:** Another key objective is to enable **telehealth services**. The platform supports audio and video consultations (tele-channelling), allowing patients to consult doctors remotely via online video calls

bizenglish.adaderana.lk

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. This became especially important during the pandemic and continues to help those who prefer remote consultations or are abroad, by **providing healthcare access anytime, anywhere**.

- **Automated Scheduling and Efficiency:** eChannelling aims to **streamline healthcare scheduling** for both patients and providers. By automating appointment bookings and patient management, the system reduces administrative burdens and wait times. According to its description, it provides "a simple and efficient way for patients and healthcare providers to connect" through automation

worldweblist.com

. This objective improves overall efficiency in the healthcare delivery process.

- **Comprehensive E-Health Services Platform:** Beyond doctor appointments, eChannelling's objective is to be a **holistic digital healthcare platform**. It has expanded services to include online pharmaceutical orders, lab test bookings, health check-up packages, and even ambulance requests via its ecosystem (especially through its app)

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. By offering these additional services, the website seeks to **cover various patient needs** (consultation, medication, diagnostics) in one place, enhancing the healthcare experience for users.

2. Key Stakeholders of the eChannelling Website

- **Patients (General Public Users):** *Patients* who need medical consultations are the primary stakeholders. They use the eChannelling website (or app) to find doctors, book appointments, and access related services. Their stake is getting convenient and timely access to healthcare. The platform is designed for their benefit – *allowing patients to easily book doctor appointments online*

, choose preferred hospitals or specialists, and even receive remote care. Patients expect the system to be easy to use, reliable, and secure for handling their personal health information and payment details. A positive experience for patients (easy navigation, confirmation of bookings, reminders, etc.) is critical, as their satisfaction will determine the platform's success.

- **Doctors and Healthcare Providers:** *Doctors, clinics, and hospitals* that partner with eChannelling are another major stakeholder. These healthcare providers rely on the platform to manage their appointment schedules and reach patients. eChannelling gives them a digital channel to list their available time slots and attract patients beyond walk-ins. For instance, eChannelling provides access to numerous private and Ayurvedic hospitals across the country

. Providers expect the system to handle bookings smoothly (so their schedules are correctly updated), send notifications of appointments, and perhaps manage patient queues. Their stake is that the platform helps reduce no-shows and administrative work by handling bookings and payments. In essence, doctors and hospitals use eChannelling as a service to fill appointments and facilitate patient flow, so the site must be reliable and integrate with their operations. *(Note: The eChannelling company/administrators themselves are also stakeholders – they maintain the system and have business goals – but the patients and medical service providers are the two most direct stakeholder groups.)*

3. How Software Testing Supports Successful Implementation

1. **Ensuring Functional Correctness and Meeting Requirements:** Software testing verifies that all features of the eChannelling site work as intended and meet the specified requirements. For example, testing confirms that searching for a doctor, booking an appointment, processing a payment, or cancelling a booking each behaves correctly. By catching functional bugs or mismatches with requirements early, testing ensures the deployed system actually delivers the core functionality users need. This alignment with requirements is essential for a successful implementation – if the system functions are accurate and reliable from day one, users can accomplish their goals (booking appointments, etc.) without frustration.

2. **Improving Reliability and Stability:** Rigorous testing (including various input cases and load conditions) helps ensure the website operates **reliably** over time. Reliability means users can depend on the site to work consistently without crashes or errors. For a healthcare service, this is critical – patients and doctors must trust that the system will be up and functioning when needed. Through system testing and bug fixing, software testing makes the platform stable enough to handle real-world use. In industries like healthcare, thorough testing is essential because software failures can erode user trust

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. A well-tested, reliable site supports successful implementation by providing a smooth, uninterrupted experience to its users.

3. **Enhancing Security and Data Protection:** Testing plays a key role in identifying and fixing security vulnerabilities before the system goes live. Given that eChannelling handles sensitive personal data (patient details, medical information, payment data), **security testing** is vital. It ensures that data is properly encrypted, that only authorized users can access certain information, and that the system is resistant to threats like SQL injection or leaks. By performing penetration tests and validating access controls, testing can catch weaknesses such as the one that previously allowed unauthorized access to patient info. This prevents data breaches and protects user privacy

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, which in turn maintains user trust. A secure system is a cornerstone of successful implementation, especially for an online healthcare platform where users must feel safe entering their data.

4. **Assuring Performance and Scalability:** Software testing (specifically performance and load testing) helps verify that the website can handle the expected number of users and transactions with acceptable speed. This is crucial for eChannelling, which may experience peak usage when many patients log in to book popular doctors or during health scares. By simulating heavy user load, testers can identify performance bottlenecks (like slow page loads or database lag) and the development team can optimize these before launch. Ensuring the site is responsive and **scales** well under load means that during actual high-demand periods the system will remain usable. Good performance contributes to user satisfaction – if pages load quickly and bookings go through without delay, users are more likely to adopt and continue using the service, making the implementation a success rather than a struggle.

5. **Improving User Experience (UX) and Usability:** Testing isn't only about code – it also evaluates the **user interface and experience**. Usability testing involves having real users or testers interact with the website to find areas of confusion or difficulty. Through this, the team can discover if, say, the navigation is unintuitive, or error messages are unclear, and then refine the design. By catching and fixing UX issues (for example, ensuring the booking confirmation is obvious, or that the font is readable), testing makes the system more user-friendly

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. A system that is easy and pleasant to use will be readily accepted by patients and doctors. This support from usability testing means fewer users give up in frustration and more complete their tasks, directly contributing to the successful implementation and adoption of the eChannelling website.

(In summary, software testing supports successful implementation by ensuring the eChannelling system is functionally correct, reliable, secure, high-performance, and user-friendly. This comprehensive quality assurance prevents major failures and builds confidence for all stakeholders when the system goes live.)

4. Types of Software Testing to Ensure Quality

To guarantee the website's quality, a combination of **different types of software testing** is applied. Five relevant testing types are:

- **Functional Testing:** This type of testing checks whether each feature of the website works correctly according to the requirements. Testers will validate all functions – for example, searching for a doctor, booking an appointment, registration/login, and payment processing – to confirm they behave as expected. **Functional testing** can be done at various levels:

  - *Unit Testing:* developers test individual components (e.g. a date picker or form validation logic) in isolation.

  - *Integration Testing:* verifying that combined components (such as the booking form connecting to the payment gateway) work together properly.

  - *System Testing:* testing the entire eChannelling website as a whole to ensure all use-case flows function correctly. The goal is to catch any functional defects. For instance, if selecting a date doesn't filter doctors by availability, or if confirmation emails are not sent, functional tests will detect that. This ensures the core **functional quality** of the site is solid (all intended behaviors occur without bugs)

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- **Usability Testing:** Usability testing evaluates how easy and intuitive the website is for end users. Testers (or sample users) examine the site's interface, navigation, and content presentation to identify any user experience problems. For eChannelling, usability testing might look at things like: Can a first-time user easily figure out how to search for a doctor? Is the information on the screen clear (e.g., doctor names, available times, fees)? Are error messages (like for an invalid input) helpful? The aim is to ensure the site design is **user-friendly**, with logical workflows and clear interfaces. Any findings (such as a confusing button label or a cluttered layout) can be corrected to improve the overall UX. By performing usability testing, the team ensures that real users will find the website convenient and pleasant to use, which is a key aspect of quality. *(This type of testing does not focus on whether a feature works (that's functional testing), but on how the feature is experienced by the user)*

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- **Performance Testing:** Performance testing checks how the website performs under various conditions, especially its speed, responsiveness, and stability under load. There are subtypes like **load testing** (simulate many users or heavy usage to see if the site can handle it) and **stress testing**

(push the system beyond normal load to see its breaking point). For eChannelling, performance testing would involve monitoring how quickly pages load and transactions complete when, say, hundreds of users try to search and book simultaneously. It also looks at server response times, throughput, and resource usage. A related aspect is **scalability testing** – ensuring the system can scale up to handle growth (more hospitals, more users) without performance degradation. By doing performance testing, any bottlenecks (like slow database queries or memory leaks) can be identified and fixed. This type of testing ensures that the website's quality includes **fast response times and the ability to serve users efficiently**, providing a smooth experience even during peak usage.

- **Security Testing:** Security testing focuses on protecting data and preventing unauthorized access, crucial for a healthcare platform. Testers probe the website for vulnerabilities such as SQL injection points, cross-site scripting (XSS) flaws, insecure direct object references, weak encryption, etc. They will also verify that the **authentication and authorization** mechanisms work properly (e.g., user accounts are secure, one user cannot see another's appointment details). For eChannelling, which stores personal health information and payment details, security testing would include checking data encryption in transit and at rest, ensuring strong password policies and maybe two-factor authentication for accounts, and confirming that *only the right people can access sensitive functions*. A specific example is testing that no one can access other patients' booking information by manipulating URLs or IDs (to avoid the kind of data leak that was found previously). By performing thorough security testing, the team ensures the **quality of the website in terms of confidentiality and integrity** of user data. This helps prevent breaches or leaks, which is essential for maintaining user trust and meeting regulatory requirements

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- **Compatibility Testing:** Compatibility testing ensures that the website works well across different user environments. This includes testing on various **browsers** (Chrome, Firefox, Safari, Edge, etc.), different **devices** (desktop, laptop, tablets, various smartphones), and different **operating systems** (Windows, macOS, Android, iOS). Because eChannelling's users may access the service on a range of devices or browsers, the site's layout and functions should remain consistent. Testers will verify things like: Does the site render correctly on mobile screens? Are all interactive elements (menus, forms, buttons) usable on touch screens as well as with mouse/keyboard? Are there any browser-specific issues (for example, something working in Chrome but not in Safari)? Compatibility testing may also cover **different screen resolutions** and **older versions** of browsers if a significant portion of users use them. By doing this testing, any issues such as layout breakages or functionality glitches in certain environments can be addressed. This ensures the website's quality is **consistent for all users**, no matter how they access it

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. (In the context of eChannelling, this type of testing complements performance and usability testing to guarantee, for instance, that a user on a mobile phone has an equally effective experience as one on a desktop browser.)

*(Other types of testing could also be relevant, such as **Regression Testing** – re-testing the system after changes to ensure no new bugs were introduced – and **User Acceptance Testing** – having end-users verify the system in a real-world scenario. However, the five types above are among the most important to ensure the overall quality of the website's functionality, usability, performance, security, and compatibility.)*

5. Identified Defects and Software Defect Reports

In reviewing the eChannelling website, we identified **five defects or issues** affecting its quality. Below is a summary of each defect along with a structured defect report outlining the problem and expected vs. actual behavior:

1. **Sensitive Data Exposure on Public Page**

   o **Description:** A serious security flaw was discovered where a publicly accessible page on the eChannelling site allowed anyone to extract sensitive patient data without authentication. In other words, personal details (such as patient names, National ID numbers, phone numbers) and appointment information (doctor, hospital, date) were visible to unauthorized users

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. This is a **data privacy violation** that could compromise thousands of users' confidential information.

   o **Steps to Reproduce:** (Before the issue was fixed) An attacker or curious user could navigate to a specific URL or use a hidden search page on the website that listed patient appointment records. No login was required to access this page. For example, entering a query or an ID on this page would return matching patient appointment details.

   o **Expected Result:** Sensitive patient information should **never be accessible publicly**. Such data should be protected behind secure login controls. Only authorized parties (the patient themselves, or relevant doctors/admins) should be able to view personal data, and only as necessary. If an unauthorized user tries to access that page or data, the system should block it (showing a login page or an error message).

   o **Actual Result:** The site **exposed private data** openly – the page returned personal records to anyone who knew how to find it. There were no access controls or encryption preventing the data from being read. This meant an unauthorized person could harvest patient details en masse, leading to a severe breach of privacy.

   o **Severity: Critical (High)** – This defect is a major security issue. It undermines user trust and violates data protection principles. Such a breach could lead to legal consequences and reputational damage. **Immediate fix required**, such as removing or securing the page, and notifying affected users.

2. **Lack of Sinhala/Tamil Language Support**

   o **Description:** The eChannelling website's user interface is available only in English. There is **no option to switch the site to Sinhala or Tamil**, the two local official languages of Sri Lanka. This is an interface/design shortcoming that affects usability for many local users.

   o **Steps to Reproduce:** Visit the website and look for language selection options. All content, menus, and forms are presented in English by default, and no toggle for Sinhala or Tamil is present on the homepage or settings. Even when navigating through various pages, the text remains only in English.

   o **Expected Result:** The website should ideally provide **trilingual support** (English, Sinhala, Tamil) to cater to Sri Lanka's user base. A language selector or separate localized

sites should be available, allowing users to read instructions and prompts in their preferred language. This would meet the customer requirement of accessibility for non-English-speaking users and align with national language policies.

- o **Actual Result:** Users who are not comfortable in English may struggle with the site. For example, an elderly Sinhala-speaking user might find it hard to understand the booking instructions in English. Currently, such users have to seek help or switch to the mobile app integrated with a Sinhala-language platform (e.g., via Helakuru app) as a workaround. The absence of Sinhala/Tamil support on the main site means the site is **not fully accessible** to a significant portion of its target audience.

- o **Severity: Medium** – While the core functionality works, this is a usability and localization defect. It does not crash the system, but it **limits the user base** and could lead to user frustration or exclusion. In a country where many users prefer Sinhala or Tamil, not addressing this could reduce the platform's effectiveness. It should be fixed to improve inclusivity, though it may not pose an immediate operational failure.

3. **Poor Mobile Responsiveness (Layout Issues on Mobile Devices)**

- o **Description:** The website is not fully optimized for mobile browsers. When accessed on a smartphone, the layout and interface elements do not adapt properly. Some pages require excessive zooming or scrolling, and certain buttons or text overlap on small screens. This indicates a **responsive design defect** in the site's front-end implementation.

- o **Steps to Reproduce:** On a mobile phone (e.g., a 5.5-inch Android device using Chrome), navigate to the eChannelling homepage and attempt to search for a doctor. Observe that the menu and search fields might not resize correctly. For instance, the "Find a doctor" form might extend beyond the visible screen, or text might appear cut-off. Additionally, on the appointment results page, the table of available times might require horizontal scrolling. Compare this with the desktop experience.

- o **Expected Result:** The website should use a **responsive web design** that automatically adjusts content for different screen sizes. On a mobile device, all content should stack or resize so that no horizontal scrolling is needed, text is legible without zoom, and buttons are appropriately sized for tapping. The user should be able to complete all actions (searching doctors, filling forms, making payments) on a smartphone just as easily as on a desktop. If the site detects a mobile browser, it might even simplify the layout (or suggest using the dedicated app) in a user-friendly way.

- o **Actual Result:** On mobile, the user interface is **cumbersome**. Some critical information or buttons may be off-screen until the user manually zooms out or scrolls. For example, the "Book Now" button might be partially hidden, or the navigation menu might not collapse properly into a mobile-friendly menu icon. These issues make it difficult to use the site on the go. In some cases, users might get frustrated and abandon the process or be forced to download the mobile app instead of using the web.

- o **Severity: Medium** – This is a usability defect affecting mobile users. Since many users in Sri Lanka access the internet primarily via mobile devices, poor mobile web experience can significantly impact the service's reach. It does not stop the site from functioning, but it **impairs the user experience** and could lead to lost bookings or user drop-off on mobile

browsers. Addressing this (through responsive design fixes or a mobile-specific site) is important for quality consistency across platforms.

4. **Inefficient Doctor Search and Booking Workflow**

   o **Description:** The process of searching for a doctor and booking an appointment on the website is not as user-friendly or efficient as it could be. The interface design requires users to go through multiple steps and pages, and it lacks advanced filtering options. This is an **interaction design defect** where the user journey is more complicated than necessary, potentially confusing users.

   o **Steps to Reproduce:** Try to book a consultation for a specific type of doctor:

      1. On the homepage, click on "Find a doctor" (or a similar call-to-action). The site might prompt a hospital or location first, instead of allowing a general search.

      2. Select a hospital from a lengthy drop-down list. (Notice there's no quick filter or suggestion – the user must scroll through many entries if they don't know the exact hospital).

      3. Next, select a specialization or doctor. This may be another long list, often not filtered by the previous choice effectively (e.g., showing all doctors rather than only those at that hospital).

      4. Then pick a date or time slot from yet another page or list.

      5. Only after these steps, the site shows available appointment slots to book. During this process, if any step has no results (for example, choosing a hospital then a specialization that isn't available there), the user might have to start over. There may not be an easy way to modify the search criteria on the fly.

   o **Expected Result:** A **streamlined search and booking system**. Ideally, the website should allow searching by multiple criteria in one go (for example, entering a doctor's name or specialization and optionally a location or date, then seeing all matching options). Modern design would have a single search bar or a clearly guided form. Filters could include **specialty, doctor's name, hospital, and date availability**, all adjustable on one page. The interface should guide the user smoothly, with minimal page reloads – for instance, dynamic filtering or a wizard that remembers previous inputs. Overall, the booking workflow should be intuitive: the user knows at each step what to do and can reach a booking confirmation in as few clicks as possible.

   o **Actual Result:** The current workflow feels **clunky and unintuitive**. New users may not understand why they must select a hospital first (when they might prefer to see all hospitals for a given specialty or doctor). The lack of a free-text search (e.g., typing a doctor's name directly) slows down the process. If a mistake is made or a selection has no results, the user doesn't get helpful guidance on how to adjust. For example, after selecting "General Hospital" and then searching for a dermatologist, if none are available, the site might just show "No sessions available" without suggesting an alternative. This rigid step-by-step approach can frustrate users who are used to more flexible search on modern websites. It also increases the time taken to book an appointment. In summary, while the system works,

it is **not as efficient or user centric as expected**, which could lead to user error or abandonment.

- o **Severity: Low to Medium** – This is a usability/design defect. It does not produce an error in the software, but it **impacts user satisfaction and efficiency**. Patients can still eventually book a doctor, but the cumbersome process may deter fewer patient users or those who are not tech-savvy. Improving this workflow would enhance the quality of the service, but even as-is, it's functional. Thus, it's a moderate priority to fix for better user retention.

5. **Performance Slowdowns During Peak Times**

- o **Description:** The website experiences **performance issues under high load**. During certain peak hours of usage (for example, early morning or late evening when many people are online, or when a popular doctor opens new appointment slots), pages become sluggish to load. There have been instances of search results taking a long time to appear, or the booking submission hanging before confirmation. In some cases, users reported timeouts or error messages when the system was busy.

- o **Steps to Reproduce:** This issue is intermittent and depends on the load. One way to observe it is to simulate a high number of concurrent users:

  - Use a testing tool or script to simulate, say, 50-100 simultaneous appointment searches on the site, all around the same time.

  - Monitor the response times for each search and the server's behavior.

  - Alternatively, during a real busy hour (such as 8 PM when many might be booking for the next day), try performing normal user actions: log in, search for a specialist, and proceed to book. Note if each step is slower than usual or if any step fails.

- o **Expected Result:** The website should handle expected peak loads **gracefully**. This means maintaining acceptable response times (e.g., search results within a few seconds) and not timing out. The infrastructure (servers, databases) and code should be optimized to scale under heavy traffic, perhaps by queueing requests or using load balancers. Users might expect a slight slowdown with heavy use, but it should not prevent them from completing a booking. The system's quality standard should be that it stays stable and functional even as usage spikes.

- o **Actual Result:** Under heavy load, the site's **performance degrades noticeably**. Search that normally take 1-2 seconds might take 10-15 seconds or more, and some pages may fail to load entirely (showing an error or a blank page that forces the user to refresh). For example, at peak time a user might click "Search" and see a loading spinner that lingers, or an appointment booking might not confirm immediately, causing uncertainty (leading some users to click again and possibly double-book). In worst cases, the site might become unresponsive for a short period. These slowdowns indicate that the current system is struggling with high demand, which can result in poor user experience exactly at the moments when users most need it to work.

- o **Severity: High** – This is a performance defect that can seriously affect many users at once. While not a constant problem, when it occurs it can prevent users from booking in a timely

manner (imagine failing to book a limited slot because the site was too slow). It directly impacts on the reliability and reputation of the service. From a quality assurance perspective, this should be addressed to ensure the platform can reliably serve its user base. Solutions might include performance tuning or increasing server capacity. Until fixed, it poses a risk to user satisfaction and the system's success during high-traffic events.