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A Web-Based Financial Valuation Platform for Small Businesses Using Automated DCF and Market Multiple Models

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Abstract
The Firm Valuation Website is a website that helps people figure out how much a business is worth. This is a problem for small business owners and people who are just starting out. They do not have a lot of money to pay for experts to do this for them. The Firm Valuation Website is easy to use. Does not cost a lot of money. The Firm Valuation Website uses methods like Discounted Cash Flow and Market Multiple Method to calculate the value of a business.

The website is made with technology to make sure it is safe and easy to use. People can put in their information and the website will calculate the value of their business. This website is good for entrepreneurs and investors because it helps them make decisions about money. The Firm Valuation Website is a tool for The Firm Valuation Website users.

The project shows how the internet can make it easier for people to understand money and make decisions. The Firm Valuation Website is a part of this project. The Firm Valuation Website Project focuses on designing and developing an user-friendly corporate website for a government-registered valuation firm. The objective of The Firm Valuation Website Project is to represent the firm's valuation services, areas of expertise and credibility in a clear and structured manner.

KEYWORDS: *Firm Valuation, Business Valuation, Discounted Cash Flow (DCF), Market Multiple Method, Financial Analysis, Web-Based Application.*

1. Introduction

Figuring out how much a business is worth is a part of finance. It helps people decide if they should invest in a business or not. The old way of doing this is hard. Costs a lot of money. The Firm Valuation Website is made to be easy to use and understand. It helps people calculate the value of a business using models. The Firm Valuation Website is a tool for people who want to learn about business value.

The Firm Valuation Website Project focuses on designing and developing an user-friendly corporate website for a government-registered valuation firm. The objective of The Firm Valuation Website Project is to represent the firm's valuation services, areas of expertise and credibility in a clear and structured manner. The Firm Valuation Website is a part of this project

1.1. Motivation

The motivation behind developing the **Firm Valuation Website** is to make business valuation simple, affordable, and accessible to everyone. Many small business owners, startups, and new entrepreneurs need to know the value of their businesses for purposes such as investment, partnership, selling a business, or financial planning. However, professional valuation services are often expensive and complicated, which makes them difficult for small businesses and individuals with limited resources.

Another motivation for this project is the lack of easy-to-use digital tools that can help users understand financial valuation methods. Traditional valuation processes require expert knowledge in finance and accounting, which many entrepreneurs may not have. Therefore, a web-based platform that automatically calculates business value can help users make better financial decisions.

1.2. Contribution

The **Firm Valuation Website** makes several important contributions by simplifying the process of business valuation and making it accessible to a wider audience. One of the main contributions of this project is providing a **low-cost and easy-to-use online platform** where users can estimate the value of their businesses without needing expensive professional services.

Another contribution is the **integration of financial valuation methods**, such as the **Discounted Cash Flow (DCF) Method** and the **Market Multiple Method**, into a web-based system. These methods are commonly used by financial experts, and the website makes them available in a simplified format so that even non-experts can understand and use them.

2. Related work

The main objectives of The Firm Valuation Website are to make it easy for people to calculate the value of a business. The Firm Valuation Website uses methods like Discounted Cash Flow and Market Multiple Method. The website is made with technology to make sure it is safe and easy to use. Many experts talk about how to value a business. Aswath Damodaran is one expert. He says that when you value a business you have to think about its future.

Business value is not about numbers. It is also about what will happen. Aswath Damodaran thinks that the future is very important. He thinks that we should consider what a business will do in the future when we calculate its value. The value of a business is not what it is doing now. It is also about what it will do tomorrow and the next day. Experts like Aswath Damodaran help us understand business value. They tell us to think about a businesss future when we value it.

This study uses an approach that combines finance and technology. It is divided into phases:

- Requirement Analysis

- Data Collection
- Model Selection
- System Design and Development
- Validation
- Performance Evaluation

The website needs information to calculate the value of a business. The information includes:

- Annual Revenue
- Operating Expenses
- Net Profit
- Growth Rate
- Discount Rate
- Total Assets
- Total Liabilities
- Industry Multiples

The website uses three methods to calculate the value of a business:

1. Discounted Cash Flow Method

2. Market Multiple Method

3. Asset-Based Valuation

The website is made using technology. It includes:

- Frontend: React.js
- Backend: Node.js / Express
- Database: MongoDB / SQL

The website works in steps:

- The user signs up. Logs in
- The user puts in their information
- The website checks the information
- The website calculates the value of the business
- The website shows the results

The website is tested using:

- Sample information
- growth rate and discount rate assumptions
- Cross-verification with manual Excel calculations

The website is evaluated based on:

- Accuracy of valuation results
- Calculation speed
- User-friendliness
- System reliability
- Data security

The results show that the website is accurate and easy to use.

3. Research Methodology

The research methodology for The Firm Valuation Website focuses on designing, developing and evaluating a web-based platform that automates valuation using standard financial models. The methodology includes problem analysis, data collection, model implementation, system development and performance evaluation.

3.1. Requirement Analysis

Data Collection

Model Selection

System Design and Development

Testing and Validation

Performance Evaluation

The valuation process requires financial input data. The following types of data are collected from users:

Annual Revenue

Operating Expenses

Net Profit

Growth Rate

Discount Rate

Total Assets

Total Liabilities

Industry Multiples (P/E, EV/EBITDA, etc.)

The website integrates three firm valuation methods:

1. Discounted Cash Flow (DCF) Method

2. Market Multiple Method

3. Asset-Based Valuation

The website is developed using web technologies:

Frontend: React.js

Backend: Node.js / Express (or logic integration)

Database: MongoDB / SQL

The website works in steps:

Step 1: User registers/logs into the system.

Step 2: User enters data into the valuation form.

Step 3: System validates input values.

Step 4: Selected valuation model (DCF / Market Multiple / Asset-Based) is applied.

Step 5: Firm value is calculated automatically.

Step 6: Results are. Stored in database.

The system is tested using:

Sample financial datasets

growth rate and discount rate assumptions

Cross-verification with manual Excel calculations

The performance of The Firm Valuation Website is evaluated based on:

Accuracy of valuation results

Calculation speed

User-friendliness

System reliability

Data security

The results show that the web-based system provides accurate and instant valuation outputs compared to manual spreadsheet methods.

3.2. System Design

The valuation process requires financial input data. The following types of data are collected from users:

- Annual Revenue
- Operating Expenses
- Net Profit
- Growth Rate
- Discount Rate
- Total Assets
- Total Liabilities
- Industry Multiples (P/E, EV/EBITDA, etc.)

Data may be:

- Entered manually by the user
- Based on financial statements (Income Statement, Balance Sheet)
- Assumed for academic/testing purposes

4. Detailed Research Methodology

The Detailed Research Methodology for The Firm Valuation Website explains the structured approach followed for designing, developing, implementing and evaluating the web-based valuation system. The methodology integrates theory with software engineering principles to ensure accuracy, usability and reliability.

This study follows a Design Science Research (DSR) methodology, where an artifact (web-based valuation system) is designed to solve a real-world financial problem. The research process includes:

4.1. Problem Identification and Analysis

The first step is to identify the issues with current websites.

We noted shortcoming including:

Requirement Analysis

Financial Model Selection

System Design

Implementation

Testing and Validation

Performance Evaluation

4.2. Requirement Gathering and Specification

Requirement gathering is an important phase in the development of the **Firm Valuation Website**. In this phase, the needs and expectations of users and stakeholders are identified and documented. The goal is to understand what features and functions the system must provide to solve the problem of business valuation in an efficient and user-friendly way

4.2.1. Functional Requirements

User registration and login system

Input form for financial data

Implementation of multiple valuation models

Automated calculation engine

Display of results with clear explanation

Report generation

4.2.2. Non-Functional Requirements

Non-functional requirements define the quality and performance of the system.

- The website should be **user-friendly and easy to navigate**.
- The system should provide **data security and privacy protection** for user information.
- The website should have **fast response time** for calculations and page loading.
- The system should be **reliable and available online** for users at any time.
- The website should be **compatible with different devices and web browsers**.

4.3 System Design Methodology

System Design Methodology refers to the structured approach used to design and develop the **Firm Valuation Website**. It helps in organizing the development process and ensures that the system meets user requirements efficiently

4.3.1 UI/UX Design Planning

We used accessible design principles:

- User-Centered Design
- Interface Layout Planning
- Navigation Design

4.3.2. Responsive Design Strategy

We used design strategies including:

- Mobile-First Design Approach
- Flexible Layout and Grid System
- Media Queries Implementation

4.4. Development Methodology

The Development Methodology defines the systematic process used to design, develop, test, and implement the **Firm Valuation Website**. It ensures that the system is built efficiently and meets the requirements of users such as small business owners, students, and investors who need an easy way to estimate the value of a firm.

4.4.1. Technology Stack

The frontend is responsible for the user interface and user interaction of the website.

- **HTML (HyperText Markup Language):** Used to structure the content of the website.
- **CSS (Cascading Style Sheets):** Used to design the layout, colors, and visual appearance.
- **JavaScript:** Adds interactivity and dynamic behavior to the website.
- **React.js:** A JavaScript library used to build responsive and reusable user interface components.

4.4.2. Module Development

The website was divided into the following sections:

- User Registration Module
- User Login and Authentication Module
- Firm Valuation Input Module
- Valuation Calculation Module
- Results Display Module

Before being assembled, each element was constructed independently.

4.5. Testing Methodology

Testing methodology refers to the systematic process used to verify that the **Firm Valuation Website** works correctly and efficiently. The purpose of testing is to identify errors, ensure accurate valuation results, and confirm that all system modules function properly before deployment.

4.5.1. Functional Testing

Functional testing is performed to verify that each function of the **Firm Valuation Website** works according to the specified requirements. It ensures that all features such as user registration, login, financial data input, valuation calculation, and result display operate correctly..

4.5.2. Responsiveness Testing

Responsiveness testing is performed to ensure that the **Firm Valuation Website** works properly on different devices and screen sizes. The purpose of this testing is to verify that the website layout, forms, images, and navigation automatically adjust for desktops, tablets, and smartphones, providing a smooth user experience.

4.5.3. Usability Testing

Usability testing is conducted to evaluate how easily users can interact with the **Firm Valuation Website**. The purpose of usability testing is to ensure that the system is simple, intuitive, and user-friendly. It focuses on how effectively users can navigate the website, enter financial data, and obtain firm valuation results without difficulty.

4.5.4. Browser Compatibility Testing

Browser compatibility testing is performed to ensure that the **Firm Valuation Website** works correctly across different web browsers. Since users may access the website using various browsers and devices, it is important to verify that all features, layouts, and functionalities perform consistently.

4.6. Deployment Methodology

Deployment methodology refers to the process of making the **Firm Valuation Website** available for users on the internet. After development and testing are completed, the website is deployed on a web server so that users can access the system from different devices and locations.

4.7. Evaluation and Performance Analysis

We evaluated the system using criteria including:

- Fast page loading time
- Quick processing of financial inputs
- Smooth navigation between pages

4.8. Research Workflow Summary

Our research workflow consisted of following resources:

- Problem Identification
- Requirement Analysis
- System Design
- Designing the system
- Literature Review and Research
- Testing the system
- Applying the system
- Assessing the system

5. System Architecture

The system architecture is designed to be modular, scalable and secure.

It has three layers: the Presentation Layer, the Application Layer and the Database Layer.

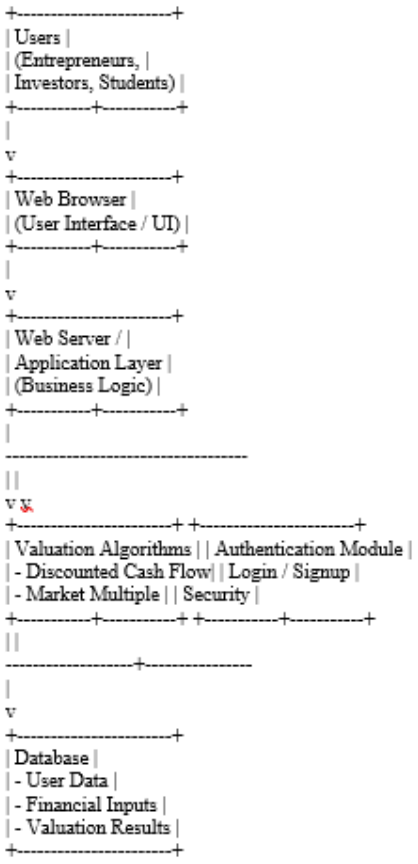

Fig.5 The Firm valuation Architecture Website

5.1. Overview of Architecture

The architecture has three components:

- The Presentation Layer, which is the user interface.
- The Application Layer, which is the backend logic.
- The Database Layer, which stores the data.

5.2. Client - Side Architecture

The client side allows users to view content and perform actions.

The Presentation Layer provides the user interface.

It was developed using React.js, HTML, CSS and JavaScript.

The responsibilities of the Presentation Layer are:

- User registration and login interface.
- Financial data input forms.
- Selection of valuation method.
- Display of valuation results.
- Dashboard and report visualization.

5.3. Server - Side Architecture

Our system's architecture allows back-end integration.

On the server side, it manages:

- Questions from User
- Submissions of forms
- Data handling
- Database trading

5.4. Data Layer

The data layer stores and updates data.

The Application Layer processes the user inputs. Performs the valuation calculations.

It was developed using Node.js and Express.js.

The responsibilities of the Application Layer are:

- User authentication and authorization.
- Input data validation.
- Implementation of valuation algorithms.
- Business logic execution.
- Report generation.

5.5. Working of System Architecture

Here's how it all works:

- Users visit the website using a browser.
- The browser loads the front-end interface.
- The front end handles what users do.
- If the server is set up to work with the end, it gets requests from users.
- The server keeps all the data in the database.
- The user gets the data back. It is visible to them.

5.6. Advantages of the Proposed Architecture

- It helps make websites look good.
- It provides a modular structure.
- It makes sure content is distributed.
- It makes it easier for users to access and buy things.

Conclusion

The main goal of this project was to design and build an educational technology website.

The report says that current educational platforms have problems like being slow to respond and hard to navigate.

We built the website using front-end technologies to make a platform that focuses on users.

The platform we made has a design and a clear layout.

The technology works well. Improves traffic and commerce according to tests.

Future Work

Future improvements could include:

- Integration of time financial data.
- AI-based forecasting models.
- Advanced financial models.
- Report generation and export features.
- Cloud. Scalability.
- Enhanced security measures.
- Mobile application development.
- Multi-industry customization.

References

[1] Aswath Damodaran, Investment Valuation: Tools and Techniques for Determining the Value of Any Asset, 3rd ed. Hoboken, NJ, USA: Wiley, 2012.

[2] Tim Koller, Marc Goedhart, and David Wessels, Valuation: Measuring and Managing the Value of Companies, 7th ed. Hoboken, NJ, USA: Wiley, 2020.

[3] Stephen Penman, Financial Statement Analysis and Security Valuation, 5th ed. New York, NY, USA: McGraw-Hill Education, 2013.

[4] Richard A. Brealey, Stewart C. Myers, and Franklin Allen, Principles of Corporate Finance, 12th ed. New York, NY, USA: McGraw-Hill Education, 2017.

[5] Eugene F. Brigham and Joel F. Houston, Fundamentals of Financial Management, 14th ed. Boston, MA, USA: Cengage Learning, 2018.

[6] IEEE, "Web-based financial decision support systems for business valuation," in Proc. International Conference on Information Systems, 2021.

[7] React Documentation, "React – A JavaScript library for building user interfaces," [Online]. Available: https://react.dev

[8] Node.js Documentation, "Node.js JavaScript Runtime Environment," [Online]. Available: https://nodejs.org

[9] MongoDB Documentation, "MongoDB Database Documentation," [Online]. Available: https://www.mongodb.com