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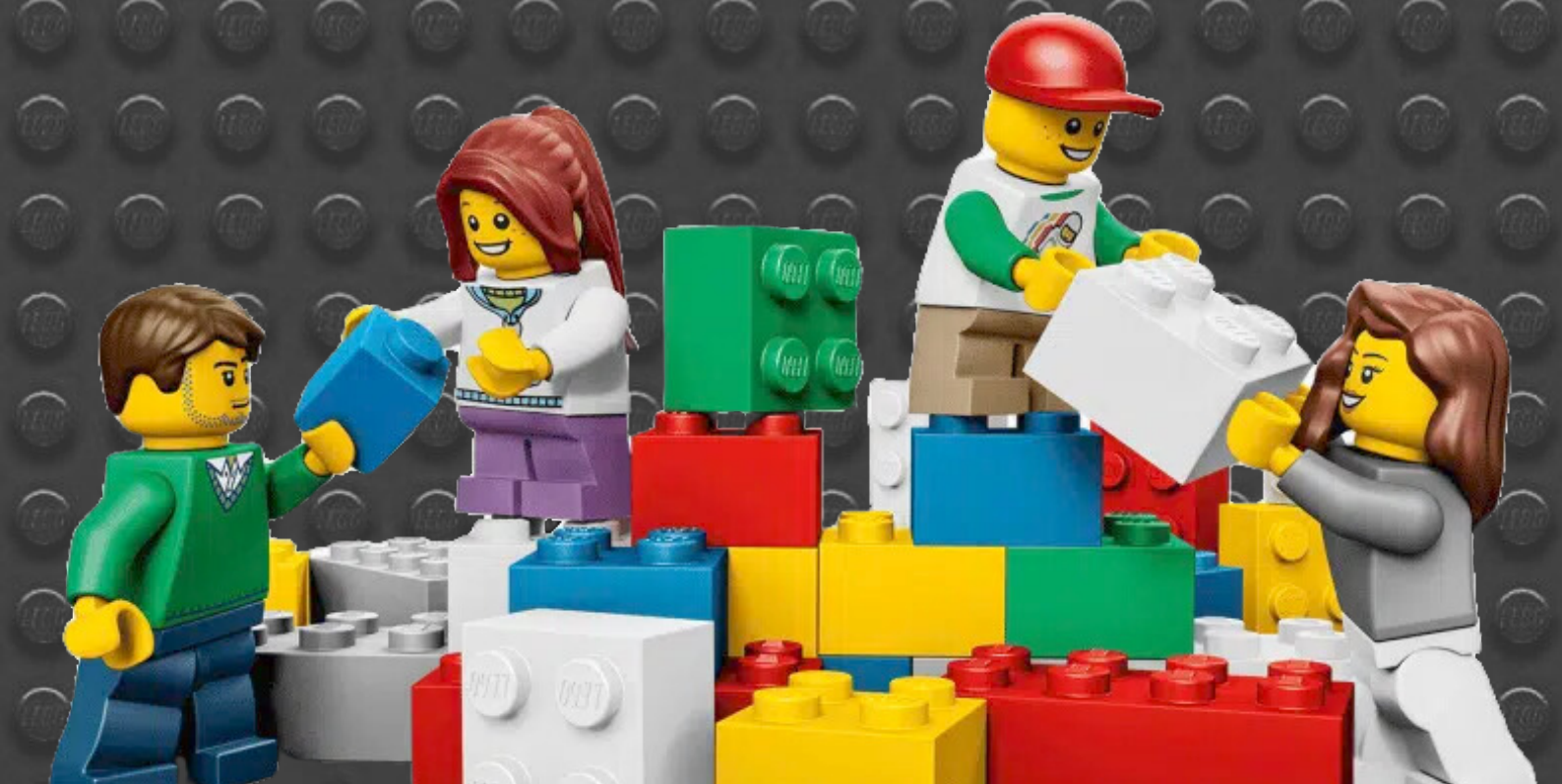
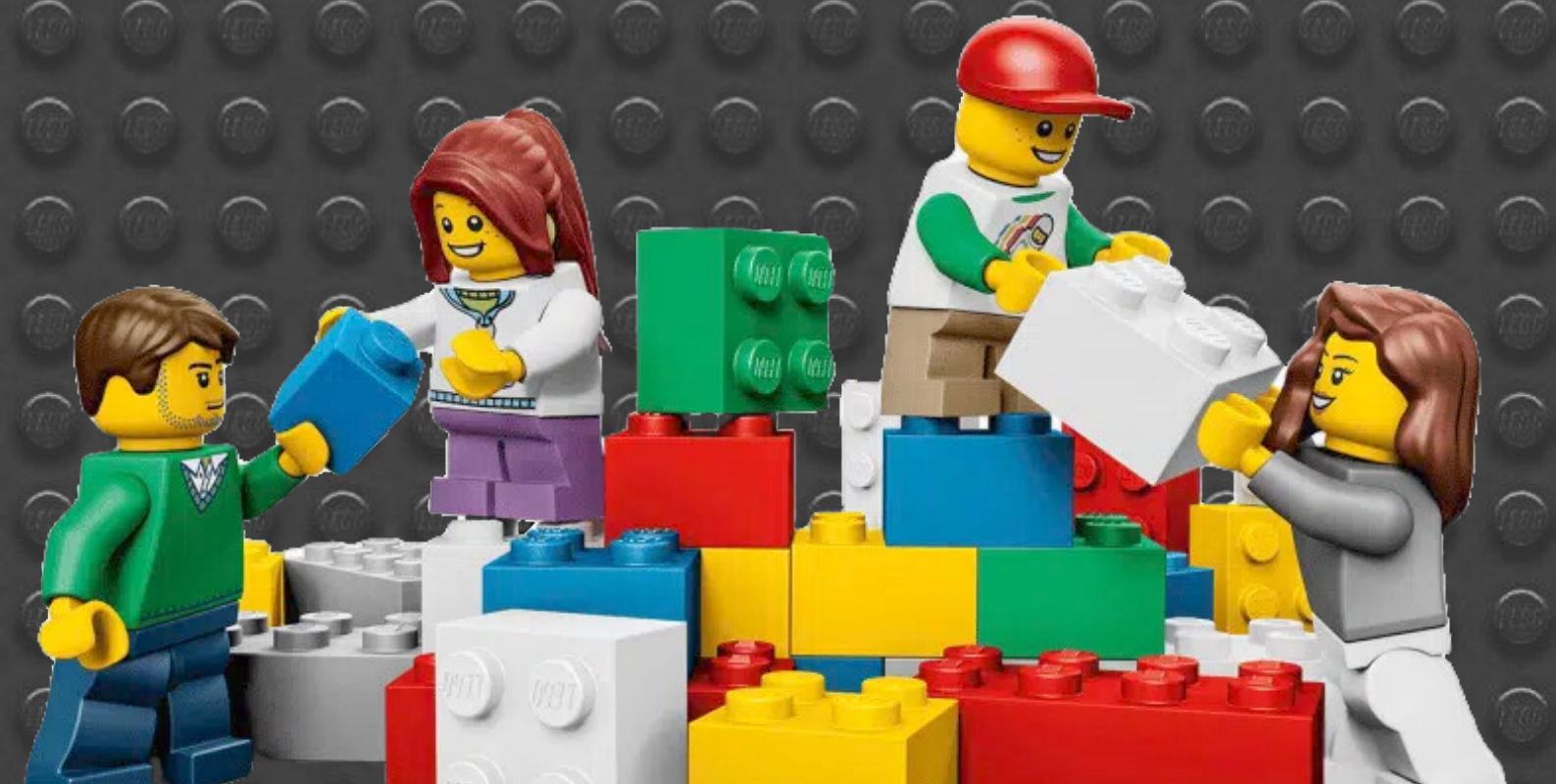
PROBLEM STATEMENTS



SYN3RGY

WEB/APP



SYN3RGY

PROBLEM STATEMENT 1

Efficient Document Management for Construction Teams

The construction industry heavily relies on physical paperwork and digital files for project documentation, plans and other crucial information. Unfortunately, managing these documents often translates to a chaotic landscape of folders and files scattered across various devices and cloud storage services. This fragmented system leads to inefficiencies, lost time, and difficulty in collaborating across teams.

Problem:

Construction professionals lack a centralized, user-friendly solution for managing their diverse file ecosystem. Navigating through numerous folders and searching for specific files is time-consuming and frustrating. Additionally, collaborating on documents is hampered by the absence of features for real-time interaction, annotation, and version comparison. Hence, develop a system designed specifically for construction/civil professionals to empower efficient and collaborative file management.

Features:

- **Intuitive file organization:** A clear and accessible sidebar showcasing all project folders with nested subfolders for easy navigation.
- **Seamless file access:** Quick retrieval of relevant documents upon clicking a folder, displaying all contained files in a user-friendly format.
- **Files segmentation:** Segment the files in the folder based on their types, distinguishing between PDFs, DOCs, images, etc.
- **Active file view:** A dedicated section highlighting currently opened files for immediate reference and easy switching between projects.
- **Interactive tools:** Embedded annotation features like drawing, highlighting, and text commenting directly on files for clear communication and feedback.

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PROBLEM STATEMENT 1

- **Version control:** A robust system for version comparison, allowing users to overlay or side-by-side compare new files with previous versions to identify changes and maintain version history.
- **Cross-platform accessibility:** Web and mobile app versions for accessing and managing files from any device, anytime, anywhere.

Bonus Points:

Drawings: Segregate into separate folders for each type of drawing, which can be in PDF or DWG format: Architectural, Structural, Hydraulic, Electrical, Civil, etc.

Documents: Organize these files by their specific category, which can be in PDF, Word, Excel formats: Report, Specification, Approvals, Schedules, Scope of Works, Subcontract / Contract, etc.

Images: Sort these files according to their category: 3D Render, Site Photos, Inspection Photos, etc.

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PROBLEM STATEMENT 2

Route planning system for EVs using Google Maps.

The rise of electric vehicles (EVs) has necessitated the development of efficient route planning systems tailored to their unique requirements. Unlike conventional vehicles, EVs must factor in variables such as battery life and charging station locations when charting a course. This demand stems from the growing adoption of environmentally friendly transportation alternatives and the need to address range anxiety among EV drivers.

PROBLEM:

The challenge lies in devising a route planning system for EVs that integrates seamlessly with any API of your choice, accommodating essential inputs such as current battery percentage, start and end locations, EV range, and battery capacity. The system must then furnish outputs comprising charging station locations, the number of necessary charging stops, and an optimal route considering these factors. Furthermore, it should harness data to provide details on charging station connector types, capacities, availability, and operational status.

To address this challenge, a web-based application utilizing React for the frontend and Node.js for the backend, with MySQL as the database, has to be made. Upon receiving user inputs, the system has to process the data to determine charging station locations along the route, the number of required stops, and the optimal itinerary. The frontend has to provide a user-friendly interface requiring minimal input and presenting outputs clearly and comprehensively. Additionally, the system has to handle scenarios where no suitable charging stations are available or where the destination remains out of reach even with charging.

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PROBLEM STATEMENT 2

FEATURES:

1. User-friendly Interface: The frontend will offer an intuitive interface, minimizing user input requirements.
2. API Integration: Utilize an API for route planning and visualization**.**
3. Input Handling: Collect essential inputs such as current battery percentage, start and end locations, EV range, and battery capacity.
4. Output Presentation: Clearly present outputs including charging station locations, number of stops, and optimal route.
5. Charging Station Details: Retrieve and display charging station information such as connector types, capacities, availability, and operational status.
6. Database Management: Utilize MySQL database for storing and retrieving charging station details.
7. Handling Edge Cases: Address scenarios where suitable charging stations are unavailable or the destination remains out of range.

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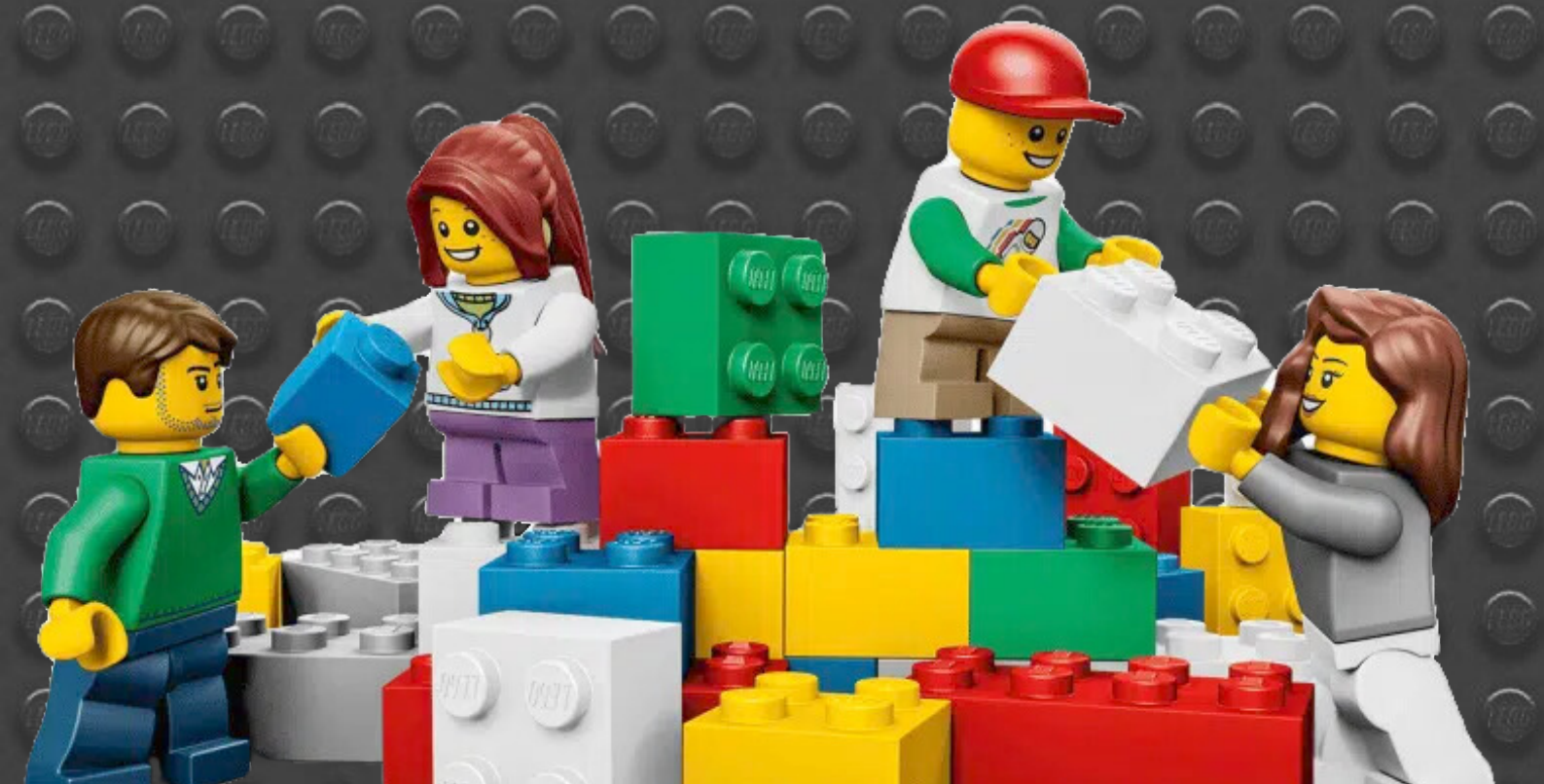

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PROBLEM STATEMENT 3

Automating File Organization & Information Extraction in Construction Project Packages

The construction industry relies heavily on paper and digital documents for project information. However, this information is often scattered, unorganized, and lacks standardized naming conventions. This makes it difficult and time-consuming to find specific documents, hindering collaboration, management, and overall project efficiency.

Problem:

Current methods for construction document management are manual and inefficient, leading to:

- Disorganized files: Documents are stored in folders with inconsistent naming conventions, making them difficult to locate.
- Time wasted searching: Project teams spend excessive time searching for specific documents, impacting productivity and deadlines.
- Limited collaboration: Inconsistent file organization hinders effective communication and information sharing across teams.
- Error-prone manual processes: Manually labelling and organizing documents is prone to errors and inconsistencies.

Hence, develop an AI based solution to efficiently label and organize construction files, ensuring quick access.

Features:

1. **Automated classification and Organisation**- Develop an AI/ML system to process and classify files from construction projects, identifying types and relevant details, and reorganizing them into a standardized, user-friendly format. For a drawing extract drawing title, drawing number and revision. For a document extract name and understand the category from cover page.

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PROBLEM STATEMENT 3

2.Manual Review Interface- Develop a user interface for manual verification and edits of AI-classified file data. Enable users to correct file details and classifications directly. Allow manual information extraction from documents by drawing on them. Streamline user corrections to improve data accuracy and organization.

3.Data Extraction and Labelling- Extract key information from files, particularly from plans, which includes identifying and labelling dynamic content such as drawing titles, numbers, revisions, and statuses, in addition to static information like project name, number, address, client, and consultant across all sheets of a plan type.

Example-
Plans: Extract and label dynamic content such as drawing titles, numbers, revisions, and statuses. Also, identify static information like project name, number, address, client, and consultant across all sheets of a particular plan type. Refer to the markup on a plan.

Documents (Other than plans): On the first page, identify and label the document's name and its category. For example:
· Acoustic Report: "Acoustic" is the document name, and "Report" is its category.
· Internal Finishes Specification: "Internal Finishes" is the name, and "Specification" is the category.
· Hardware Schedule: "Hardware" is the name, and "Schedule" is the category.
· Scope of Works: This would be under the "Scope of Works" category.
· Contract: This would fall under the "Contract" category.
Bonus Point: A feature that enhances the navigation between different but related construction documents, specifically between floor plans and their detailed section drawings. By recognizing section flags on floor plans, the AI can automatically link these to the corresponding section drawings, enabling users to navigate between related documents seamlessly.

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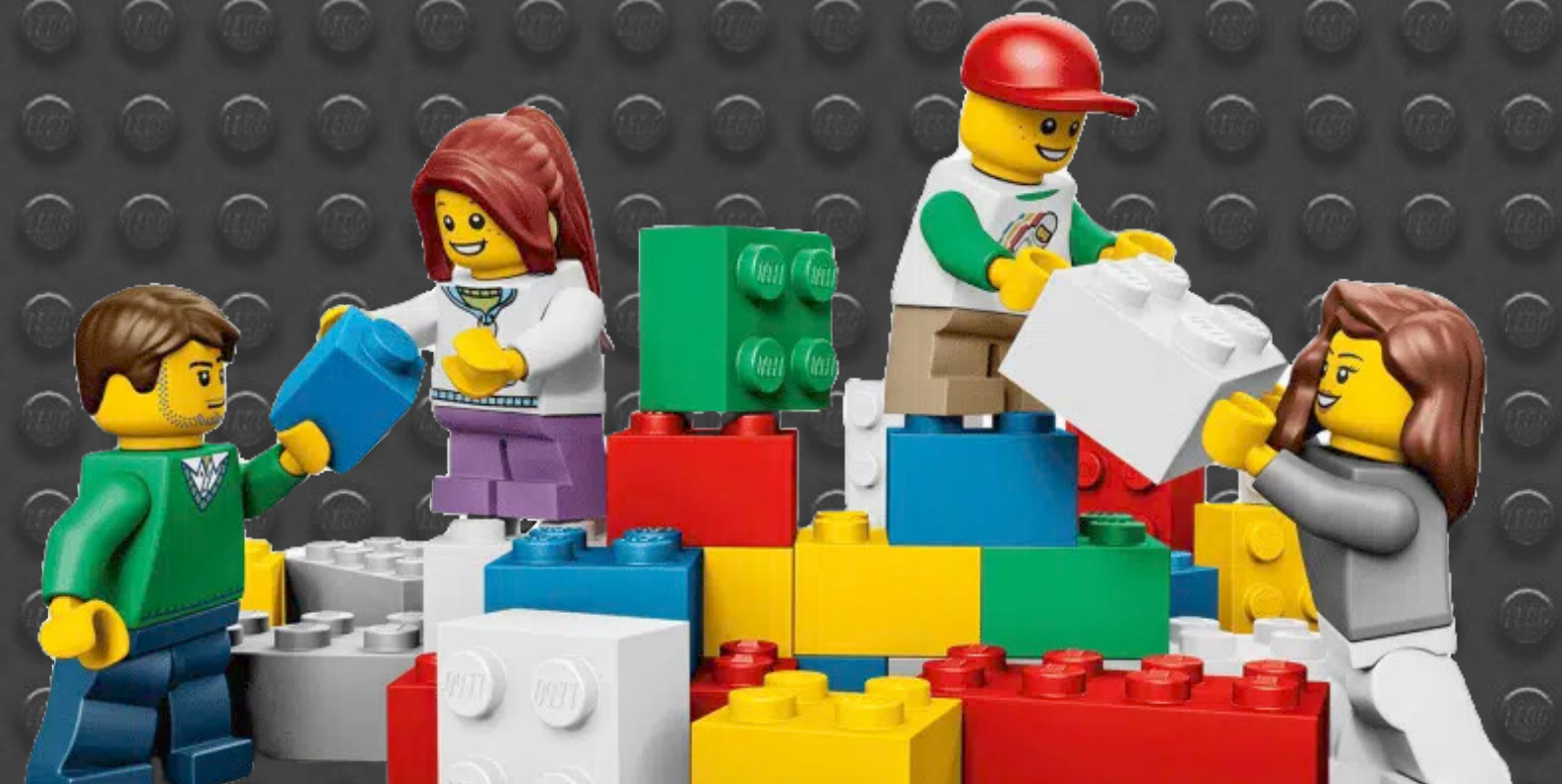
GEN AI



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PROBLEM STATEMENT 4

AI-Driven Suicide Detection and Mental Health Monitoring

Problem Statement:

• Suicide is a global public health issue, with millions of lives lost each year. One of the biggest challenges in suicide prevention is identifying individuals who may be at risk before its too late. Traditional methods of mental health assessment often rely on subjective evaluations and self-reporting, making it difficult to intervene effectively.

• Leveraging Artificial Intelligence (AI) and Machine Learning (ML) presents an opportunity to develop proactive solutions for suicide detection and mental health monitoring.

Description:

• In this hackathon, participants will tackle the challenge of developing an AI-driven solution for suicide detection and mental health monitoring. The objective is to create a system that can analyze various data sources to identify individuals who may be at risk of suicide or experiencing deteriorating mental health, thereby enabling timely intervention and support.

(Dataset will be provided)

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PROBLEM STATEMENT 5

Transforming Physical Billboard ADs to Interactive Digital AD experiences on Mobile

Problem Statement:

• In the evolving landscape of advertising, the challenge lies in seamlessly transitioning from physical billboards to digital experiences on mobile devices. While QR codes offer a means to connect users to digital content, the challenge lies in delivering a seamless and engaging experience that retains the essence of the original advertisement while adapting to the limitations and opportunities of mobile screens. Moreover, enabling user interaction with the advertisement on their mobile devices adds another layer of complexity to this integration.

Description:

• In this hackathon, participants will address the challenge of seamlessly transitioning physical billboard advertisements to mobile devices while maintaining user engagement and interactivity. The objective is to develop a solution that allows users to scan QR codes on billboards to receive the corresponding advertisement on their mobile devices, ensuring optimal presentation and interaction capabilities.

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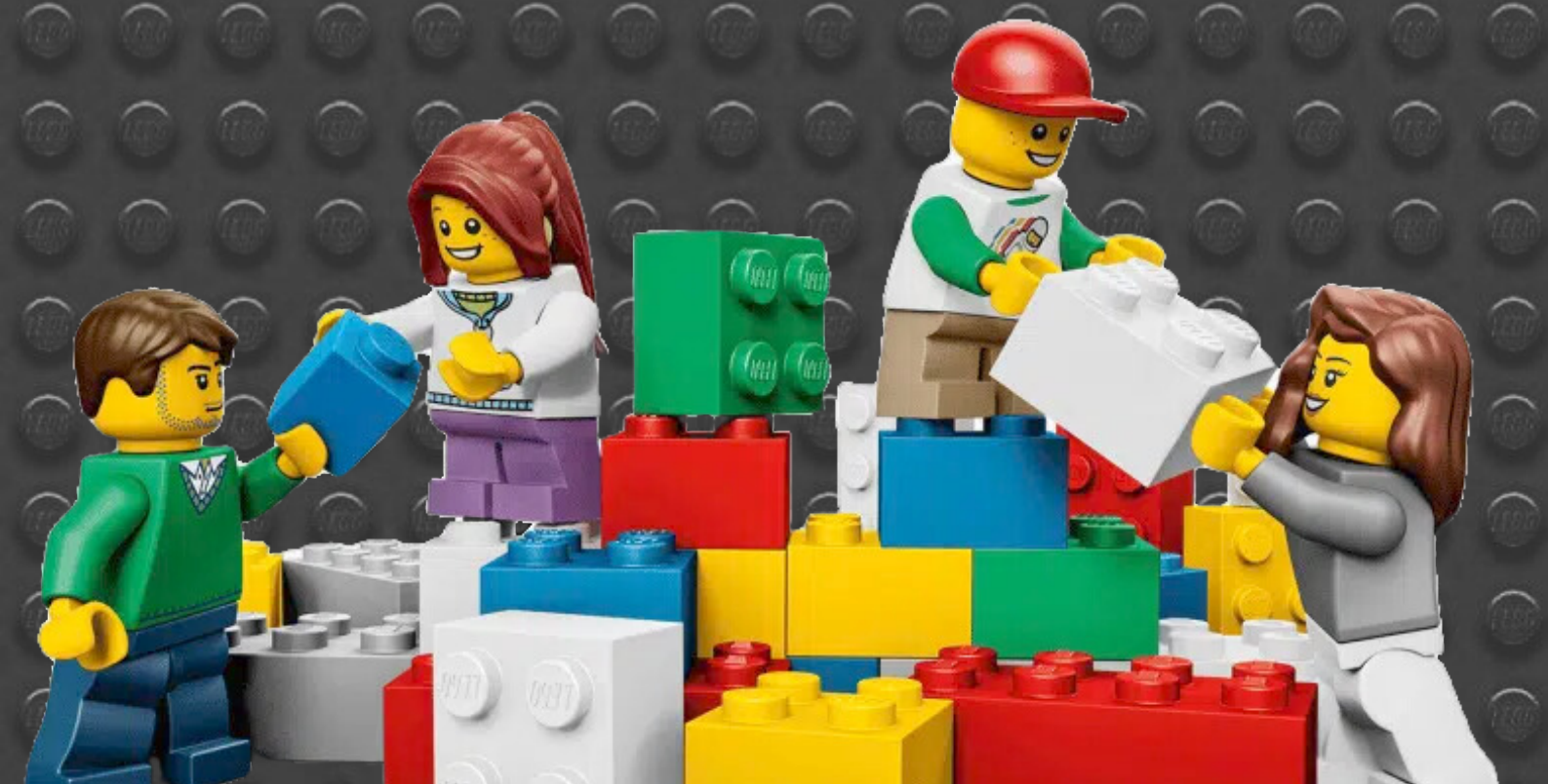
WEB 3



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PROBLEM STATEMENT 6

Fund Trail Analysis Tool for centralized and Decentralized Exchanges

Challenge:

Lack of transparency in cryptocurrency transactions: Tracing the movement of funds across centralized and decentralized exchanges (CEXs and DEXs) is complex and time-consuming due to:

Limited visibility: CEXs often lack transparency regarding internal transfers and wallet addresses, while DEX transactions occur on public blockchains but require extensive data analysis for meaningful insights. Manual investigation: Tracing funds across multiple platforms and blockchains manually is tedious, error-prone, and inefficient.

Compliance challenges: Regulatory bodies and financial institutions require robust tools for investigating suspicious activity and ensuring compliance with anti-money laundering (AML) and know-your-customer (KYC) regulations.

Solution:

Develop a comprehensive Fund Trail Analysis Tool that:

Aggregates data from CEXs and DEXs: Integrate with various APIs and blockchain explorers to gather comprehensive transaction data from both centralized and decentralized exchanges.

Automates fund tracing: Utilize advanced algorithms and data analysis techniques to automatically track the movement of funds across different platforms and blockchains, identifying the origin, destination, and intermediate steps of each transaction.

Visualize fund flow: Present complex transaction data in an intuitive and user-friendly format, such as interactive graphs and charts, to facilitate clear visualization and analysis of fund movement patterns.

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PROBLEM STATEMENT 6

Identify suspicious activity: Implement anomaly detection and risk scoring mechanisms to flag potentially suspicious transactions based on predefined criteria and historical data.

Generate compliance reports: Provide comprehensive reports that comply with regulatory requirements, enabling investigators and financial institutions to efficiently fulfill their AML and KYC obligations.

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PROBLEM STATEMENT 7

Identity Verification for KYC Processes in Financial Institutions using BlockChain

Scenario:
A financial institution, let's call it "SecureBank," is looking to streamline its KYC processes while
ensuring the security and privacy of customer data. They decide to implement a blockchain-based
identity verification system to enhance efficiency, reduce fraud, and comply with regulatory
requirements.
1. User Registration:
Alice, a new customer, decides to open an account with SecureBank. She visits the bank's website or
mobile app and initiates the registration process. During registration, Alice provides her basic
personal information such as name, address, date of birth, and contact details.
2. Identity Verification:
Instead of the traditional manual verification process, SecureBank integrates a blockchain-based
identity verification system into its platform. Alice's provided information is encrypted and securely
stored on the blockchain. The system then cross-references this information with trusted data
sources such as government databases, credit bureaus, and utility companies.

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PROBLEM STATEMENT 7

3. Smart Contract Execution:
Once the verification process is complete, a smart contract is deployed on the blockchain to manage
Alice's KYC data. This smart contract contains rules and conditions agreed upon by SecureBank and
regulatory authorities, ensuring compliance with KYC regulations.
4. Verification Results:
After analyzing the data, the blockchain-based system generates a verification report indicating the
accuracy and reliability of Alice's information. This report is cryptographically signed and
timestamped, providing an immutable record of the verification process.
5. Access Control:
SecureBank grants access to Alice's verified KYC data only to authorized parties, such as compliance
officers and regulators. Access permissions are managed through cryptographic keys and smart
contracts, ensuring data privacy and security.
6. Ongoing Monitoring:
The blockchain-based system continuously monitors Alice's account for any suspicious activities or
changes in her profile. Any anomalies detected trigger alerts, prompting further investigation by
SecureBank's compliance team.

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PROBLEM STATEMENT 7

Benefits:
- Enhanced Security: By leveraging blockchain technology, SecureBank ensures that Alice's sensitive
KYC data is encrypted, tamper-proof, and accessible only to authorized parties.
- Efficiency Gains: The automated verification process reduces the time and resources required for
KYC checks, enabling SecureBank to onboard new customers more quickly.
- Regulatory Compliance: SecureBank demonstrates compliance with KYC regulations by maintaining
a transparent and auditable record of identity verification activities on the blockchain.
- Improved Customer Experience: Alice experiences a seamless onboarding process with minimal
paperwork and delays, enhancing her overall satisfaction with SecureBank's services.

Overall, implementing a blockchain-based identity verification system for KYC processes enables
SecureBank to strengthen security, improve efficiency, and maintain regulatory compliance while
delivering a better experience for its customers.

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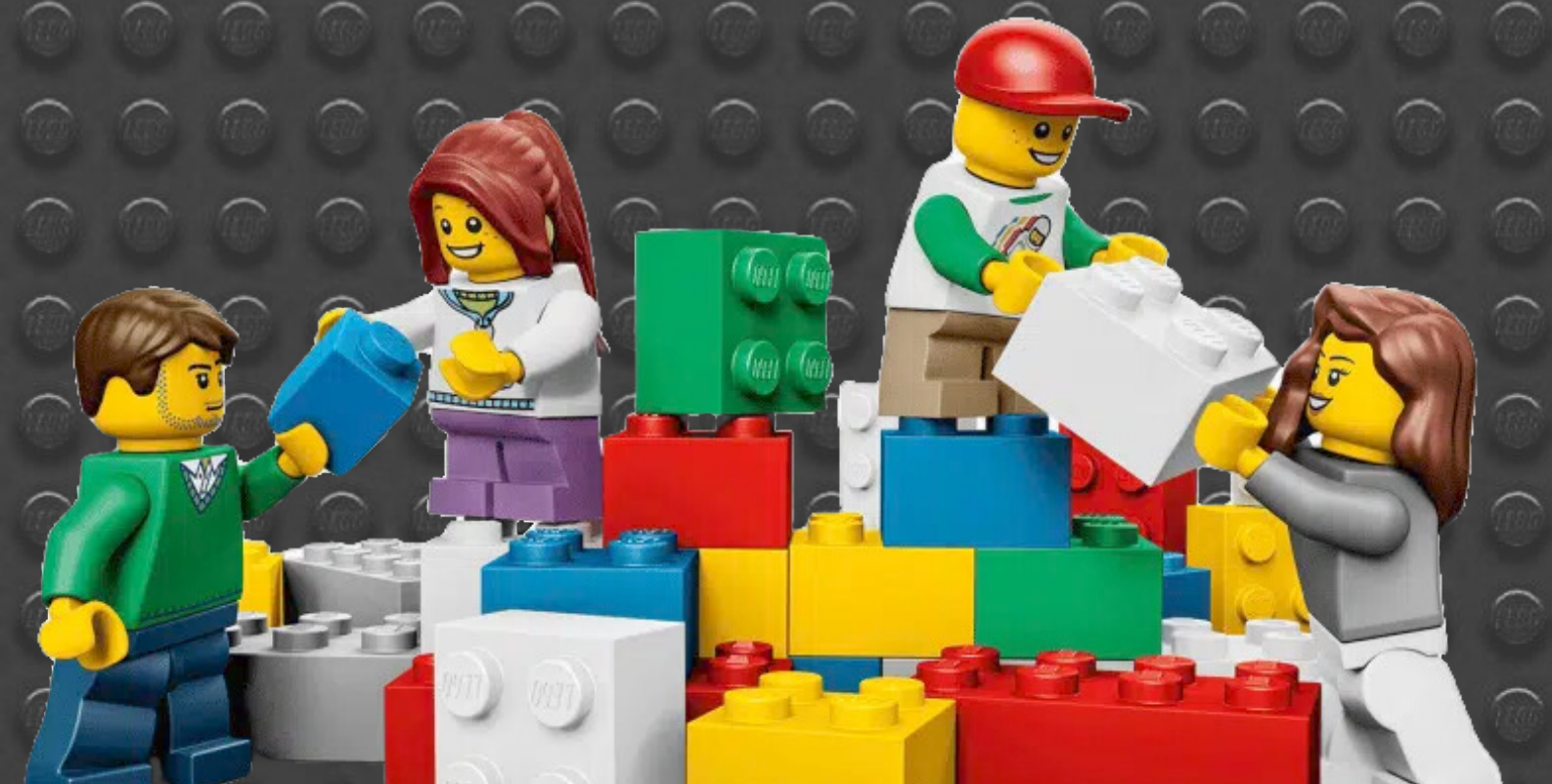
CYBERSECURITY



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PROBLEM STATEMENT 8

Vulnerability assesment and penetration testing automation tool

Design and build an advanced VAPT tool capable of detecting, exploiting, and mitigating security vulnerabilities in web applications and APIs. The tool should encompass sophisticated reconnaissance techniques, include support for authentication-based testing, and provide detailed reports with proof-of-concepts & remediation guidelines. Additionally, participants are encouraged to devise evasion techniques to avoid detection by defensive measures.

Key Requirements:

1. Automated Vulnerability Detection: Develop algorithms to automatically identify a wide range of security vulnerabilities, including SQL injection, Cross-Site Scripting (XSS), Cross-Site Request Forgery (CSRF), and from the OWASP Top 10 list, etc.
2. API Vulnerability Assessment: Extend the tool's capabilities to assess the security of APIs, identifying vulnerabilities such as improper authentication, data exposure, insecure endpoints, BOLA, BFLA, injection, etc.
3. Sophisticated Reconnaissance: Implement advanced reconnaissance techniques, including active information gathering to gather intelligence about the target web applications and potential attack vectors.
4. Credential-Based Testing: Introduce functionality requiring participants to provide credentials for web applications with authentication mechanisms. The tool should simulate authenticated testing scenarios to uncover vulnerabilities that may be hidden behind login screens.

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PROBLEM STATEMENT 8

Brownie Points (Bonus Requirements):

1. Evasion Techniques: Develop evasion techniques to avoid detection by intrusion detection and prevention systems (IDPS) or other security controls deployed by defenders (blue team) during penetration testing.
2. Vulnerability Coverage: The more vulnerabilities identified and exploited, the higher the bonus points.
3. Compliance Assistance: Explore features that aim to support organizations in upholding compliance with pertinent standards such as HIPAA and ISO27001. Provide features that offer insights into compliance requirements and facilitate risk management.