

**VIETNAM NATIONAL UNIVERSITY HO CHI MINH CITY
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY
FACULTY OF COMPUTER SCIENCE AND ENGINEERING**



WEB PROGRAMMING

MUSIC ECOMMERCE WEBSITE - HIPHOP

Major: Computer Science

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ID	Name	Shared work	Personal work
2110193	Đỗ Nguyễn An Huy	<ul style="list-style-type: none">• Design application's MVC architecture• Design user's templates• Design admin's templates• Implement user administration system	#1 <ul style="list-style-type: none">• Home page• Contact page• Home page management• Contact management

Chapter I: Introduction

Music is our passion. As an idea, we have incorporated music into this assignment, and built a music instrument ecommerce website.

We're directly inspired by the design of the MusicPlace (<https://musicplace.com/>), which is a website that aims to teach children music courses. The design is bright, colorful and friendly, so we decided to challenge ourselves with this design. This website mainly acts as a marketing media that is within accessible reach to everyone. It contains information about various courses, snippets of their classes and user reviews. It also shows guidance on how to register their courses and provide customer service.

Our website is similar to theirs in the interface, but we're focused on the ecommerce aspect: our website acts as a platform that customers can view and purchase music instruments, instead of for pure informational purposes. Besides that, our website also contains various marketing information.

The stack we've chosen:

- Vanilla Javascript for the frontend, with the aid of jquery.
- TailwindCSS for ease of building user-friendly and responsive websites.
- Pure PHP backend.
- MySQL as the database management system.

Chapter II: Technology

2.1 jQuery and Pure JavaScript

2.1.1 Advantages

- Simplifies DOM manipulation and AJAX requests with concise syntax
- Broad browser compatibility and extensive plugin ecosystem
- Combined with pure JavaScript for optimal performance where needed
- Lightweight compared to full frameworks

2.1.2 Disadvantages

- Somewhat outdated compared to modern frameworks (React, Vue)
- Can lead to spaghetti code in larger applications if not properly structured
- Performance overhead for simple DOM operations compared to vanilla JS

2.2 Tailwind CSS

2.2.1 Advantages

- Utility-first approach enables rapid UI development
- Highly customizable through configuration
- Reduces CSS file size in production with PurgeCSS
- Consistent design system through predefined values

2.2.2 Disadvantages

- Steep learning curve for developers used to traditional CSS
- HTML can become verbose with multiple utility classes
- Requires build process for optimal production performance

2.3 MySQL

2.3.1 Advantages

- Reliable and well-established relational database
- Excellent documentation and community support
- Good performance for structured data
- Strong data integrity through ACID compliance

2.3.2 Disadvantages

- Scaling horizontally can be challenging
- Less flexible than NoSQL databases for rapidly changing data structures
- Performance can degrade with very large datasets without proper optimization

2.4 PHP

2.4.1 Advantages

- Specifically designed for web development
- Easy to deploy and widely supported by hosting providers
- Large ecosystem of libraries and frameworks
- Simple learning curve for beginners

2.4.2 Disadvantages

- Inconsistent function naming conventions
- Performance limitations compared to compiled languages
- Type safety issues in older versions (improved in PHP 7+)

2.5 AJAX

2.5.1 Advantages

- Enables asynchronous data loading without page refreshes
- Improves user experience with dynamic content updates
- Reduces server load by fetching only required data
- Seamless integration with jQuery

2.5.2 Disadvantages

- Can complicate application state management
- Requires careful error handling
- Potential accessibility issues if not implemented properly

2.6 Security vulnerabilities and mitigations

2.6.1 SQL Injection

2.6.1.1 Vulnerability

Raw SQL queries with unsanitized user input allow attackers to manipulate database queries.

2.6.1.2 Mitigation

- Implemented prepared statements with parameter binding
- Used PDO with parameterized queries
- Applied input validation and sanitization
- Limited database user privileges

2.6.2 Cross-Site Scripting (XSS)

2.6.2.1 Vulnerability

Unsanitized user input rendered as HTML/JavaScript allows attackers to inject malicious scripts.

2.6.2.2 Mitigation

- Applied context-appropriate output encoding (`htmlspecialchars()`)
- Implemented Content Security Policy (CSP)
- Used HTTPOnly cookies to prevent JavaScript access
- Validated and sanitized all user inputs

2.6.3 CSRF (Cross-Site Request Forgery)

2.6.3.1 Vulnerability

Attackers can trick users into performing unwanted actions on authenticated sessions.

2.6.3.2 Mitigation

- Implemented unique CSRF tokens for forms
- Validated token and origin on form submissions
- Added SameSite cookie attributes
- Required confirmation for sensitive operations

2.6.4 Session Hijacking

2.6.4.1 Vulnerability

Attackers can steal or manipulate session identifiers to impersonate legitimate users.

2.6.4.2 Mitigation

- Implemented secure session handling with session regeneration
- Used HTTPS throughout the application
- Applied proper session timeout controls
- Implemented IP-based session validation for critical operations

2.7 SEO Optimization

Search Engine Optimization (SEO) is the practice of improving a website's visibility and ranking in search engine results pages (SERPs). When implemented effectively, SEO helps increase organic (non-paid) traffic to your website by making it more attractive to search engines like Google, Bing, and Yahoo.

Utilized strategies:

- Semantic HTML structure with appropriate heading hierarchy
- Server-side rendering for faster initial page loads

- Mobile-responsive design using Tailwind's responsive utilities
- Optimized meta tags (title, description, Open Graph)
- URL structure optimization with clean, descriptive URLs
- Image optimization with appropriate alt tags and lazy loading



Chapter III: Design



Chapter IV: Implementation



Chapter V: Installation



References