



# Digital Friction in Public Services: A UX Assessment of the DOTM License Platform in Nepal

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## Abstract

While e-governance platforms are intended to improve access to public services, many government websites continue to fall short in terms of usability. The Department of Transport Management (DOTM) portal in Nepal, which is used for driving license applications and vehicle registration, reflects several of these challenges. This study looked at the DOTM portal using Jakob Nielsen's heuristics and feedback from 119 users over two weeks. The main problems were a cluttered layout, confusing navigation, poor system feedback, and bad mobile performance. Users also mentioned broken links, and CAPTCHA issues that made them start over. Based on both the users' feedback and the heuristic evaluation, five key usability problems emerged, lack of simplicity and visual clarity, limited access to help or documentation, design inconsistencies across pages, difficulty recognizing navigation elements, and unclear system status. These issues not only complicate the user experience but also make it harder to complete essential tasks. Accessibility was another major concern, with screen reader support largely non-functional. To address these problems, the study proposes a redesigned interface with clearer visual structure, consistent navigation, and more helpful system responses. Although the focus is on DOTM, the findings may reflect broader patterns across public digital platforms and highlight the need for more user-centered design in government services.

**Keywords:** E-governance usability, Heuristic evaluation, Government portal design, Digital public services

## 1. Introduction

E-governance has become an essential component of modern governance, particularly in developing nations like Nepal, where public service delivery has historically been challenged by inefficiency and limited accessibility [1, 2]. Implementing digital solutions in public administration offers not just a technological upgrade but a transformative opportunity to reduce bureaucratic hurdles, enhance transparency, and improve service delivery to millions of citizens [1, 3, 4]. When implemented efficiently, digital governance platforms improve citizen trust, promote institutional accountability, and also support economic growth [3, 4].

A relevant illustration of this transition can be observed in Nepal's Department of Transport Management (DOTM), tasked with essential services like vehicle registration, transportation infrastructure, and the issuance and renewal of driving licenses. These services have a direct effect on the daily lives of people throughout the nation. The DOTM's official website [?] acts as a central digital gateway, allowing users to apply for licenses, renew documents, verify registration status, and access other related services online. Due to the large number of users, the site's functionality and accessibility are essential to how the public views Nepal's e-governance initiatives. A poorly designed digital platform can lead to user dissatisfaction, task abandonment, and reduced trust, while a properly operating system enhances the credibility and efficiency of digital public services [2, 3].

### 1.1. Problem Statement

The DOTM website is supposed to make things easier for people, but in reality, it often does the opposite. The layout is cluttered, it doesn't function properly on mobile devices, and the overall de-

sign is confusing. When it comes to important tasks like applying for a license or verifying your registration, users frequently feel frustrated or confused. This is even harder for people who aren't very tech-savvy or who live in rural areas with slow internet. Many just give up and go to the office in person, which defeats the whole purpose of going digital. In a country like Nepal, where access and digital literacy aren't equal, a badly designed government platform creates more problems than it solves.

## 2. Literature Review

### 2.1. Usability and User Experience in E-Governance

Usability is basically about how easily and effectively someone can use a system to complete a task. According to ISO 9241-11, it is defined as how well specific users can achieve specific goals with efficiency, effectiveness, and satisfaction [1]. Jakob Nielsen divides it into five key factors: the ease of learning, the speed of use, the retention of information by users, the frequency of mistakes, and the level of user satisfaction [5].

UX goes beyond functionality; it looks at how users feel during the process. This includes emotions, behavior, and how people interact with the system overall [4]. Considering e-Governance platforms, usability and UX are important since poor design directly affects how individuals interact with public services.

In fact, studies have shown that the average usability score for government websites globally is only around 36.2%, showing how common and serious these problems are and why they need attention [2].

## 2.2. Common E-Government Website Challenges

Government websites in developing countries face the same design problems repeatedly. Things like confusing navigation, pages that don't load properly on phones, messy layouts, and no useful feedback when something goes wrong are far too common [3, 4].

These issues are worse in places where digital literacy isn't the same across the population. For example, users in Nepal might not have a good knowledge of or be familiar with government websites, particularly individuals from rural regions or older age groups [1]. And when you add things like long procedures, limited access to devices, or just too much information thrown at once, it becomes even harder for users to get what they need from these platforms.

In addition, people's behavior with technology often depends on how comfortable or stressed they feel in the moment. That's why designing systems that are simple, intuitive, and forgiving really matters [4].

## 2.3. Heuristic Evaluation Framework

A reliable way to assess how user-friendly a system is involves heuristic evaluation. Introduced by Nielsen and Molich, this method allows usability experts to review a system based on a defined set of usability principles without the need for large groups of users or costly testing setups [5]. This makes it particularly suitable for evaluating government websites, especially in situations where resources are limited.

The most commonly used set of principles is Nielsen's 10 usability heuristics. These address critical elements like keeping users informed about system status, using language that feels familiar, giving users the ability to undo actions, preventing errors, and creating clean, focused interfaces. Other principles emphasize helping users recover from mistakes, speeding up interactions for experienced users, and providing helpful guidance or documentation when needed [5].

Applying this method to the DOTM website helps us spot specific usability issues and propose practical improvements rooted in established human-computer interaction (HCI) practices.

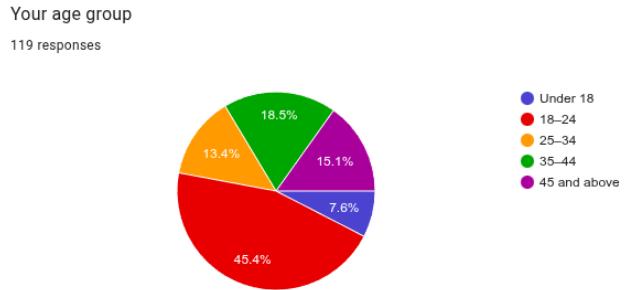
## 3. Results

### 3.1. Survey Data Collection Overview

A total of 119 participants completed the user experience survey over a 2 week period from 10 June 2025 - 24 June 2025. The survey was distributed using the snowball sampling method, where the participants were encouraged to share the survey in their network who had used the DOTM portal.

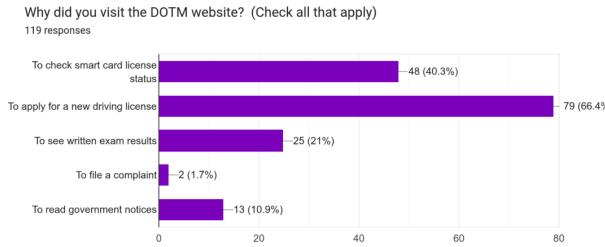
#### 3.1.1. Demographic Profile of Participants

The survey participants represented a diverse cross-section of the DOTM portal user, with the ages ranging from less than 18 to 45 and above. Table 1 presents the demographic breakdown of the survey.



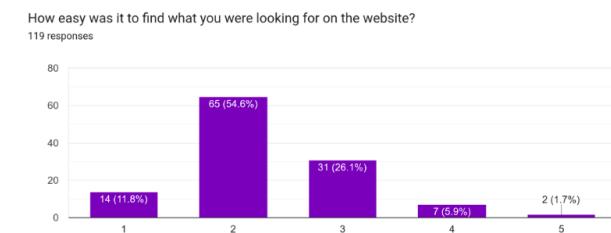
**Figure 1:** Age Group Distribution of Survey Respondents

Additional demographic characteristics include the device used to access the DOTM portal, most used their phone or laptop, while none used tablets. Along with that, the kind of services users used the portal for, like license renewal, checking print status, file a complaint or to read the government notices. Maximum users (66.4%) were found to use the DOTM portal to apply for a new driving license.



**Figure 2:** Purposes for Accessing the DOTM Portal Among Survey Respondents

The survey also included questions about how easy it was for the users to find the information on the DOTM portal based on the Likert scale. 1 being "Extremely Difficult" and 5 being "Easy", it was found that a majority of respondents (54.6%) found it difficult to find informations on the DOTM portal.



**Figure 3:** User responses on how easy it was to find information on the DOTM portal (Likert scale)

### 3.2. Reported Issues While Using the DOTM Portal

For the qualitative analysis, users were asked an open-ended question: "What problems did you face using the DOTM portal?" The issues users faced on the portal are listed below:

**Navigation Issues:** The layout of the site was confusing. Users had trouble finding the main services they needed.

**Broken Links:** Some links and buttons didn't respond or directed users to pages that no longer existed.

**Captcha Errors:** The captcha often failed to load, which made it impossible to proceed further in the process.

**System Crashes:** In many cases, the system crashed during form submission or other steps. This forced users to start over multiple times.

**Language Access:** On mobile devices, the portal opened in Nepali, and there was no clear option to switch to English.

**Processing Delays:** Even after form submission, users faced delays that lasted for days. The system froze at different steps and support was not easily available.

**PDF Dependence:** Most important information was only available through downloadable PDF files, which made it harder for users to view or interact with the content easily.

**Unavailable Services:** Key features like license renewal or application tracking often failed to load or stayed inactive.

**Search Confusion:** While searching online, outdated or broken DOTM links appeared on top, which added to the confusion and caused users to land on incorrect pages.

**Help and Feedback:** The users are required to visit the office in person, as there is no online help and feedback system on the portal.

Based on the responses, the most common issues included confusing navigation, broken links or, unresponsive buttons, and an unfriendly mobile interface.

### 3.3. Critical UX Issues

#### 3.3.1. Violation of the Heuristics #8: Aesthetic and Minimalist Design

The portal shows a severe violation of aesthetics and minimalist design principles through cluttered interface elements and inconsistent visual hierarchy. The heuristic evaluation displayed that multiple blue tiles consisting of identical visual weights, creating confusion about primary actions such as license renewal or print status checking. Visual components also lack unification, with the blue "Check Status" and red "View All" buttons clashing through the theme of the interface, and the header navigation consists of excessive categories including the "Organization", "E-Services" and "Driving License" without clear grouping. The dropdown menus are dense and cluttered, increasing the cognitive load for users.

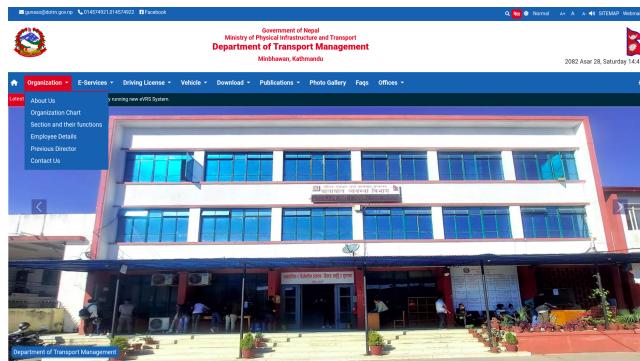


Figure 4: DOTM portal homepage with cluttered navigation bar and unorganized dropdown menus

#### 3.3.2. Violation of the Heuristics #10: Help and Documentation

The portal demonstrates failures in providing enough guidance and feedback for user actions in essential areas. The heuristic evaluation identified that the Smart Card Driving License Print Status field lacks real-time error or success feedback. The captcha system

frequently fails to load properly, effectively blocking users from accessing essential services, also no clear instructions are provided for common tasks such as license renewal procedures.

#### 3.3.3. Violation of the Heuristics #4: Consistency and Standards

The portal shows inconsistencies in design patterns, navigation structure, and information architecture that violates established usability standards. The heuristic evaluation also revealed redundant navigation elements with identical links, such as "Online Driving License System" appearing under multiple tabs, forcing users to rely on trial and error rather than intuitive navigation. Date formats are inconsistent and alternate between AD and BS without standardization, causing confusion about the information relevance. File organization is scattered all across the "News," "Downloads," and "Publications" sections with no clear labeling system. The language accessibility issues persist with the mobile app defaulting to Nepali without a visible toggle option.

S.N.	Subject	Issue Date	Download
1	New Public Vehicle Fare Rate effective 2081 Poush 22.	2025-01-06	Download
2	Fare rate of inter province public transport (including deluxe and super deluxe fares) effective from 31st Shrawan 2080.		Download
3	New Public Vehicle Fare Rate effective from 2080 Dashain 31.	2020-04-30	Download

Figure 5: DOTM portal showing inconsistency in date formats

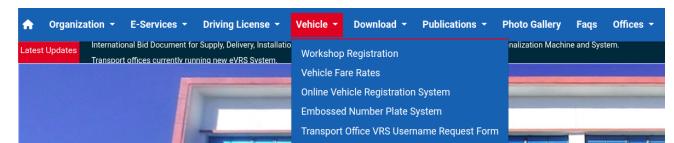
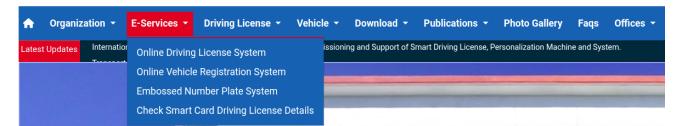
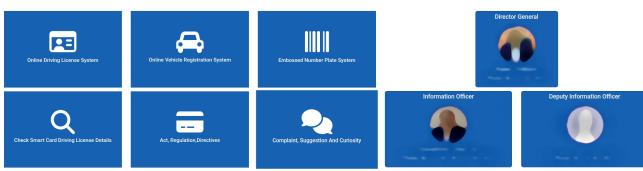


Figure 6: Multiple occurrences of the "Online Driving License System" and "Embossed Number Plate System" link

#### 3.3.4. Violation of Heuristic #6: Recognition Rather Than Recall

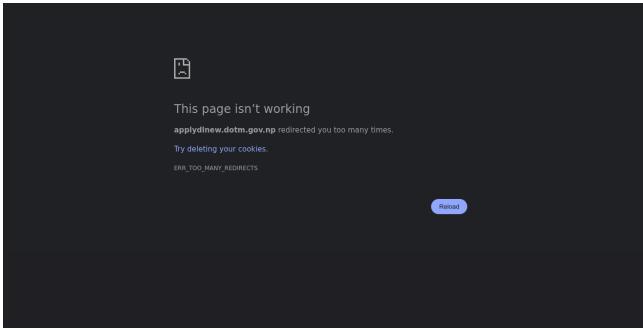
The portal requires users to memorize information and navigate through trial-and-error processes rather than providing intuitive recognition signals that support natural user behavior. The heuristic evaluation found that search results display titles and descriptions with equal visual weight, making efficient scanning difficult for users seeking specific information. Generic link labels such as "View All" provide no contextual information for users attempting to understand their purpose. While the information cards featuring Director General and Deputy Info Officer details appear with equal visual importance as the primary services. The absence of a clear visual hierarchy fails to guide users toward primary actions, forcing them to remember locations and processes.



**Figure 7:** DOTM homepage showing action and info cards with equal visual weight, reducing clarity of primary tasks

### 3.3.5. Violation of Heuristic #1: Visibility of System Status

The portal does not really give users enough feedback about what is happening when they interact with the system. There is often no clear sign whether something worked or not. During heuristic evaluation, it was noticed that form submissions do not show any real-time confirmation, and when the captcha fails to load, there is no message explaining the issue or what to do next. Also, loading indicators are absent to show if something is processing, and broken links just lead to dead ends without any kind of error message or alternative option. This leaves users confused and unsure if their actions like submitting an application, were actually completed, which adds stress, especially during important tasks.



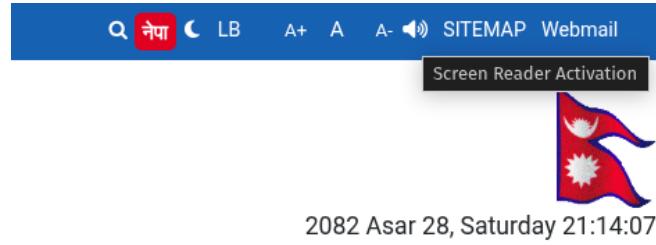
**Figure 8:** Intermittent “This page isn’t working” error on the DOTM portal, caused by unstable or partially broken links

Additionally, the system’s availability is not very clear. For example, when an attempt was made to register and generate an MPIN on a Saturday, the code only arrived on Sunday morning. This delay made it seem like the site might not function properly on weekends, but there was no message or notice anywhere about that. It just leaves users guessing.

### 3.3.6. Violation of Accessibility Standards: Screen Reader Inconsistency

The screen reader functionality on the homepage of the DOTM portal seems to exist only on the surface, but not in any meaningful or usable way. When tested with a modern screen reader like Orca, the experience was frustrating and unclear. Instead of reading out proper link labels, the screen reader reads long, confusing strings like “visited link 9821872.” This indicates poor HTML markup and missing descriptive labels, which makes it difficult for visually impaired users to understand where links lead or what they represent [6, 7, 8].

Clicking on the screen reader icon provided on the portal leads to a page listing three external screen reader tools. However, two of these links are broken, and the only working one directs to SAToGo – an outdated screen reader that depends on Internet Explorer and no longer functions in modern browsers [9, 10]. Simply placing a screen reader icon without proper functionality or updated tools misleads users and diminishes trust in the portal’s accessibility commitment [11, 8].



**Figure 9:** DOTM portal showing screen reader activation icon

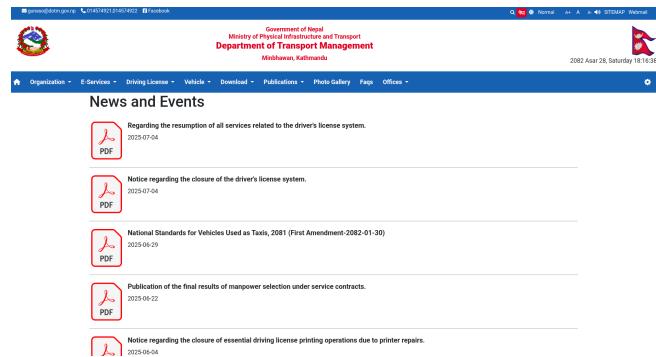


**Figure 10:** Screen reader activation icon leading to an informational page listing screen readers.

## 3.4. Moderate UX Issues

### 3.4.1. Violation of Heuristic #3: User Control and Freedom

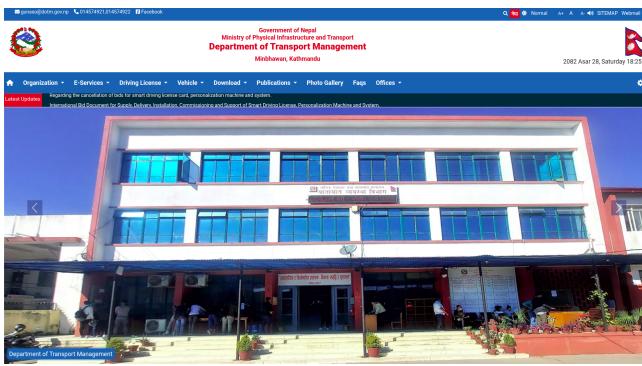
The portal really limits what users can do, especially on mobile. People often get stuck in certain parts, like the map section, with no easy way to get back to the top or navigate out smoothly. That creates a lot of frustration. Much of the information is only available as PDFs, which is inconvenient because users cannot easily search within them and have less control over how they access the content. Important actions lack clear prioritization, forcing users to navigate multiple steps to complete simple tasks. Additionally, outdated notices from 2080 BS (2023 AD) are still visible, which makes the site feel old and less reliable.



**Figure 11:** DOTM portal displaying news and notices as downloadable PDFs

### 3.4.2. Violation of Heuristic #3: User Control and Freedom

The portal uses language and categories that feel more like they are designed for the organization’s convenience rather than how users think or work. The navigation is not set up around how users would naturally complete their tasks, and the English version does not have fluent translations and mistakes that make the site feel less professional and harder to understand. Also, the default normal view contains things like internal events “Farewell program” or “Token system launch” take up the best spots on the homepage, while important services get pushed down where users might miss them, whereas the label ‘Low Bandwidth (LB)’ is not intuitive enough for users to understand that clicking it will remove all images.



**Figure 12:** Important service sections on the DOTM homepage obscured by large banner visuals

### 3.5. Triangulation Method Results

The triangulation analysis compared heuristic evaluation findings with user-reported issues to validate problem severity and impact.

**Navigation Problems:** The heuristic evaluation found cluttered layouts and a lack of visual hierarchy, while users frequently described the site as confusing and reported difficulty locating key services.

**System Reliability Issues:** Experts noted missing feedback mechanisms, no loading indicators, and many broken links. This strongly aligned with user complaints of frequent system crashes, captcha errors, and unresponsive buttons.

**Mobile Interface Problems:** The portal failed to adapt well to mobile screens in both design and usability. The heuristic evaluation showed responsiveness issues and navigation traps. Users confirmed this by pointing out that the mobile site defaulted to Nepali without a clear toggle and was hard to use.

**Consistency Standards:** Expert reviewers highlighted redundant navigation options and inconsistent date formats across the portal. While users mentioned general confusion while navigating, most didn't explicitly notice these inconsistencies.

**Information Architecture:** The evaluation found poorly organized content, with scattered files and a strong reliance on downloadable PDFs. Users acknowledged the inconvenience but seemed to consider it a normal part of using the portal rather than a usability flaw.

The triangulation confirmed that critical heuristic violations directly translate to user frustration and task abandonment. Issues classified as "critical" consistently appeared as major barriers in user reports, while "moderate" issues were described as inconveniences rather than complete blockers. This validation supports prioritizing heuristic violations for immediate remediation.

## 4. Discussion and Recommendation

### 4.1. Discussion

The usability issues in the DOTM portal reveal barriers that affect how citizens interact with essential government services[12]. These problems go beyond simple interface annoyances and create real obstacles for users trying to complete important tasks like license renewals or status checks.

The cluttered design throughout the portal creates excessive cognitive load[13]. When users land on the homepage with its multiple blue tiles of identical visual weight, they process far more information than necessary to identify basic actions. This becomes problematic when combined with the inconsistent naviga-

tion structure, where links like "Online Driving License System" appear under multiple tabs without a clear distinction. Users end up spending mental energy figuring out the interface rather than focusing on their actual goals.

The poor error messaging represents another failure point. When the captcha system fails to load or users encounter the "This page isn't working" message, they are trapped with no clear path forward. This is damaging for government services where task failure can have serious consequences; citizens may miss deadlines, face penalties, or simply give up on service requests entirely. The lack of system feedback violates basic usability principles and creates unnecessary stress during what should be routine interactions[14, 15].

Consistency problems throughout the portal undermine users' ability to build reliable mental models of how the system works. Relative navigation elements and inconsistent date formats (changing between AD and BS) force users to constantly adjust their expectations. This trial-and-error approach to navigation contradicts established usability principles that emphasize predictability and learnable patterns[16, 13].

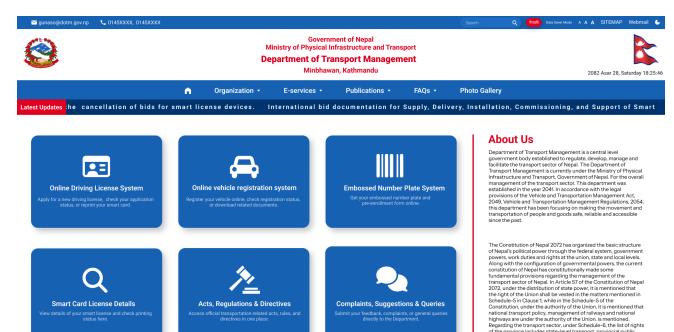
The accessibility issues, like the non-functional screen reader support, highlights a more serious problem of digital exclusion. The presence of a screen reader icon without functionality creates false expectations for users with disabilities and may worsen their experience. This represents not just poor usability but a failure to provide equitable access to government services[6, 2].

These usability issues are not isolated to the DOTM portal alone; they reflect a pattern that has been observed across many government digital services. Prior research shows that when government websites fail to meet usability expectations, it often leads to a noticeable drop in citizen satisfaction and can significantly reduce the likelihood of people using those services at all[3, 1, 4]. Over time, these seemingly small friction points accumulate—creating what some researchers refer to as "digital friction." This friction doesn't just make tasks harder; it actively discourages users from engaging with government platforms. In turn, this can erode trust in public digital initiatives and weaken efforts aimed at digital transformation in the public sector.

### 4.2. Recommendations

Based on the identified issues and user feedback, a set of design recommendations has been visualized in the form of high-fidelity mockups. These solutions address the critical usability problems while improving overall system effectiveness and accessibility.

#### 4.2.1. Redesigned Homepage



**Figure 13:** Redesigned Homepage

The proposed design uses a clean, card-based layout that addresses the visual hierarchy problems identified in the heuristic

evaluation. The navigation structure has been reorganized to reduce cognitive load by grouping related functions logically. Offices are now integrated under the "Organization" section, while driving license and vehicle services are consolidated under "E-Services." The Downloads section has been moved under Publications for better information architecture.

Key services such as "Apply for License" and "Check Status" receive visual priority through distinctive icons and prominent calls-to-action. Information about the Director General, Information Officer, and Deputy Information Officer has been moved to an "Employee Information" subsection under Organization, removing these secondary details from the primary homepage real estate. This reorganization allows users to focus on their primary tasks without being distracted by organizational information.

#### 4.2.2. Redesigned Status Check Interface

Figure 14: Redesigned Status Check

The new status check component maintains consistency with the homepage design while addressing the system feedback issues that were identified. The interface keeps the same navbar structure and "Government of Nepal - Department of Transport Management" header across all pages, creating a coherent user experience. The original purple color scheme has been replaced with blue to maintain theme consistency throughout the portal.

The redesigned component provides real-time validation with clear error and success messages, addressing the feedback vacuum that users previously experienced. The UI format has been made consistent with the license system, ensuring that users encounter familiar patterns when entering information across different parts of the portal.

#### 4.2.3. Redesigned Online License System

Figure 15: Redesigned Online License System

This solution addresses the language accessibility issues where the language toggle was not available across all pages. The redesigned system maintains a consistent top navbar that includes

the language option, ensuring users can switch languages regardless of which page they are viewing. The original purple navbar has been replaced with blue to match the overall theme.

The system now provides multilingual instruction availability while keeping the language toggle accessible through the persistent navbar. This addresses the frustration users experienced when they lost language functionality while navigating between different sections of the portal.

#### 4.2.4. Enhanced Publications and Notice Board

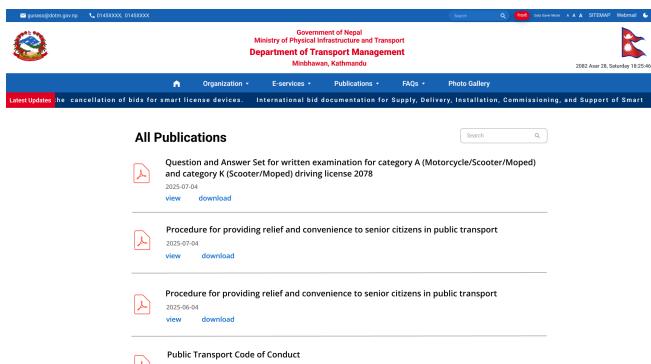


Figure 16: Enhanced Publications and Notice Board

This solution transforms the PDF-heavy content delivery system that was identified as a major usability barrier. Instead of forcing users to download PDFs to view content, the new interface provides an on-page PDF viewer with search functionality. Users can now quickly scan through documents to find relevant information without downloading multiple files.

The interface design has been modernized with consistent fonts, spacing, and layout patterns that align with the news and notices pages. The search functionality allows users to find specific documents efficiently, while the dual access approach maintains PDF download capability for users who prefer offline access. This solution addresses the outdated appearance of the original interface while significantly improving content accessibility.

## 5. Conclusion

This study looked into the usability issues of Nepal's Department of Transport Management (DOTM) portal and found several challenges that stop users from accessing important government services smoothly. By combining expert evaluation with a user survey involving 119 participants, we found major problems like cluttered design, broken links, and non-working features like captchas, all of which directly impact how well users can complete their tasks.

What stood out is that these problems are not just frustrating; they are causing people to give up and go back to visiting government offices in person. That goes completely against the point of putting services online in the first place. Small design issues, like too many blue tiles on the homepage or inconsistent navigation, build up and make the whole experience overwhelming, especially for users with low digital skills or those on slow internet connections. Even worse, when citizens keep running into broken or confusing systems, they start to lose trust, not just in the site, but in the government's ability to offer any reliable digital services. This loss of trust has long-term effects on Nepal's push for digital transformation.

To solve this, we proposed changes that go beyond just how things look. The redesigned homepage highlights the most-used services with clearer visual focus. We improved the license status

check with real-time feedback, and made the publication section easier to explore, moving away from the PDF-only model.

These are not just design tweaks; they represent a more user-focused approach. By organizing services based on user needs, using consistent language options, and improving how errors are shown, the portal becomes much easier to use. We used both expert feedback and real user input, which helped confirm that the problems we found were real and serious, not just theoretical. This kind of approach is especially important in countries like Nepal, where digital skills and access vary a lot across users. Government websites like this should include usability testing and user feedback as a regular part of development, not just something done at the end. Poor usability doesn't just waste time; it holds back the entire goal of bringing public services online.

Future improvements could include built-in analytics to track user activity, regular accessibility checks, and feedback options directly on the portal. These steps would help keep the platform up to date with users' real needs. This project shows how critical good usability is in public service websites. When done right, these platforms can really improve how people access services, save time, and build trust in digital government. In the long run, better usability helps both the people using the services and the government teams providing them.

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