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THE GRADS EXPO 2025

School of **ICT**

ICT Students Projects

Leading the way:
A message from the CEO

Welcome to the ICT Graduates Exhibition 2025. Today, we celebrate more than the accomplishments of our students—we celebrate the role Bahrain Polytechnic plays in shaping a generation ready to lead in a world defined by change, complexity, and opportunity.

This exhibition is a powerful reflection of our mission: to produce work-ready graduates who think critically, act responsibly, and innovate with purpose. What you see today are the outcomes of a learning journey rooted in applied knowledge, industry collaboration, and real-world problem-solving. As Bahrain continues its transition toward a diversified, knowledge-based economy, the relevance of events like this cannot be overstated. The future will be built by individuals who can bridge the gap between academic learning and societal need—individuals like the graduates we honor today. The role of institutions like Bahrain Polytechnic becomes increasingly vital. We are proud to be shaping graduates who are not only ready for the workforce, but ready to shape it. This exhibition is also about inspiring the next generation of innovators and problem-solvers—those who will build on the ideas and skills showcased here today. This exhibition is a reminder that education is not just about knowledge—it's about shaping futures.

Professor Ciarán Ó Catháin
CEO Bahrain Polytechnic

A message from the DCEO

Welcome to the ICT Graduates Exhibition 2025, a celebration of academic achievement, innovation, and the pursuit of excellence that defines Bahrain Polytechnic's educational philosophy.

This exhibition represents the culmination of years of hard work and intellectual growth. It showcases the results of our continuous efforts to provide students with a rich and dynamic learning environment—one that promotes critical thinking, creativity, and problem-solving skills. At Bahrain Polytechnic, we are deeply committed to ensuring that our graduates are not only knowledgeable but equipped with the skills needed to meet the challenges of a rapidly evolving global landscape. Through rigorous quality assurance processes and close collaboration with industry partners, we ensure that our programs are aligned with both academic excellence and the needs of the wider community. This exhibition is a reflection of what can be achieved when education is driven by quality, collaboration, and a shared vision for the future. We are excited to see how our graduates will continue to make a positive impact in Bahrain and beyond.

Dr. Louise O'Nolan
DCEO Academic Affairs & Registrar

A message from the Dean

Welcome to the ICT Graduates Exhibition 2025. Today, we celebrate the achievements of our students and the vital role Bahrain Polytechnic plays in preparing graduates to thrive in a technology-driven world. This exhibition showcases not only the skills our students have acquired but also their ability to apply innovative solutions to real-world challenges. Each project presented here reflects a commitment to bridging the gap between academic knowledge and industry needs; a fundamental principle that guides our ICT curriculum. As Bahrain continues to position itself as a regional leader in digital transformation, the relevance of events like this cannot be understated.

The future belongs to those who can integrate technology with critical thinking, problem-solving, resilience, adaptability and creativity—traits embodied by the graduates we celebrate today. We are proud to see our students emerge as professionals ready to contribute to the ICT sector's growth and advancement. This exhibition serves as both a culmination of their hard work and a glimpse into the promising futures that lie ahead.

Dr. Christos Gatzoulis
Dean of ICT and Creative Media

Faculty of ICT 2025

By Abbas Almutawa

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Trained IDS model using machine learning

This project aims to develop an anomaly-based network intrusion detection system (ANIDS) that enhances cybersecurity by detecting advanced threats like zero-day attacks and APTs, which traditional signature-based systems often miss. NGN currently uses SNIDS such as Snort, which rely on known attack patterns and are ineffective against emerging threats. The proposed solution uses machine learning and real attack data to build a model with at least 96% detection accuracy. Built using Python, TensorFlow, and Keras, it supports both binary and multi-class classification, improving threat visibility. Although live deployment is out of scope, the project provides a validated, scalable model, complete with documentation and training scripts. This solution offers a modern, intelligent alternative to legacy systems and lays the groundwork for future integration into operational cybersecurity infrastructures.

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AI Powered CV Analysis With OCR and Teams Calendar Integration

The CV Analysis project is an AI-powered system that leverages OCR (Optical Character Recognition) to extract and analyze data from CVs with high accuracy. Using advanced natural language processing models, the system evaluates candidate profiles by comparing their skills and experiences against job descriptions, generating structured insights and ratings. Additionally, it integrates with Microsoft Teams Calendar to streamline interview scheduling and coordination. This automation reduces manual effort in the recruitment process, accelerates candidate shortlisting, and ensures better alignment between job requirements and applicant qualifications. The platform is designed to be user-friendly, efficient, and scalable for HR teams seeking to optimize talent acquisition through smart technology.

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Harvest Haven

Harvest Haven is an educational agriculture simulation game designed to promote sustainable farming practices through an engaging and interactive 3D experience. Targeted at a wide audience—including students, educators, and environmentally conscious learners—the game blends immersive gameplay with meaningful educational content. Players will encounter real-world farming scenarios, where they must make strategic decisions that influence the success of their virtual farms. Throughout the game, they will learn essential skills such as crop management, resource allocation, and sustainable land care.The game features vibrant, cartoon-style low poly 3D graphics that appeal to users of all ages, making learning visually enjoyable. A built-in progress tracking system assigns tasks, presents challenges, and monitors player performance to ensure a structured and rewarding learning journey.
By combining entertainment with education, Harvest Haven transforms complex agricultural concepts into an accessible, fun, and impactful experience—encouraging sustainable thinking in a digital world.

By Fatema Abdulla

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AI Network Anomaly Detection

The purpose of the project is to build an AI-powered network anomaly detection system that will help enhance security and monitoring of network traffic. The main goal of the system is to detect anomalous or suspicious network behaviors using machine learning instead of relying on manual observation or rule-based detection methods. The system captures real-time network traffic using a packet sniffer and analyzes it using a trained machine-learning model. It classifies traffic as either normal or anomalous, helping in the detection of possible threats. After identifying anomalies alerts are sent to the administrator to take quick action, and all detected anomalies are logged for further analysis. Overall, the project intends to provide an intelligent and automated solution for network security. It reduces the likelihood of human errors, improves detection accuracy, and helps in the early identification of attacks before they escalate or cause significant harm.

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ParkEase

ParkEase is a cloud-based car plate detection system and parking app designed to automate parking management and improve the user experience in Bahrain. The app uses AI-powered YOLOv8 for real-time license plate recognition and PaddleOCR for text extraction, enabling seamless vehicle monitoring and automatic entry. ParkEase streamlines the parking experience by eliminating manual ticketing. The system supports seamless entry, exit, and secure in-app payments. Users can select from flexible subscription plans based on vehicle count and preferred duration. Users can track parking history and receive notifications through an intuitive interface. The app ensures secure user authentication and data encryption. The admin panel provides insights into parking lot usage, vehicle history, and payment transactions, optimizing operational efficiency.

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Multicasting Network infrastructure implementation

The Higher Education Council (HEC) in Bahrain is planning to design and implement a multicasting networks among Universities and other related organizations, in response to huge potential for multicast-based live streaming of lectures from Bahraini universities and colleges. Several large companies and educational organizations nowadays are building multicast-based infrastructures to support multimedia, conferencing, or general multicast- based applications. This project aims to establish a high-performance, reliable, and secure IP multicasting infrastructure that supports real-time communication and content delivery among multiple campuses and educational bodies. The multicast network will enable one-to-many and many-to-many communication models while reducing network load and optimizing bandwidth usage.

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BGP Route Reflectors

The purpose of the project is to provide the client with a scalable and flexible network infrastructure that encompasses BGP (Border Gateway Protocol) route reflectors, routing protocols and security measures to provide a balance between high performance, security and decentralized connectivity. The main idea of the project is eliminating iBGP's (Internal BGP) full-mesh requirement, as well as solving the growing scalability issues impacting banking transaction speeds and causing growing security issues. The project aims to solve these issues by implementing a network solution focused on BGP, MPLS, DMVPN and traffic engineering. This solution reduces the number of iBGP sessions between routers in an autonomous system (AS), while preserving customer data and ensuring fast communication, as routers only need to initiate sessions with the route reflectors instead of every router in an AS.

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Globify.bh Responsive Website Development

Globify.bh expands Bahraini e-commerce by enabling customers to purchase global products and request international items at competitive prices. The platform's unique request system allows users to upload desired products for doorstep delivery in Bahrain. Built with PHP Laravel (using SQLite for lightweight database operations), Livewire for dynamic interfaces, and Tailwind CSS for responsive design, it features real-time order tracking, secure payments, and an admin dashboard for cross-border logistics. By automating complex import processes, Globify.bh makes global shopping accessible while supporting local businesses. Future upgrades include bulk-purchase discounts and expanded vendor networks, addressing Bahrain's demand for diverse products through optimized logistics.

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Al Salam Talents Platform In-house Marketing Agency

This project will create a secure, web-based platform connecting Bahrain Polytechnic students with Al Salam Bank as a student-led digital marketing agency. It will enable students to gain real-world experience by working on bank projects (campaigns), while the bank will access cost-effective, innovative solutions. The platform will facilitate project posting, student applications, task management, and approvals through role-based dashboards (students, clients, admins). Students will showcase skills via profiles, while clients will post briefs, track progress, and approve deliverables. Key features will include messaging, notifications, performance reviews, and analytics. The platform will align with the bank's privacy standards, replacing outsourcing with sustainable talent development. It will enhance student employability through practical portfolios.

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Bella Pizza e-commerce website

The purpose of the project is to deliver a user-friendly and high-quality cloud-based e-commerce web application for Bella Pizza, a Bahraini pizza restaurant aiming to enhance its digital presence and ordering system. The main goal of the website is to automate the ordering and customer interaction processes, which were previously handled manually or through third-party delivery applications that charged high commission fees.To gain more control over customer relationships and profits, Bella Pizza transitioned to an independent online ordering platform. The website offers an intuitive experience for both the business and its customers. Customers can seamlessly browse the menu, place orders, and complete payments using a secure payment gateway. Meanwhile, the restaurant staff can manage orders efficiently through the backend dashboard. Overall, the Bella Pizza website adheres to modern e-commerce standards, utilizing email notifications for effective communication and implementing robust security measures to protect user data and transactions.

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TeleLegacy Enterprise Telecommunication Security - Advanced Firewall and RBAC Policies

The project aims to build a secure, scalable network for TeleLegacy Bahrain, a multi-branch enterprise. It focuses on enhancing security through advanced firewall technologies, intrusion prevention, network segmentation, and role-based access control to protect data and ensure reliable communication. The objective is to protect enterprise data by applying multilayered security strategies. Current vulnerabilities stem from poor segmentation and outdated defenses. The solution ensures secure, uninterrupted communication across all branches.The solution uses Cisco ASA firewalls with advanced threat prevention like deep packet inspection and dynamic policies. It provides a policy-based environment to control access, monitor traffic, and reduce risks. Logical segmentation will isolate departmental traffic and minimize the attack surface. RBAC will be enforced using Cisco TrustSec, MAB, and 802.1x to control access by role and location. EVE-NG will be used for testing and validation. Administrators can monitor live traffic and generate reports through firewall tools, enabling real-time threat response and visibility across all branches. Overall, the project aligns with modern enterprise networking standards. Security mechanisms such as Access Control Lists (ACLs), intrusion detection and prevention systems (IDS/IPS), and segmentation policies will be deployed to ensure business continuity, secure communication, and protection of TeleLegacy's critical data and infrastructure.

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Tele legacy enterprise telecommunication security

The purpose of this project is to strengthen Tele-Legacy Bahrain's network security by implementing secure remote access via VPN, filtering malicious content through email security, and enforcing user access control using AAA through a Windows Server-based RADIUS configuration. Currently network setup lacks modern access restrictions and filtering protocols, leaving it exposed to unauthorized logins, unsecured remote access, and email-borne threats. There is also no centralized method for managing authentication to network devices.To address these issues, a Remote Access VPN using Cisco AnyConnect will be deployed for secure employee connectivity. A Windows-based RADIUS server will manage VTY and console access to network devices, allowing only authenticated users. Email filtering will be implemented to protect against phishing and suspicious content. The implementation will be designed and tested in a virtual environment using EVE-NG, with configuration, and security testing conducted.Overall, this project provides Tele-Legacy with reliable and scalable network security architecture, meeting industry standards and supporting secure operational growth.

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3D Car Rental Website

The project is a web-based 3D car rental platform designed to improve the online booking experience for car rental customers. Users can explore interactive 3D models of various cars, click on hotspots to view real photos of car parts (e.g., scratches, dents), and place reservations through a seamless “Book Now” feature. The system also includes an AI chatbot that assists users by recommending vehicles based on their preferences. Admins can upload vehicle photos and manage bookings. The website aims to offer a transparent and engaging car rental process for all types of vehicles, with a modern design and secure environment for users.

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Software Architect

BoxonVision lacks an employee management system for internal usage. The company registered employee punch in and punch out using a physical fingerprint reader at the door. The proposed system will fix these issues by providing a web application, using ASP.net MVC as the backend and Razor pages as the frontend. The push for a web-based application is not only for modernity, but also for convenience, as employees could log in from their homes regardless of platform to submit any documents or notes. An SQL database will be set up to store the user data and monitor employee punch in/out timings along with the dates to display for the HR employees. The system will ease up employee administration and workflow, as many of the manual requests and actions will be automated for ease of access and efficiency of time. Employees will be able to automatically generate documents, monitor attendance, check on pay slips, check other employee information, and upload sick leaves from home, all in a single unified web application.

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Gaming Hub Management System

Desktop Application: Developed in C# using Visual Studio, the application will launch automatically upon login, restrict access to other software, track user activity, and enforce session time limits. Additionally, it will feature a point-based reward system where users can accumulate points to earn free gaming time, with points being added only by administrators based on user purchases. The application will also show a popup message when a user has only 10-15 minutes left on their session to alert them about their remaining time. Database: Managed using MySQL with phpMyAdmin, the database will store user information, gaming session records, rewards data, and administrative logs. Weekly backups will be scheduled to ensure data integrity and security.

By Abdulla Alsudairy

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Grievance System

The Grievance Management System addressed inefficiencies in Bahrain’s municipal services by replacing a legacy Java-based system with a modern cloud-hosted platform. The outdated system caused delays and lacked transparency, hindering citizen satisfaction. The new solution digitized grievance submissions for building permits, urban planning, and corner sales, enabling citizens to track complaints in real -time. Municipal staff utilized automated workflows and analytics tools to prioritize resolutions and generate compliance reports. Developed on the Mendix low-code platform, the system integrated PostgreSQL for database management and AWS for scalable cloud infrastructure. Key features included role-based access controls, SSL/TLS encryption, and GDPR/ISO 27001 compliance. The project streamlined grievance handling, reduced resolution times by 40%, and improved public trust through transparent processes. Its unique value lay in rapid deployment using low-code technology and adaptability to future municipal needs.

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Fort Entry System

The aim of this project is to design a tablet application that will enhance the security operations of providing an intuitive, streamlined process for guest registration, tracking parking violations, and automatic ticketing. Security guards will use the application to verify guests, issue warnings for parking offences, and maintain records in an effective way. The project will be implemented in Java and built under the NetBeans environment and with the database to MySQL. The application will support various languages (English and Arabic) for various users from within the ministry.

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Park Entrance Ticketing System

The Park Entrance Ticketing System is a cloud solution aimed at transforming the ticketing experience for visitors to the Gardine Park. The system will computerize, automate, and centralize ticket sales, guest management, and revenue reporting in a way that eliminates the current inefficiencies of manual processing. The inefficiencies that are presently leading to long queues, ad-hoc ticketing policies, and unaccounted revenue data between the different park venues. The new system will consolidate the sale of tickets, facilitate real-time data capture, and provide quicker, easier entry for visitors, improving the experience overall. With significant emphasis on scalability, data security, and ease of use, the solution will be accessed through PCs and mobile devices, providing flexibility for staff and visitors.

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Gaming Hub Management System

Application : Developed in C# using Visual Studio, the application will launch automatically upon login, restrict access to other software, track user activity, and enforce session time limits. Additionally, it will feature a point-based reward system where users can accumulate points to earn free gaming time, with points being added only by administrators based on user purchases. The application will also show a popup message when a user has only 10-15 minutes left on their session to alert them about their remaining time. Database: Managed using MySQL with phpMyAdmin, the database will store user information, gaming session records, rewards data, and administrative logs. Weekly backups will be scheduled to ensure data integrity and security.

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Marine Safety Directorate Management System

This project involves developing a comprehensive management system for the Marine Safety Directorate (MSD) of Bahrain's Ministry of Transportation and Telecommunications. The system automates and integrates internal and external processes for marine safety and environmental protection services, reducing dependency on manual forms. Key features include an authenticated portal for service applications (permits, licenses, certificates), integrated online payments, automated workflows, inspection management, and interconnection with government systems including E-Key, Sijilat, and NPA. The solution enables MSD to efficiently manage maritime services such as vessel permits, marine pilot licensing, underwater surveys, and marine project approvals while maintaining compliance with maritime regulations and offering a streamlined experience for both internal staff and external stakeholders.

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Amaan Insurance Portal

The Amaan Insurance Platform was created to meet the rising demand for a centralized, easy-to-use solution for accessing and managing insurance policies in the GCC region. With the growing shift toward digital insurance services and a fragmented market, the platform aimed to streamline the process of exploring, purchasing, and managing insurance for both individuals and businesses. The project resulted in a robust mobile and web application that connected users with multiple insurance providers across the GCC. Users could create profiles, compare policies, purchase insurance, and handle claims effortlessly. Advanced features such as personalized recommendations, automated claims processing, and real-time policy updates were incorporated to elevate the user experience.

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Traditional Human Capital Management systems, such as RemoteApps HCM, often present usability challenges due to complex navigation and manual processes.

The Meme AI-Chatbot project addresses this by providing an intelligent, bilingual (English/Arabic) conversational interface integrated directly with RemoteApps.

Leveraging advanced cloud AI and secure API interactions, Meme allows employees to easily manage self-service tasks like leave requests, while HR personnel can access workforce analytics visualizations. The chatbot also provides quick answers based on company policies and Bahrain Labour Law.

Meme aims to significantly enhance user experience, automate routine HR processes, and boost operational efficiency for all RemoteApps HCM users.

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Document Management System

The Project is a Document Management System (DMS), a webpart for SharePoint that will help in managing documents and form documents. The Current DMS Bapco has is slightly dated and Bapco requires a newer DMS to replace it to help them access, manage, and compare documents with ease. The DMS will use SharePoint as the platform BAPCO uses currently, and the DMS will make use of React library with typescript for the front-end code. The DMS will be in the form of an SPFx Webpart that will be put within Bapco's SharePoint site. The PNP library is used tby sending API calls to retrieve information about files and folders in SharePoint. The product will feature a Document Comparer to compare different versions of a document. Also, there are browsing features to browse for documents, and a search feature with various filtering options. There is also a document upload request form to request for a document or form to be uploaded, the documents will then be reviewed.

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Gaming Hub Management System

Database: Managed using MySQL with phpMyAdmin, the database will store user information, gaming session records, rewards data, and administrative logs. Weekly backups will be scheduled to ensure data integrity and security. Desktop Application: Developed in C# using Visual Studio, the application will launch automatically upon login, restrict access to other software, track user activity, and enforce session time limits. Additionally, it will feature a point-based reward system where users can accumulate points to earn free gaming time, with points being added only by administrators based on user purchases. The application will also show a popup message when a user has only 10-15 minutes left on their session to alert them about their remaining time.

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AI-Powered Project Management System

This project introduced an AI-assisted task and cost management system designed to streamline project tracking, automate approvals, and provide real-time financial monitoring. By integrating smart automation, structured workflows, and predictive cost analysis, the system empowered project managers to make data-driven decisions, optimize resource allocation, and reduce administrative overhead.Key technologies included React.js for an intuitive interface, Django for backend processing, and MySQL for structured data storage. Financial data was integrated directly from external systems like Oracle ERP, ensuring accurate cost tracking and budget control. Microsoft Copilot provided AI-powered assistance, generating reports, automating notifications, and suggesting task prioritization based on deadlines and dependencies. What sets this system apart is its ability to not just track projects, but actively improve them—flagging risks, optimizing workflows, and providing real-time insights that help civil engineering firms stay on schedule and within budget. The result? More efficient project execution, better financial oversight, and higher success rates.

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Advanced Marketing Tools For Invent ITS

The proposed project aimed to enhance Invent ITS' digital presence and communication by developing modern and efficient platforms. The company's existing websites did not effectively showcase its services and brand identity, limiting client engagement and making it difficult to deliver important updates and announcements. To address these issues, the project developed a new Invent ITS Marketing Website and an Invent Medical Website. The websites provided a modern, user-friendly, and scalable platform to showcase services and improve client interaction. These solutions improved performance, responsiveness, and efficiency, allowing Invent ITS to strengthen its digital footprint, enhance communication, and improve client engagement, reinforcing its role as an innovative IT solutions provider.

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Incremental Enhancements and Maintenance of an Enterprise Software System using Agile Methodologies

This project focused on modernizing and automating manual business processes within Bapco Refining through a series of incremental development tasks. Existing workflows, including calculations, event management, and attendance tracking, relied heavily on manual intervention, resulting in inefficiencies, administrative burden, and increased potential for human errors. To resolve these challenges, multiple agile-driven tasks were completed, including the development, testing, and enhancement of various software tools. A Flutter-based QR scanner integrated with APIs was developed to automate event attendance validation effectively. Additionally, a dynamic SharePoint web part was created to facilitate comprehensive event management, consisting of participant registration, attendance tracking, and raffle administration capabilities. This web part utilized SharePoint lists, RESTful APIs, React components, and SCSS, providing an intuitive and unified user experience. Furthermore, future enhancements incorporating Power Automate and .NET backend solutions were identified, indicating scalability and extensibility. The uniqueness of this project lay in its agile and modular approach, allowing for continuous improvement and flexible adaptation to evolving organizational requirements, thereby significantly reducing administrative workload, minimizing errors, and enhancing operational efficiency.

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Automated Inquiry Management System for Ministry of Municipality Affairs and Agriculture

The Automated Inquiry Management System streamlines the handling of municipal inquiries directed to the Ministry of Municipalities Affairs and Agriculture. Previously managed through emails and letters, inquiries often faced delays and inefficiencies. This system provides a centralized digital platform for automated submission, tracking, and resolution. It enables seamless communication between municipal councils, the Capital Municipality, and the Ministry by automating inquiry routing, response management, and escalation workflows. Built on the Mendix Low-Code platform, it features role-based access, bilingual support, analytics, and automated notifications. By reducing response times, enhancing transparency, and eliminating manual inefficiencies, the system significantly improves municipal operations, ensuring a more structured, accountable, and citizen-centric service framework.

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Admin Portal of Chatbot

This project addressed the need for a system that handles a large number of customer queries in the most efficient, accessible way supported across multiple languages. This was achieved and addressed by the development of a chatbot that can answer their questions almost immediately, with an admin portal for admins to customize the chatbot based on their specifications and requirements without the need for developers. The system was built using Django for the backend, js for the front end, and PostgreSQL for the database. The chatbot frontend includes features such as speech to text, automatic language detection, contextual suggestions, and hierarchical smooth navigation. Moreover, the front-end implementation of a consistently designed system, standardized reactive components, and responsive layouts makes it easy for admins to configure the bot's settings, manage the knowledge base content, train the bot using new data, and view the system's statistics. What makes this chatbot standout is its capability to process and understand complex sentences and specialized terminology by using different acronyms across different languages. Eliminating the communication barriers and providing consistent answers regardless of the language preference.

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Judicial Banking Orders System (JBOS) Simulator

The BENEFIT Company requires a dedicated simulator to efficiently address the pressing need for a robust and dependable testing framework for the Ministry of Justice and licenses' requests and responses. This project will further enhance the performance of the current system by providing a comprehensive simulator environment which addresses any inefficiencies and reduces error rates, leading to improved overall system reliability. This project aims to solve these problems by offering a comprehensive solution including automated tools and reporting features to optimize and streamline request processing. Moreover, the solution will improve the accuracy of testing process and ensure the process of request validation. Thus, provide accurate system behavior under multiple conditions and provide reliable testing outputs.

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Invent ERP Mobile App

Invent ITS, a leading IT company in Bahrain, developed Invent ERP—an AI-driven, cloud-based ERP system designed for small and medium-sized businesses. It integrates essential business applications such as Sales, CRM, Accounting & VAT, Purchase, and Inventory to streamline operations. However, the system lacked a mobile-friendly solution, limiting accessibility and efficiency. To address this, a mobile application was developed using React Native and Expo, chosen for their ability to provide a seamless cross-platform experience for both iOS and Android. The app allows users to efficiently manage tasks, transactions, and reports from their smartphones and tablets, featuring an intuitive and responsive interface. Key functionalities include secure authentication (biometrics and 2FA), real-time push notifications, a comprehensive business dashboard, and advanced transaction management with filtering and search options. Additionally, web-view components were integrated to maintain consistency with the existing ERP system while optimizing performance and scalability.

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Summer Camp Registration System

The summer camp registration system was created to improve the old registration process for children of Bapco employees. The previous system was inefficient, which led to user dissatisfaction. This new web application simplified registration, improved the user experience and supported the goal of Bapco employee satisfaction. The system was developed by React JS, and allowed employees to easily see summer camp activities, enter their children's information and choose activities. Validation features reduced errors, and protected practice preserved user information. This system also implemented rules, such as a maximum of two registrations per employee and two activities per child. The project focused on user-friendly designs and modern technology, demonstrating Bapco's commitment to innovation and support to their employees and their families. Gradually, it improved efficiency and strengthened community within the organization.

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WhatsApp Campaign Management System

Effective client communication is essential for engagement, service promotion, and customer satisfaction. Ithmaar Bank relies on SMS, emails, and push notifications but struggles to reach inactive users and provide interactive engagement. To overcome these challenges, the bank integrated the WhatsApp Business API into a .NET application, improving communication with corporate clients. This system enables automated marketing messages, promotions, and updates, expanding audience reach while ensuring interactivity. It also streamlines campaign management while utilizing a user-friendly interface. By leveraging WhatsApp's widespread use, the project enhances real-time communication, making client interactions more effective and responsive. This approach strengthens customer relationships and boosts engagement across both active and inactive users.

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Sufrah

Sufrah is a modern, web-based food ordering application designed to streamline restaurant orders without the need for phone calls. The platform enables users to browse restaurants, view menus, customize orders, and track their status in real-time. By integrating restaurant management tools, secure user authentication, and order processing automation, Sufrah ensures a seamless and efficient ordering experience. The main challenge in the current food industry is reducing miscommunication, minimizing errors, and enhancing order accuracy. Many food ordering platforms require manual effort, leading to delays and inefficiencies. Sufrah eliminates these issues by providing a centralized digital system for both customers and restaurant owners, improving overall speed, reliability, and user satisfaction.

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Finance by Emma

The Finance Education Portal was developed to address the growing need for accessible and engaging financial education in today's fast-paced world. With rising financial challenges such as mounting debt and poor retirement planning, there was a clear demand for a platform that empowered individuals to make informed financial decisions. The portal aimed to bridge the financial literacy gap by offering high-quality educational materials, interactive tools, and a supportive community for learners at all levels.The project delivered a comprehensive online platform featuring structured courses, live workshops, and AI-driven personalized support. Key functionalities included interactive quizzes, financial calculators, and multilingual content to cater to a diverse audience. Secure payment systems were integrated for course purchases and event registrations, ensuring a seamless user experience. Advanced analytics tools were implemented to track user progress and provide insights for continuous improvement.The platform was built using modern technologies, including React.js for the frontend, Node.js with Express.js for the backend, and MongoDB for the database. Dialog flow powered the AI chatbot, while BenefitBay handled secure payment processing. The use of Figma ensured an intuitive and responsive user interface.What set this platform apart was its combination of research-driven content, personalized learning experiences, and community engagement features. By fostering collaboration and empowering users to build lasting financial habits, the portal set a new standard for online financial education.

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HecSys

"HecSys" is a Web App contains three forms. The purpose of this Web App is to help Higher Education Council to fast the process of applications (Requests) regarding several type of requests such as hiring new Employees, new members in the board of trustees and assigning employees in leadership roles.The project attempts to solve a problem of using paper-based system to collect applications (Requests) from higher education institutions which is outdated system that is not practical in these days. Therefore, the project will provide automated system to collect applications (Requests) which will be more efficient than the older system and it has time advantage which will reduce time consuming.The project will solve the problem using different technologies. First, Asp.net (Model-View-Controller) is the framework that used to implement the Web App. Secondly, for cloud solution, the project used three services from AWS which they are S3, EC2 and RDS. Finally, for the Database, the project created the database following (database First Approach) and the ERD was Designed "Using SQL Power Architect".

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In-house Marketing Agency

This project comprises creating a digital platform for Al Salam Bank's internal marketing agency. The platform will handle freelancer management, project briefs, communication tools, and real-time analytics, giving students practical experience in marketing and technology.

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Software Engineering an Enterprise Software System

This project addresses the critical business need for maintaining and enhancing a major enterprise software system to ensure stability, scalability, and improved functionality for clients. As the system serves a large user base with evolving requirements, continuous updates, bug fixes, and feature enhancements are essential to meet client expectations and maintain competitive advantage. The project focuses on delivering incremental improvements to the system, including new feature implementations, bug resolutions, and internal tool development, all of which contributed to a more robust and user-friendly product.To achieve these goals, the project leverages modern technologies such as Angular for the frontend,NestJS for the backend, and MongoDB for database management. TypeScript and Node.js are used to ensure type safety and efficient server-side execution, while tools like GitHub and Jira facilitated version control and task management. The agile development methodology, including bi-weekly sprints and daily standups, ensured timely delivery and adaptability to changing requirements. Code reviews, automated testing, and CI/CD pipelines are integral to maintaining high-quality standards and seamless deployment. The uniqueness of this project lay in its client-centric approach, ensuring that every enhancement directly addressed user needs and improved their experience. By combining cutting-edge technologies with agile practices, the project delivered a scalable, maintainable, and high-performing system that met both business objectives and client demands.

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TaqyeemPro

BQA in Bahrain has launched TaqyeemPro, an AI-powered system for creating and managing national exams. Built on AWS cloud technology, it helps generate Arabic and Mathematics exam questions for grades 9 and 12. The system automatically adjusts question difficulty based on student performance, making exams more accurate and reducing test time by 40%. It also lowers administrative work by 50% and improves how student abilities are measured. Using AI and machine learning, TaqyeemPro creates interactive questions and provides instant feedback through analytics. It also ensures data security with AWS protections. This new system makes exam creation easier, faster, and more effective compared to traditional methods.

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Sama Pets

The company aims to expand its business to cater to animal companions with a system that includes comprehensive data management features. Allowing for the creation and management of pet profiles, encompassing owner contact information, pet details, and service history. Additionally, the system enables the updating of individual pet records, including breed, age and health records.For services, it will feature a module to manage various services for pets, such as grooming, training,and veterinary care, complete with descriptions, pricing, and availability. An integrated calendar system will facilitate appointment scheduling, enabling pet owners to book services through SamaPet website. the project contains three projects admin dashboard, a website, and a mobile application, all of which are still incomplete. The technologies used for the projects development include Angular and laravel framework. The languages: HTML, CSS,Typescript, and PHP. MySQL for database.

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Dimuma ESG Solution

The project was designed to provide an easy-to-use, streamlined platform for generating Environmental, Social, and Governance (ESG) Reports, alongside offering sustainability solutions for companies. The core purpose is not just to create reports, but also to simplify the breakdown of ESG data, transforming it into actionable insights that can help businesses set meaningful objectives and make improvements. By doing so, it supports smoother transitions toward better sustainability practices and performance tracking. Dimuma's goal is to build on these methodologies, fostering continuous improvement and uncovering new opportunities for growth. The data collection process is intuitive, making it user-friendly and simplifying the report generation workflow, ensuring a cohesive and efficient experience.

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Digital Menu

The implementation of a digital menu developed the dining experience by enhancing customer engagement, restaurant operations, and eliminating the need for printed menus. Traditional menus were expensive to update and lacked interactive features, while the digital menu provided a dynamic and contactless solution with real-time updates, high quality visuals, and multilingual support. Using Google-powered Flutter platform alongside comprehensive Dart language ensures responsiveness across multiple devices. QR codes placed on tables allow customers to instantly access the menu, reducing waiting times. The system also generates customer preference analytics, helping restaurants improve their offerings. The digital menu includes key features such as category-based browsing, search and filters, detailed item descriptions, customization options, high-quality images and videos, special discounts, and social sharing. Multilingual support ensures accessibility for diverse customers, while feedback and ratings enhance decision-making. For restaurant administrators, the Flutter Web-Based Admin Panel provides real-time menu control, discount and promotion management, inventory tracking, and QR code generation for seamless customer access. Overall, this digital menu solution offers a cost-effective, eco-friendly, and modern alternative that meets evolving dining expectations while improving efficiency and customer satisfaction.

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Tender and Auction System

The Ministry of Municipalities handles numerous tenders annually, currently managed manually. To enhance control, speed up execution, and streamline procurement, stakeholders aim to digitalize the process. Integration with systems like contract management will allow better tracking without physical meetings. Various directorates will collaborate efficiently, improving communication and coordination. A digital system will enhance accuracy, reduce errors, and ensure a more cohesive workflow. Using Mendix's low-code platform enables rapid deployment, scalability, and flexibility to adapt to future needs. This transformation will drive cost savings, increase transparency, and improve procurement performance. By eliminating manual inefficiencies, the ministry will establish a more professional, structured, and effective approach to tender management, ultimately benefiting all municipal stakeholders.

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Moeen - Volunteering Platform for All

Volunteerism plays a crucial role in societal development, yet many platforms fail to cater to the specific needs of youth. Moeen project addressed this gap by developing a centralized and culturally relevant platform to connect volunteers, organizers, and sponsors in Bahrain. It empowered the youth to gain hands-on experience while supporting community initiatives, ultimately fostering a stronger culture of social responsibility.What makes Moeen truly unique is its holistic and localized approach to volunteerism by offering advanced volunteering opportunities. Moeen was tailored to align with Bahrain's cultural and social landscape, ensuring high engagement from youth, partnerships, and NGOs. Also, the combination of real-world skill-building, automated certification, and sponsor engagement made it a comprehensive tool for empowering youth through experience-based learning.

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Services Management Dashboard

The Service Management Dashboard is a centralized system developed for the Information & eGovernment Authority (iGA) to enhance the management and coordination of government services across various ministries. It aims to increase efficiency, improve data accuracy, and promote better coordination among various government entities. The system consists of two core components: the Service Review Module, which ensures the accuracy of published service information, and the Enquiry Management Module, which allows ministries to raise, monitor, and resolve enquiries in a more organized manner. As part of this project, I am specifically working on the Enquiry Management Module, focusing on improving tracking, resolution. The system is built using modern web technologies, offering a secure, user-friendly, and scalable solution that supports effective service delivery.

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Potential Fish Zone

The project was aimed to develop the analysis used in the marine to make decisions that targets specific benefits. This system analysed satellite imagery for possible fish zones that identified color-coded indicators of probability levels and other metrics. By analysing sea surface temperature, chlorophyll concentration, and ocean currents, it identified where fish were likely to aggregate, enabling targeted fishing and more effective decision making about fish bans. The potential fish zone was developed as a web application, utilizing technologies like Next.js as a framework. Supabase served as the database to store information. Tailwind CSS and JavaScript were the languages used for the frontend development. Moreover, GEE provided advanced image processing capabilities. It contains data analysis dashboards, and security measures to protect sensitive marine resource information.

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Bahrain Diabetes Society (BDS) Website

Bahrain Diabetes Society (BDS) is launching a new bilingual (Arabic and English) website to replace its outdated website, streamlining operations and strengthening community engagement. Key improvements include user-friendly website with membership registration, secure payment options, a digital photo archive, and an educational library on diabetes care. The site will also feature an automated fee reminders, an event invitation system, and AI-assisted search for smoother navigation. These enhancements aim to simplify processes, support diabetes awareness, and provide an accessible online experience aligned with BDS's mission of promoting better health and prevention across Bahrain.

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Project Management System

The Project Management System was designed and implemented for the Ministry of Municipalities Affairs and Agriculture to address the inefficiencies of project planning management, task and resource management, milestone tracking, communication, documentation, approval automation, reporting, dashboards, finance integration, and project closure. These tasks were accomplished using Excel spreadsheets and emails prior to this system, thus making management more cumbersome. The system was created on the Mendix platform, enabling the creation of a custom web application. One of the advantages of this solution is that it integrates finance functions and reporting, automating workflow between functions. The system provides tailored reporting and dashboards so that users have the flexibility to report data relevant to their own roles.

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Enhancement of the Commercial Registry System (Sijilat)

The project addressed the need to enhance the Commercial Registry System (Sijilat) used by businesses in Bahrain for registering and managing commercial records. The existing system required improvements to streamline key business processes and migrate existing services from Sijilat 2.0 to the new version. The project involved developing a new system that allows users to log in, view their applications, and submit three key service requests: Change Financial Year, Change Company Period, and Change Group Company Name. The solution integrated the new system with the existing BizActor framework, ensuring seamless data transfer and improved processing efficiency.The project was built using React + TypeScript for the frontend and C# .NET Core for the backend. MySQL was used for the database, and Postman was employed for API testing and documentation. Version control was managed through Git.This project improved user experience, increased processing speed, and ensured data consistency across the Commercial Registry System, providing a more efficient and user-friendly platform for businesses in Bahrain.

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Sama Bahrain Pet Card

Sama Bahrain Pet Card is a digital platform designed to support pet owners by providing a unified system for managing pet care expenses and services. The project integrates an exclusive discount card, allowing users to save on pet essentials such as food, veterinary care, and grooming. It features a web and mobile application where users can register, track savings, and access various pet-related services in one place. The backend is developed using Laravel PHP with MySQL for database management, while the frontend utilizes Angular, TypeScript, and the Ionic framework for a responsive mobile experience. Firebase is used for authentication and data storage. This project enhances pet care accessibility and affordability, offering a seamless solution for pet owners.

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Mena Motion Logistics Platform

This project addressed a significant need in the logistics industry, where effective fleet management and driver coordination were crucial for operational efficiency. The solution streamlined these processes, enhancing communication and tracking capabilities. The project implemented a web-based application that facilitated real-time monitoring of fleet movements, driver assignments, and order management. It provided users with an intuitive dashboard displaying critical information, enabling quick decision-making and improved resource allocation. To achieve this solution, modern web technologies were utilized, including Next.js for the front-end interface, Ruby on Rails for the back-end server, and PostgreSQL for data storage. The application incorporated features such as user authentication, interactive maps for tracking vehicles, and notifications for order updates. What set this product apart was its focus on user-centric design and its ability to integrate with existing systems, providing a flexible solution that adapted to various business needs.

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Foremarket - A Market Space for Golfers By Golfers

The Foremarket golf marketplace application faced significant challenges with its dual-codebase structure in Swift and Kotlin. This fragmented approach resulted in high maintenance costs, inefficient bug tracking, and inconsistent user experiences across platforms. The solution was creating a cross compatible application to share the code bases, versions and releases.The project delivered a rebuild of the Foremarket application using React Native with Expo framework. This cross-platform solution replaced separate native applications while maintaining full functionality including authentication, listings, real-time chat, and payment processing.

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AI-Powered Server Health & Anomaly Detection Agent

The AI-Powered Server Health & Anomaly Detection Agent is an AI-driven system designed to enhance IT infrastructure monitoring by detecting performance anomalies and security threats in real-time. Traditional monitoring methods rely on static thresholds, often failing to identify critical system issues. This solution leverages AWS services such as CloudWatch, Lookout for Metrics, Lambda, and SNS to automate log analysis, anomaly detection, and alert notifications. Historical logs are stored in Amazon S3, with optional visualization using QuickSight for trend analysis. By providing proactive issue detection, automated alerts, and insightful analytics, this system helps IT teams minimize downtime, improve system reliability, and optimize business operations.

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Centralized Customer Information Management System

The Royal Humanitarian Foundation (RHF) Centralized Customer Information System was developed to streamline customer data management by replacing fragmented records across multiple systems with a unified web application. The system integrates with RHF's existing database, providing a secure and user-friendly interface for administrators to access and update customer details efficiently. Built with .NET 9, Entity Framework Core, and Bootstrap, it features role-based access control, localization (Arabic and English), and AJAX-powered dynamic data loading for improved performance. By centralizing customer information, the system enhances data integrity, reduces errors, and optimizes administrative workflows. Securely deployed in collaboration with RHF developers, this solution ensures seamless integration with RHF's IT infrastructure, significantly improving operational efficiency.

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Institutions Ad Request Follow-up

The Institutions Ad Request Follow-up system will streamline and secure advertisement request management for educational institutions, replacing inefficient manual processes. It will enable institutions to submit, modify, and track requests digitally while enforcing user roles via ASP.NET Core MVC with Identity Authentication. Users can upload documents and select advertisement types through a structured form. The system will support Arabic and English, allow secure file attachments, and use Entity Framework Core with SQL Server for efficient data management. By centralizing requests and enforcing authentication, it will enhance security, reduce unauthorized access, and streamline approvals.

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Hazard Risk Analysis (HRA)

The Hazard Risk Analysis (HRA) system enhances food safety inspections for the Local Food Control Section at the Ministry of Health. Previously, inspectors relied on fragmented systems and manual entry, leading to redundancies, delays, and inconsistent risk assessments. A web-based application was developed using ASP. NET Core and .NET 9, with SSMS for secure data management and Bootstrap for a responsive UI. It automates inspections, centralizes data retrieval, and improves risk analysis. Key features include role-based access control, API integrations, automated alerts, and cloud hosting on Microsoft Azure. By eliminating inefficiencies and replacing its current state, the system enhances compliance tracking, streamlines inspections, and improves decision-making through data-driven risk assessment.

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Taqeem System

The Government Service Centers Evaluation System is a digital platform designed to assess and manage the performance of government service centers. The project involves upgrading an existing system to modern technologies to improve performance, security, and usability. The upgrade will transition the system to Angular (frontend), Java Spring Boot (backend), and PostgreSQL (database) while ensuring minimal disruption to ongoing operations. This guideline aims to explain the essential tasks and functions available in the Government Service Centers Evaluation System and how users can manage them based on their different roles and permissions. It provides a step-by-step explanation of adding users according to their roles and permissions, as well as adding and modifying government service centers. Additionally, this guide offers a detailed explanation of the evaluation process for government service centers, including the steps for evaluation, re-evaluation, and extracting evaluation results. Thus, this guideline serves as a reference for answering user inquiries regarding the core functions of the Government Service Centers Evaluation System.

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Services Management Dashboard

The Service Management Dashboard is a comprehensive system developed for the Information & eGovernment Authority (iGA) to streamline the management of government services across multiple ministries.
This system was implemented as a best practice for enhancing communication and collaboration, centralizing service-related requests for greater efficiency. It includes a Service Review Module that ensures the accuracy and consistency of service information post-publication, and an Enquiry Management Feature that enables ministries to submit, track, and resolve service-related inquiries seamlessly. As part of this project, I am specifically working on the Enquiry Management Feature, focusing on improving tracking and resolution. Built with modern web technologies, the system provides a secure, scalable, and responsive interface, ultimately improving transparency and the reliability of e-services for the public.

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Amaan - Insurance platform (Travel health insurance app)

Amaan is a digital insurance platform designed to connect users with multiple insurance providers across the GCC region. The application enables individuals and businesses to compare, select, and manage various insurance policies, including health, life, property, and commercial coverage. Amaan offers a seamless and user-friendly experience with AI-powered recommendations, automated claims processing, and real-time policy updates. By integrating advanced insurtech solutions, the platform enhances accessibility, transparency, and efficiency in the insurance process. Developed in collaboration with industry professionals, Amaan aims to simplify insurance management while ensuring compliance with regional regulations. This innovative platform positions itself as a comprehensive and reliable solution for modern insurance needs in the GCC market.

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Optimizing Bahrain's Energy Mix for Sustainability and Net-Zero Goals

The proposed project will focus on optimizing Bahrain's energy mix to align with sustainability and net-zero goals. Given the increasing demand for energy and the country's commitment to environmental sustainability, it is essential to develop an optimization model that balances cost-effectiveness and emissions reduction. The project will leverage optimization techniques to determine the most efficient energy production strategy for Bahrain from 2025 to 2060.

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SynergyTool

The Synergy Tool streamlines SME partnerships for government procurement by addressing challenges in finding partners, accessing reliable information, and meeting regulatory requirements. Acting as a digital matchmaking platform, it connects businesses based on shared goals, ensuring fair competition in tenders. Integrated with Sijilat and eKey, it ensures credibility and compliance. A keyword search engine enhances usability for efficient partner identification. Developed using ASP.NET Core, Microsoft SQL Server (AWS-hosted), and secure authentication mechanisms (OAuth 2.0, JWT), the platform ensures seamless performance, scalability, and security. The implementation of role-based access control (RBAC), SSL encryption, and automated data verification guarantees transparency and reliability. What sets this tool apart is its ability to streamline partnership formation in a structured and accessible manner, fostering inclusivity, efficiency, and economic growth. The Synergy Tool revolutionizes SME participation in government procurement, bridging the gap between businesses and national opportunities.

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Sijilat 3.0

The Ministry of Industry and Commerce manages the Sijilat website for commercial registration (CR) applications. However, inefficiencies in manual processing and system limitations cause delays and frustration. This project aimed to enhance the Sijilat system by streamlining processes, improving user accessibility, and reducing manual intervention.
Key services such as CR search, new CR requests, licenses, and updates were made more efficient and user-friendly. A modern web-based platform was developed using HTML, CSS, JavaScript, C#, and SQL, along with Canva, Figma, and draw.io for design. Custom APIs and a structured database improved data handling, security, and regulatory compliance, resulting in a faster, more efficient, and transparent CR registration process.

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Arabic Translation Management Application

The Arabic Translation Management Application is designed to optimize the translation process by providing a structured workflow for translation requests. The platform enables translation requesters to seamlessly submit text for translation, which is then assigned to qualified translators based on expertise and availability. The system efficiently manages the entire translation lifecycle, ensuring tasks are properly assigned, tracked, and completed within designated timeframes. Requesters can monitor progress in real-time, receive notifications for updates, and submit feedback or revision requests to maintain high-quality translations. Additionally, the platform provides a direct means of communication between requesters and translators, eliminating inefficiencies such as manually searching for translators or relying on email-based communication. It also ensures consistency and accuracy by utilizing certified native Arabic speakers.

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Chatbot

This project focuses on developing an admin dashboard and chatbot backend specifically customized for businesses seeking AI-driven solutions. A previous chatbot was created but is now dated. Therefore this project will be about building a new chatbot from scratch with cleaner code and better performance. The dashboard will serve as a centralized platform where organizations can monitor AI insights, manage services, train their bot, specify answers to the user's questions and track key metrics. The chatbot will be designed to enhance user interaction by automating responses, providing real-time assistance, and improving overall customer support efficiency.

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Taqeem System

TaqyeemPro is an innovative, AI-driven national examination platform developed by Bahrain's Education & Training Quality Authority (BQA) to enhance student assessment. Built on AWS, the system utilizes generative AI and adaptive testing to create curriculum-aligned Arabic and Mathematics questions for grades 9 and 12. By leveraging Amazon Bedrock and SageMaker, TaqyeemPro dynamically adjusts question difficulty based on student performance, reducing test duration by 40% and improving assessment accuracy by 35%. The platform integrates rich media elements, automates question generation, and provides real-time analytics via Amazon QuickSight. Designed with robust security measures, TaqyeemPro modernizes Bahrain's education system, ensuring efficient and comprehensive evaluations.

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Sama Pet Care

Sama Bahrain Card Company, established in 2015 and fully managed by Bahrainis, has a strong focus on community support. To address the rising costs of veterinary care, the company is launching Sama Pet, a Health Saver Card designed to make pet healthcare more affordable. The system will automate user and pet profile management, allowing for easy tracking of medical histories and appointments. It will streamline the onboarding process for veterinary service providers and simplify service listings, ensuring a smoother experience for both pet owners and providers. By offering discounted services, Sama Pet aims to reduce the financial burden on pet owners while improving access to quality care.

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Sama Pets

The project, Sama Pets, was developed to address the significant need for integrated pet care management services that streamline access to information and services for both pet owners and providers. The initiative included the creation of a website, a mobile application, and a dashboard, forming a comprehensive ecosystem that supports the entire spectrum of pet care activities. The website offers detailed information and facilitates online booking, serving as the primary interface for users seeking pet care services. The mobile application, developed using Ionic for compatibility with both Android and iOS platforms, allows pet owners to schedule appointments, receive notifications, and access services on the go, ensuring flexibility and convenience. For service providers and administrators, the dashboard component provides robust analytics tools, enabling real-time insights into business operations, customer behavior, and service effectiveness. These components were built using cutting-edge technologies including Angular for front-end development and Laravel for back-end operations, ensuring a scalable, responsive, and efficient platform. Unique in its integration, Sama Pets stands out for offering a unified solution that enhances user experience while optimizing operational efficiency across the pet care industry.

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Safe Logistic

This project involves building a modern, high-performance company website using Next.js for the front end, leveraging its server-side rendering and SEO-friendly features. The UI will be styled with Tailwind CSS to ensure a responsive, consistent design across devices. The backend will utilize an ASP.NET MVC API to handle business logic, data processing, and database interactions, following the Model-View-Controller pattern for scalability and maintainability. The Next.js frontend will consume API endpoints from the ASP.NET backend, ensuring seamless data flow and dynamic content rendering. Tailwind's utility-first approach will streamline styling, while Next.js optimizes performance and user experience. The ASP.NET API will provide secure authentication, RESTful services, and database integration (e.g., SQL Server). This architecture ensures separation of concerns, cross-platform compatibility,and efficient development workflows.

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Grievance System

The Grievance Management System is a cloud-based platform for the Ministry of Municipalities Affairs and Agriculture in Bahrain, designed to replace the outdated Java-based system. Built using Mendix, it will allow citizens to submit and track complaints related to building permits, urban planning, and municipal services, while municipal staff will have access to automated workflows, real-time notifications, and analytics. The system aims to enhance efficiency, transparency, and citizen satisfaction by digitizing grievance handling, reducing delays, and improving decision-making. It will be hosted on AWS, Azure, or Google Cloud with a PostgreSQL database. Deliverables include software deployment, documentation, security compliance, and user training, with project completion scheduled for May 2025.

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PTR (Personal Time Record) Upgrade

The Personal Time Record (PTR) system played an important role in the company by collecting and tracking employees' working hours, assuring accurate time reporting and payment processing. Previously, the PTR system was based on End-of-Life (EOL) physical servers that required constant maintenance. These servers were subject to failure, could not keep up with escalating demand, and constituted a significant danger of system disruption. To overcome these challenges, the project moved the PTR system from physical servers to a virtual machine-based environment that utilized advanced virtualization technologies such as VMware. This upgrade increased the system's flexibility, efficiency, and scalability. The improvements included increased dependability as the virtual environment was more resilient and less inclined to failure, reduced downtime, lower maintenance and operational costs, enhanced performance to handle increased demand, and improved scalability for future business requirements. Other vital tasks handled throughout the upgrade included improved backup systems, optimized network connectivity, advanced security measures, and smooth interface with SAP and other essential components. Overall, the upgrade created a more durable, flexible, and cost-effective PTR system that can adapt to future business requirements and meet the company's growth and efficiency objectives.

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Cloud-Based Booking and Shift

D11 Gaming Hub in Bahrain faced difficulties due to manual booking and staff shift management. Customers had to contact the manager for bookings, and staff schedules were managed via Google Docs, leading to miscommunication. To solve this, a cloud-based booking and shift management system was developed. Customers can now view available spaces, book sessions online, and make secure payments via the AFS gateway. An admin panel helps staff manage bookings and schedules efficiently. Built with WordPress and hosted on AWS Lightsail, the system includes automated emails, role-based access control, and SSL encryption. This tailored solution streamlines operations by integrating booking, payments, and staff management into a single platform, improving efficiency and customer experience.

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Tender and Auction System

The Ministry of Municipalities handles numerous tenders each year. Currently, this process is managed manually, but municipal stakeholders are looking to digitalize it. The aim is to enhance control, speed up execution, and create a more streamlined and professional approach to procurement. By integrating the application with other systems, such as the contract management system, the municipal team will be able to track contracts more efficiently without having physical meetings. Various directorates within the ministry will collaborate on tenders, and by digitalizing the process, all teams can work more efficiently and accurately. Additionally, the system will improve communication and coordination across departments, leading to a more cohesive workflow. With Mendix low-code development environment, the solution will ensure rapid deployment, scalability, and the flexibility to adapt to future needs. This transformation will ultimately drive cost savings, increase transparency, and improve overall procurement performance.

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Awali Booking System

A web-based appointment booking system was developed to streamline scheduling at Awali Hospital, providing Bapco employees and their families with a seamless and efficient way to manage medical appointments. The system allows patients to book, modify, and cancel appointments online while offering real-time doctor availability, a search feature by specialization and department, secure online payments, and an AI-powered chatbot for patient support. Built on Microsoft Azure, it incorporates an Azure SQL Database, an Azure Virtual Machine for hosting, SSL encryption, and automated backups for security and reliability. By reducing manual workload, optimizing doctor schedules, and minimizing appointment conflicts, the system enhances hospital efficiency and significantly improves the patient experience.

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D11 Customer Relation Management System - D11 CRMS

The D11Customer Relation Management System - D11 CRMS aims to improve gaming center operations and user experience by integrating a public website and an administrative application. The website provides access to gaming packages, pricing, and games, while the administrative application offers secure user authentication, session tracking, and reward point management. Predictive analytics monitor peak usage hours for business decision-making. The system uses HTML, CSS, JavaScript for frontend, PHP for backend operations, and MySQL for database management. Security measures include role-based access control, SSL encryption. Additional enhancements include cloud-based backups, automated reporting, and Active Directory integration for administrative control. This centralized approach to gaming center management enhances operational efficiency, data security, and customer experience.

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BeaConnect Attendance Management System

This project is needed to ease the attendance tracking process for both teachers and parents. Due to the massive number of students skipping class, teachers will be able to track if the student attended other classes to ensure they are not skipping the current class. The project is an online system hosted on AWS using Wordpress that will be integrated with an attendance tracking system. Once teachers mark a student as absent, an email notification will automatically be sent to the parent. This will help ensure the students safety and keep parents informed and on track of their children's attendance. The system will have AWS services such as SMTP for email notifications and database to store all the attendance details throughout the school year to allow teachers to identify the absence pattern of each student. The unique thing about this product is the real time attendance tracking and immediate email notifications to reduce manual work and enhance communication between parents and teachers. This system also keeps the administration informed to take action incase of students skipping classes or school to prevent themselves from taking quizzes, tests, or even submitting assigned tasks. The system will be hosted on AWS to ensure its flexibility, accessibility, and privacy.

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ERP System

Frappe is free and open source ERP system this project aims to simplify processes across multiple departments including HR, Sales, and Helpdesk. This system will save both time and money, ensuring better operational efficiency.

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Power Automate Workflow Automation for Key Business Processes

In its attempt to take operations into the current era, AJM Kooheji Group is implementing a project for deploying Microsoft Power Automate with an aim to automate and streamline repetitive and tracking processes. The company hopes to cut down on manual interventions, minimize errors, increase operational efficiency, and provide greater visibility into ongoing requests. By leveraging the integration of Power Automate with Microsoft 365 applications like Teams, Outlook, SharePoint, and Excel, the project aims to have a single workflow environment. The adoption of low- or no-code solutions facilitates deployment, encourages standardized procedures, lowers variability, and maintains operational consistency.

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Design and Implementation of a Residential Employee Network

The Residential Employee Network project aims to modernize SKD Group's outdated network by designing a secure, scalable, and high-performance solution for its residential facilities. Key objectives include delivering reliable high-speed connectivity, enhancing security through firewalls, VPNs, and intrusion prevention systems, and implementing network segmentation using VLANs to separate employee, guest, and IoT traffic. The network will be scalable to accommodate future growth and integrated with Zabbix for real-time monitoring and issue detection. Benefits include improved employee productivity, robust data protection, enhanced user experience through QoS policies, and reduced upgrade costs. The project aligns with SKD Group's commitment to innovation, employee well-being, and operational excellence.

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Cloud-Based Employees Workflow System

The Cloud-Based Employees Workflow System was developed to enhance the efficiency of internal task and request management at Bank ABC. The project aimed to automate and streamline workflows, reducing administrative tasks and improving communication. The system allows employees to submit, track, and manage tasks through a user-friendly interface, with better insights on workload and task distribution. The solution was achieved through a cloud-hosted platform built on Amazon Web Services (AWS) for a scalable infrastructure, WordPress with custom plugins for front-end, and PHP for back-end functionalities. Key features include real-time email notifications, risk and task categorization by type and priority, and a centralized communication channel. This product's ability to digitize routine processes, reduce paperwork, and offer real-time task status and management insights is what makes it unique. By simplifying internal processes, the system increases productivity and creates a more sustainable and paperless environment.

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Firewall and User Support System Update

System updates, both software and hardware, are an important part of maintaining efficiency in the workplace. As new technologies and features are introduced it is up to the system administrators to make sure that the technology present in the workplace is kept up to date with these new advancements.The user support system at the Social Insurance Organization was due for a routine update, and with it being the integral point of communication between all departments and workings within the organization, it was imperative that the system is kept up to date to ensure improved efficiency within the workplace by implementing new technology introduced with these updates. In addition, it was about time the organization replaced its old firewall with new technology, and as such that too needed an upgrade in order to make sure that the organization's security was up to date. The user support system updates, rolled out on ManageEngine ServiceDesk Plus, have introduced a number of new features, from seamless formatting, interface customization, and even A.I integration, in addition to engine improvements, tweaks, and fixes. As for the new firewall, more advanced technology was required to match the organization's growth and advancing technology.

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Cloud Infrastructure Deployment Using Microsoft Azure

This project explores cloud infrastructure deployment using Microsoft Azure, focusing on cloud storage, virtual machines, and network communication. The study aims to assess the impact of cloud storage on on-premises IT environments, compare Virtual Machines (VMs) with Virtual Machine Scale Sets (VMSS), and implement virtual network peering for enhanced connectivity. By analyzing security, cost-effectiveness, and performance, the project will help businesses make informed decisions on cloud adoption. The outcome will provide insights into scalable, secure, and cost-efficient cloud solutions, ensuring high availability and streamlined communication between cloud-based networks.

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D11 Customer Relation Management System - D11 CRMS

This project addresses the critical challenge of managing the overwhelming flood of security alerts in modern SOC environments by creating a comprehensive home lab that integrates SOAR capabilities. A Security Operations Center (SOC) is a centralized unit responsible for monitoring, detecting, and responding to cybersecurity threats in real-time, combining people, processes, and technologies to protect organizational assets.With IBM's Cost of a Data Breach Report 2024 showing the financial sector faces the second-highest average breach cost ($4.8 million). Using Wazuh for security monitoring, TheHive for case management, and Shuffle for workflow automation, the lab will simulate real-world security operations while automating event collection, streamlining alerts, and enhancing incident response. The need stems from industry-wide challenges including alert fatigue, delayed responses, and the risk of fraud, data theft, and downtime that threaten customer trust and compliance. This unique learning platform bridges the gap between theoretical knowledge and practical application, preparing aspiring analysts for the complexities of professional security operations.

By Adnan Alhashemi

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Secure Web Application Deployment with VPN

The project addressed the need for secure and scalable web applications, enabling organizations to protect data and ensure reliable access. It developed a web application securely deployed on AWS, utilizing a Virtual Private Cloud (VPC) for controlled access and Site-to-Site VPN for encrypted communication. Key AWS services included EC2 for compute, RDS for database management, and WAF for protection against exploits. Elastic Load Balancer (ELB) and Route 53 optimized traffic distribution and DNS management. AWS CloudWatch and CloudTrail provided real-time monitoring. The system ensured secure access, minimized cyber risks, and offered a scalable solution for businesses to deploy applications safely in the cloud.

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Implementation of a Secure and Monitored Network with Site-to-Site VPN

A fully operational and secure network infrastructure was designed and implemented to ensure high availability, business continuity, and disaster recovery. The project was developed to provide a scalable, secure, and continuously monitored networking solution, enabling seamless and encrypted communication between multiple environments.The infrastructure consists of two main environments: Production and Disaster Recovery (DR). Each environment includes dedicated routers, which establish site-to-site VPN tunnels to a remote branch. OSPF was implemented for intra-AS routing, ensuring efficient communication within each network, while BGP was deployed for inter-AS routing, optimizing external network communication between different sites. Cisco ASA firewall is utilized to enforce advanced security policies and prevent unauthorized access. Zabbix and Grafana were integrated for real-time monitoring, logging, and alerting, ensuring proactive network management.
The project followed the industry's best practices to achieve scalability, security, and high availability, providing an enterprise-grade solution that ensures business continuity, enhanced security, and real-time monitoring.

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Cloud Infrastructure and API Development for Secure Document Sharing

The project consists of two parts, a cloud infrastructure and front-end development (Web application). The main part of the project is the cloud infrastructure that is built as new infrastructure as an enhancement in terms of security, performance, cost, scalability, reliability and availability. Moreover, it also deploys security cloud services that resolved issues such as API authentication, protection against attacks and so on.The second part of the project is the development of the web application, it is replaced the written documentation from a PDF to a modernized web application that provide many features like being only accessible through the partner dashboard, a testing ground for the API endpoint responses and behavior (Similar to Postman), being always up to date for the partners. In addition, the web application is hosted within the new infrastructure to test out its security and performance capabilities.

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Enhancing Network Security and Infrastructure at MULTI AGT

The Residential Employee Network project aims to modernize SKD Group's outdated network by designing a secure, scalable, and high-performance solution for its residential facilities. Key objectives include delivering reliable high-speed connectivity, enhancing security through firewalls, VPNs, and intrusion prevention systems, and implementing network segmentation using VLANs to separate employee, guest, and IoT traffic. The network will be scalable to accommodate future growth and integrated with Zabbix for real-time monitoring and issue detection. Benefits include improved employee productivity, robust data protection, enhanced user experience through QoS policies, and reduced upgrade costs. The project aligns with SKD Group's commitment to innovation, employee well-being, and operational excellence.

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MoW - Tunnel Flood Detection System

The Bahrain Ministry of Works (MoW) has launched TunnelGuard, an AI-powered flood prevention system built on AWS to eliminate flood-related incidents in road tunnels. Developed in collaboration with Tamkeen, IGA, UoB, and AWS, the system shifts from reactive warnings to proactive flood prevention. TunnelGuard uses AWS IoT Core, Amazon SageMaker, and Amazon Kinesis to predict flooding risks and trigger automated responses, such as activating drainage pumps and smart barriers. An AWS-powered dashboard provides real-time monitoring. Initial tests showed 100% success in preventing tunnel flooding, with 95% accuracy in predicting floods 60 minutes in advance. The initiative enhances public safety, reduces infrastructure damage, and minimizes emergency response costs.

By Ali Alhashemi

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BidTrust: The Algorithm to Assess Auction Bid Authenticity Using User Metrics

My project, BidTrust, was designed to ensure the legitimacy of bids made in an online marketplace and auction house called Siin. This legitimacy would be found out through the thorough analysis of different user metrics such as account age, bid history, and bidding patterns. BidTrust helps solve a lot of problems by preventing price manipulation and ensuring more transparency and fair competition. It also eases operations by assigning a legitimacy score so that ops may have a solution for fraudulent cases prior to an auction ending, making it so that they don't have to rush to a solution in the spur of the moment when a bid winner ends up illegitimate.

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Deployment and Configuration of an Intermediate Distribution Frame (IDF) for a Full-Floor in Bapco Energies

In order to serve the IT infrastructure of a recently built floor at Bapco Energies, the project required the deployment and setup of an Intermediate Distribution Frame (IDF). By strengthening network connectivity, boosting communication systems, and guaranteeing dependable power and security infrastructure, this project met the business need to support the company's growing activities. The IDF was intended to act as the main hub for telecom and networking technologies, enabling smooth communication and data flow across the floor. To build a strong infrastructure, the project included installing network switches, structured cabling, wireless access points, and IP phones with VoIP capabilities. To improve operating efficiency and security, access control mechanisms, environmental controls, and power backup systems were also put in place. Modern technology such fiber optic cable, Condeco conference room systems, Power over Ethernet (PoE) switches, and centralized network monitoring tools were used to accomplish the solution. The workplace was further enhanced with the addition of intelligent collaborative tools and thorough environmental monitoring. This IDF's implementation gave Bapco Energies a high-performance, scalable infrastructure that complemented the business's operational excellence and digital transformation objectives.

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Localized System Website with Redundant Backup for Enhanced Speed and Reliability

This project addressed the need for startups to mitigate latency and downtime risks associated with cloud-only website hosting. A hybrid system was implemented, featuring a mirrored website deployed on an on-premises server and synchronized with the cloud. To achieve this, technologies such as Ubuntu Server, Nginx, Cloudflare DNS failover, Veeam, Rclone, and the Elastic SIEM solution were utilized. The system incorporates automated failover and load balancing to ensure traffic redirection to the local server during cloud outages. This approach enhances website uptime, improves data security, and reduces latency for local users.

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Network Performance Monitoring System

This project focuses on developing a network performance monitoring system using Grafana. The system is designed to collect, analyze and display real time network performance metrics such as bandwidth usage, latency, or system uptime. By integrating grafana with datasources like mysql or prometheus, the solution provides an interactive dashboard that can assist IT Administrators in identifying network issues proactively.

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Bahrain Broadband Boost

The Bahrain Broadband Boost project aims to analyze and enhance Bahrain's fixed broadband internet performance. Despite ranking 5th globally in mobile internet speed, Bahrain lags at 68th for fixed broadband, affecting both users and businesses. This project will investigate speed trends, identify weak and strong coverage areas, and evaluate Bahrain's global ranking using Ookla's Speedtest data. Key objectives include improving download and upload speeds, reducing latency, and ensuring efficient network management. The project will employ network simulation, data analysis, and visualization tools to diagnose issues and propose strategic enhancements. By strengthening Bahrain's digital infrastructure, the project will contribute to a more competitive and reliable broadband network, benefiting users, ISPs, and the economy.

By Habib Hejair

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Secure Multi-Branch Network with VoIP and Firewall Integration

A secure and efficient multi-branch network has been created in order to improve the communication as well as the security across the Bahrain (HQ), Saudi, and Turkey branches of Midal Cables. The development project fulfilled the expanding business requirement for a secure network system that offered scalable connection between multiple offices and also ensured efficient centralized management.The network used MPLS technology to optimize WAN performance together with BGP routing for efficient route exchange between branches and OSPF for internal routing. High security communication between branches came from installing a FortiGate Next-Generation Firewall (NGFW) at the headquarters to filter and monitor network traffic. All branches benefited from VoIP communication through the deployment of Cisco Call Manager Express (CME) which enhanced collaboration across the network. The network control system was enabled by Windows Server Active Directory (AD) which provided both central authentication functions and device management capabilities. Each branch adopted VLAN segmentation as a tool to achieve better security measures and traffic performance.The main distinction of this project emerges from its security configurations for enterprises together with its VoIP communication scalability and its optimized routing protocols operating in a simulated enterprise network structure. A secure and efficient network infrastructure emerged from the unified deployment of MPLS, BGP, VLANs and centralized authentication system which addressed the growing needs of the business organization.

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Multi-Site Network Infrastructure and Automated Monitoring

A business with multiple locations cannot function without a reliable network and a seamless connection to the internet. It requires a well-developed network design to ensure availability, reliability, and security in the face of network vulnerabilities and failovers. The project resolves this problem by implementing a robust network design that offers secure and redundant measures between sites. The infrastructure integrated FortiGate firewalls, access controls, and encryption protocols to safeguard data traveling through the network. The solution also incorporated centralized management tools such as Meraki to simplify the process of monitoring and managing the wireless connections in the sites. Additionally, it offered optimization techniques through the automation scripts using Ansible. This feature helps administrators collect information on the network assets, create backups for redundancy, and proactively detect any failures in the network. All in all, the network infrastructure uniquely combines various networking technologies to improve the performance and security of the network while reducing the overall workload required to maintain the system.

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Securing WAN data using network security policies and protocols

The projects main focus is on network security, the project involves securing WAN (wide area network) of a corporate client connecting to multiple branches. The objective is to safeguard sensitive data that is being collected and transmitted between the branches. This project will ensure compliance and gain customers trust that all the data that will be collected will be secure and will aid for further expansion to European countries in the future as it will meet the compliance regulations. The project has implemented network security using features such as IPS/IDS along with the use of ASA and encryption with scalability using VPNs, PBR was also configured, Resulting in a secure, scalable and highly available WAN connection.

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The Benefit AWS Direct Connect Project

Benefit Bahrain, a leader in financial technology in the Kingdom of Bahrain, aims to enhance its cloud infrastructure for secure and scalable digital banking operations. The project focuses on implementing AWS Direct Connect, which offers dedicated network access with low latency and high reliability. This initiative establishes private connectivity between Benefit Bahrain's on-premises infrastructure, AWS Cloud, and the National Banks of Bahrain. Key objectives include improving security for financial data exchange, ensuring seamless integration with existing systems, and enhancing network performance to support future business growth. By leveraging AWS Direct Connect, Benefit Bahrain ensures robust and scalable infrastructure to drive its digital transformation and innovation in electronic payments and financial services.

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Testing Grounds

A complete yet theorized infrastructure focuses on NCSC's best practices on Windows 2025 servers, availability through failover, redundancy through double wiring, duplicate routers, standby firewalls, and security through set firewalls at each customer router.

By Jawaher Alshanoo

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Grievance Management System

The system will replace the legacy Java-based grievance system with a cloud-hosted Mendix platform. It will enable citizens to submit and track complaints (e.g., building permits, urban planning) online, while municipal staff gain tools for automated workflows, real-time reporting, and analytics.

By Israa Adeeb

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Ministry of Information

Update the Infrastructure of the Ministry of Information

The project focuses on upgrading the Ministry of Information's outdated network infrastructure to enhance scalability, security, and efficiency. Key tasks included replacing Huawei and Dell switches with Cisco switches, implementing Cisco ISE for network security, and converging configurations across devices. A new topology will be designed and tested using EVE-NG. The upgrade introduced advanced features like VLAN segmentation and redundancy for robust security. The project aimed to improve data management, ensure compliance, and support future growth. Benefits included increased operational efficiency, enhanced security, and a scalable infrastructure, enabling the Ministry to better serve stakeholders and adapt to evolving technological demands.

By Aesha Mohamed

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IT Support and Maintenance for the Shura Council

During my training at the Shura Council's IT Department, I will manage the internal SharePoint website, ensuring smooth operation and user efficiency. I will handle staff requests, troubleshoot issues, optimize workflows, and assist IT staff with various tasks. This experience will strengthen my technical skills in a legislative setting.

By Mahmood Bahra

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Isolated Secure Trainee Lab

GPIC needs an isolated training environment where trainees can execute their tasks securely without entering company system data or accessing crucial data. Security breaches together with unauthorized access could occur if trainees work without isolation. Trainees can perform their tasks on an isolated trainee PC that maintains separation from business operations. Network segmentation with security policies will be developed to stop trainee PC access to restricted company resources. The network isolation will be enforced through FortiGate Firewall and Windows Server (GPOs) will establish rules for blocked access. Real-time trainee activity monitoring will be enabled through FortiAnalyzer to verify that security policies remain followed. Specific websites will be blocked for the trainee PC to reduce security breaches and unauthorized access. The proposed solution delivers an organized training space which ensures security through complete trainee oversight despite limiting disruptions. The implementation of real-time monitoring together with controlled internet access and network isolation will improve GPIC's cybersecurity structure and deliver secure training infrastructure to trainees. The implementation of this project will provide trainees with a protected space to learn technical abilities through controlled IT network conditions.

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Implementation and Setup of IDF Network Infrastructure for an entire floor

To support its expanding digital operations, Bapco Energies is designing and building an innovative Intermediate Distribution Frame (IDF) data centre as part of a crucial infrastructure update. On a newly built floor, this project will set up a high-performance, secure, and scalable network infrastructure, guaranteeing seamless connectivity for IT services, telephony, and business-critical applications. In order to support mission-critical services like workplace applications, VoIP communications, and wireless networking, the IDF will serve as a central networking hub, optimising data transmission efficiency, reducing latency, and offering redundant, fast connectivity. To improve security, dependability, and operational efficiency, PoE-enabled infrastructure, enterprise-grade firewalls, high-speed routers, and Layer 2 and Layer 3 switches will be installed. The infrastructure will incorporate enterprise security controls, structured cabling, redundant power solutions, and environmental monitoring to ensure adherence to industry best practices and avoid data breaches and outages. Bapco Energies solidifies its position as a leader in technical innovation by future-proofing its network with scalable architecture, improved security, and optimised performance, guaranteeing a strong basis for long-term digital transformation and operational excellence.

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Network Infrastructure Upgrade for D11 Gaming Hub

The D11 Gaming Hub's network infrastructure was upgraded to improve security, scalability, and dependability. Because it lacked redundancy and struggled with increasing traffic volumes, the current network infrastructure needed more robust security measures. These challenges resulted in network bottlenecks, service disruptions, and vulnerabilities that could impact user experience and business operations.To solve these problems, the project redesigned the network using improved security protocols, redundancy measures, and scalable solutions. The deployment of high-performance networking equipment ensured smooth gaming sessions with faster and lower latency. Downtime was avoided by integrating dual ISP connections with failover methods, and bandwidth distribution was optimized by load balancing.Cisco ASA Firewalls and Virtual Private Network (VPN) solutions were deployed to improve security, hardening the network from intrusions and illegal access. While a centralized network monitoring system offered real-time tracking and proactive issue resolution, VLAN segmentation made sure that traffic was managed effectively.The enhanced infrastructure offered a constant secure and fast gaming experience while also greatly enhancing network performance and reducing interruptions. Through network futureproofing, the project helped D11 Gaming Hub expand, enabling it to serve more users and keep its competitive advantage in the gaming industry.

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Project Management System

This project focuses on developing a centralized Project Management System for the Ministry of Municipalities Affairs and Agriculture in Bahrain. The system aims to streamline project planning, execution, and monitoring by replacing fragmented processes with a unified platform.

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Malware Detecting System

The project addressed the need for a proactive malware detection system to protect sensitive data and IT infrastructure. Traditional security measures often fail to detect advanced threats, leading to data breaches.The system integrated IBM QRadar SIEM with a Network Access Control (NAC) system to detect and mitigate malware in real time. QRadar analyzed network traffic and identified threats, while NAC enforced access restrictions to prevent the spread of malware. By leveraging security analytics, the system provided real-time threat detection, automated response, and network isolation for compromised devices. This approach enhanced cybersecurity by improving incident response time and reducing the risk of infections.

By Maryam Alhubail

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Aruba

The project involves transitioning our network infrastructure from Cisco systems to Aruba (HP) solutions. This shift is driven by the need to enhance our wireless capabilities, improve network performance, and provide a more user-friendly experience for both staff and guests. Historically, our reliance on Cisco has served us well; however, as our organization grows, the limitations of the current system have become apparent. Aruba's advanced technology offers innovative features that align with our evolving needs, making this transition a strategic imperative.

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Design, Implementation, and Command Configuration of an IDF on a Single Floor in Bapco energies

An Intermediate Distribution Frame (IDF) was designed, implemented, and configured as part of the project to improve Bapco Energies' single-story IT infrastructure. In order to support the company's expanding activities, this effort addressed the business requirement to offer dependable infrastructure, effective communication, and seamless connection. With the addition of network switches, fiber optic cable, wireless access points, and IP phones, the IDF was intended to serve as a centralized network point. To maximize network performance and provide priority to important traffic, the implementation involved setting up VLANs, Power over Ethernet (PoE) devices, and Quality of Service (QoS) regulations. Data transmission over the floor was made safe, scalable, and effective via the command configuration procedure.To improve cooperation and operational effectiveness, technologies including Condeco conference room equipment, VoIP systems, and centralized network monitoring tools were incorporated. Bapco Energies has a future-proof infrastructure thanks to the IDF's scalable design, which complements the business's goals for digital transformation and dedication to technical advancement. Better resource control throughout the office floor was made possible by the implementation, which also decreased latency and increased network dependability. Future expansions were also taken into consideration in the design, which made it simpler to include new gadgets and technologies without requiring significant configuration changes.

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Test Call Generator (TCG)

A Test Call Generator (TCG) is a system designed to simulate real customer interactions by generating test calls, SMS, and data sessions to verify network performance, billing accuracy, and service quality. It consists of a test call unit, a SIM server. The system places test calls using real SIMs, routing them through the telecom network like actual customer calls. It then captures Call Detail Records (CDRs) and compares them against expected charges based on published tariffs. Any discrepancies, such as overcharges, missing records, or incorrect billing, are flagged for investigation. This process ensures accurate metering, fraud detection, and revenue assurance, helping telecom operators like Batelco maintain customer trust and compliance.

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TunnelGuard

Built on AWS cloud infrastructure, TunnelGuard, a sophisticated artificial intelligence-powered flood prevention system designed to safeguard citizens from flash floods in road tunnels. This pioneering solution represents a significant advancement beyond traditional warning systems by proactively preventing flooding incidents before they materialize. The system utilizes IoT sensors, machine learning models, and automated responses like drainage pumps and smart barriers to address flooding risks. During initial testing, it demonstrated 100% effectiveness in one Manama tunnel and can predict potential flooding up to 60 minutes in advance with 95% accuracy. The system aims to ensure continuous traffic flow, reduce emergency response costs, and protect infrastructure investments, transforming tunnel safety standards across Bahrain.

By Mohamed Ali

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New network infrastructure

The project I will be working on is providing a new network infrastructure for a new ministry branch to join the government data network (GDN), this new network must be secure and efficient and up to the government data network standards (GDN).
•Objectives: Providing a new stable and secure network for a new ministry branch. The network should be secure and provided with all requirements that follow the Bahrain law and standards. Lastly the network will be able to communicate and establish connections internally and with all other ministries if needed.
•Benefits: providing a new and secure network to join the government data network (GDN), which will allow for faster connection, access government services, safe and secure direct connection lastly the network will be supported by the Information and egovernment authority (IGA).

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Costumer Inquiry System

The Customer Inquiry System for the Bahrain Ministry of Municipalities Affairs and Agriculture is a cloud-based platform designed to modernize the management of municipal service requests. This system streamlines the process by allowing municipal councils to submit, track, and follow up on inquiries from individuals and businesses, improving coordination with the Ministry's departments. Currently, inquiries are handled via email, causing delays and inefficiencies. By implementing a centralized digital solution, the system enhances request management, optimizes response times, and ensures better follow-ups. My role focuses on designing and developing this platform to facilitate seamless communication and efficient municipal service delivery. This project requires review and approval by the Industry Mentor and CLP Supervisor before submission.

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Optimizing Network Architecture with SD-WAN

This project focuses on optimizing AJM Kooheji Group's network by transitioning from an MPLS-based architecture to an SD-WAN solution. The goal is to enhance connectivity, reduce costs, and improve the performance of Microsoft 365 and Microsoft Dynamics ERP. The current network faces challenges such as high costs, latency, and service disruptions. By implementing Cisco Viptela SD-WAN, the project aims to introduce direct cloud access, traffic optimization, and redundancy through dual internet connections. Security will be strengthened using encryption, firewalls, and VPNs. The project involves network analysis, SD-WAN design, configuration, and performance testing, ultimately delivering a cost-effective, scalable, and secure network infrastructure.

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IP Address Management (IPAM) System

The manual process of assigning and tracking IP addresses within BNET's fiber network infrastructure was inefficient, error-prone, and lacked oversight. The project introduced an automated, cloud based - IP Address Management (IPAM) system to streamline request handling and improve resource allocation. The system enabled employees to formally request IP addresses through a web portal, with an approval workflow for managerial review. It also maintained a centralized database for logging IP actions, ensuring accountability and transparency. Built on AWS services, the solution utilized a cloud-based backend, a simple web interface, and role-based access control. This improved efficiency, reduced errors, and enhanced scalability while maintaining compliance with company policies on IP management.

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Development of a Parking Entrance Ticketing System

The aim of this project is to create an Entrance Ticketing system using modern approaches to simplify the ticketing process. All the ticketing functions will be integrated in a single platform like online reservations, ticket purchases at the venue, access control, and tracking the visitor data. It will help make better operational decisions, provide visitors with better experience, and supply admins with real time information and analytics. Also, the system will work with computers and mobile devices and will enable visitors to buy tickets and enter the venue with ease.

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Project Management System

The Project Management System is a cloud-based platform designed for the Ministry of Municipalities Affairs and Agriculture to enhance project planning, execution, monitoring, and reporting. Currently, project management processes are fragmented, leading to inefficiencies and a lack of real-time visibility. This system will centralize all project-related activities, ensuring seamless collaboration, resource optimization, and data-driven decision-making.Developed using the Mendix Low-Code platform, the system will feature interactive dashboards, task automation, predictive analytics, and role-based access controls. It will be accessible on both web and mobile devices, ensuring flexibility and scalability. This initiative aims to streamline workflows, improve efficiency, and support the ministry's digital transformation efforts.

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SARA - Smart Autonomous Remediation Automation

SARA is a self-healing network automation system designed to detect and resolve common network issues like interface failures, route table misconfigurations, and VLAN errors. The system leverages a network monitoring tool to track all interfaces and ports, ensuring the correct configurations are applied. It acts as the first line of defense, continuously monitoring the network and triggering automation scripts to fix issues before they impact operations.

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Network Enhancement and Real-Time Monitoring

The project focused on fulfilling the company's need for enhancing its network management and monitoring within its infrastructure. It faced significant challenges in maintaining its network performance and resource utilization due to the wide range of services it provides. The lack of having a monitoring system to observe the network performance resulted in inefficiencies in network management. Additionally, the project aimed to enhance the network by providing a fault-tolerant design which fulfills the company's needs in having a highly available and reliable network. The project utilized a comprehensive network monitoring system within a newly designed network for the company, allowing the IT team to gain real-time insights into their network and keep track of their resource utilization. It also helped the administrators to address potential issues into their network and proactively take the necessary actions to solve them. The new network design also enhanced the overall network performance as it involved many features such as redundancy, reliability, scalability and security. The deployed monitoring system was capable to integrate with the existing company network system, providing real-time statistics and live tracking of the traffic in the network. It provided a structured process in managing the network and the company's resources. Lastly, the new network design addressed the company need in having a fault-tolerant network by providing redundant paths for their traffic.

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Implementation of Nagios Core for Efficient Network Monitoring and Security Assessment in Al Ahlia University

This project will deploy Nagios Core on a VirtualBox-hosted AlmaLinux system to monitor network devices such as routers, switches, and servers. The project will include integrating security tools for live host discovery, port scanning, vulnerability detection, and security alerts.
Objectives:
•Deploy and configure Nagios Core on AlmaLinux.
•Monitor network devices including routers, switches, and servers.
•Set up alerting mechanisms for critical network events.
•Automate live host discovery using Nmap scans.
•Integrate security tools like Nikto and OpenVAS for vulnerability scanning.
•Customize the Nagios dashboard for enhanced visualization and user experience.

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Bahrain Ministry of Works- AI Powered Flood Prevention System

The Bahrain Ministry of Works (MOW) has introduced TunnelGuard, an AI-driven flood prevention system aimed at eliminating flood-related incidents in road tunnels. Developed in collaboration with Tamkeen, IGA, UoB, and AWS, the system uses AWS IoT Core, SageMaker, and Kinesis to predict and prevent flooding before it occurs. It automates responses through smart barriers and drainage pumps, ensuring real-time safety measures. Initial testing in Manama showed 100% effectiveness, with predictions up to 60 minutes in advance. TunnelGuard enhances public safety, reduces infrastructure damage, and improves emergency response efficiency, setting a regional benchmark for flood management.

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Comparative Analysis of OpenSource SIEM Tools for Cybersecurity

With the increasing frequency and complexity of cyber threats, organizations require efficient Security Information and Event Management (SIEM) solutions to detect and respond to security incidents effectively.This project addressed the need for a cost-effective and reliable open-source SIEM solution by evaluating and comparing two widely used tools. The project involved deploying and configuring two open-source SIEM tools in a controlled environment, followed by the execution of multiple cyber-attack scenarios, such as brute force attacks, port scanning,malware injections, and privilege escalation attempts. These attack simulations tested the tools capabilities in threat detection, log analysis, and real-time alerting.The comparative analysis was conducted based on detection accuracy, performance, scalability, ease of use, and reporting capabilities. The evaluation provided insights into the strengths and weaknesses of each tool, helping organizations make informed decisions when selecting an open-source SIEM solution. The project's uniqueness lies in its real-world attack simulations and data-driven evaluation, offering a practical guide for organizations seeking an open-source alternative to commercial SIEM solutions.

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HRM System

My project focuses on enhancing the functionality and efficiency of our Human Resource Management (HRM) system by optimizing data handling and reporting processes. Specifically, I am developing and refining queries to extract and analyze employee information, ensuring that data management aligns with compliance standards and best practices. This project aims to improve access to critical HR data, streamline reporting, and support decision-making processes while maintaining the highest levels of data security and privacy. By working closely with my team and stakeholders, I intend to implement enhancements that will lead to more effective HR operations and ultimately contribute to a more efficient organizational workflow.

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Insurance Agent Portal

The project aimed to address the need for improving the broker experience at Solidarity Bahrain by enhancing the Agent Portal. The existing portal had limitations in accessibility, communication, and policy management, which impacted efficiency and service delivery. This project created an additional layer on top of the existing portal, unifying the login system with OTP authentication, integrating key systems, and offering features like report generation, document access, and policy payment status tracking. These improvements streamlined the broker's workflow, reducing turnaround time for policy renewals and enhancing communication between brokers and Solidarity Bahrain. Technologies like React.js for frontend development, ASP.NET for backend services, and Optical Scan Recognition (OSR) for automated ID scanning were implemented to ensure the portal's effectiveness. The solution also addressed security and data privacy concerns with OAuth 2.0, JWT authentication, and compliance with Bahrain's data protection laws. The uniqueness of the product lies in the seamless integration of multiple systems into a single interface, improving overall efficiency and user experience for insurance brokers.

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The Ministry of Municipalities Affairs and Agriculture Inquiry Management System

The Inquiry Management System is a cloud-based solution for inquiry submission and monitoring, allowing the ministry to manage requests smoothly. Through the system, all inquiries were centralized and routed to the appropriate destination, enabling real-time status updates, notifications, and intelligent insights.
The system was developed using Mendix, a low-code platform that facilitates rapid deployment and easy customization, allowing it to be accessed via different devices and browsers. Moreover, PostgreSQL was used as a database to provide efficient data storage, retrieval, and control with the capability of handling large amounts of data. Thus, Through the elimination of manual inefficiencies, it can enhace service delivery and set new standards for smart governance and innovation in the public sector.

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Garden Entrance Ticketing System

The Ministry of Municipalities Affairs and Agriculture (MOMAA) is a governmental organization that is responsible for several works such as urban planning, public infrastructure, municipal services, and agriculture development. Besides that, the ministry manages and improves parks to provide perfect experience for visitors. As a database student, I work with the IT team to help with designing, managing, and optimizing the databases for the ministry. Some of the parks currently depend on manual processes for ticketing as those parks require entrance fees, and the collection of these fees causes a number of problems such as long queues, delayed entry, and poor visitor experience. Another issue is related with missing revenue reports and inconsistent collection techniques across different parks. So to deal with these issues, developing a cloud-based Entrance Ticketing System will be a comprehensive solution to centralize all aspects of ticketing.

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Automated Penetration Testing Tool

This project focuses on developing an Automated Penetration Testing Tool to help organizations identify and mitigate security vulnerabilities. The tool will perform automated scans, exploit detection, and security assessments, providing detailed reports on potential threats. Designed with user-friendliness in mind, it will integrate advanced cybersecurity techniques to assist IT teams in strengthening their systems. The project is being developed in collaboration with Y.K. Almoayyed International Group and aligns with industry standards to ensure real-world applicability. By automating security testing, the tool will enhance efficiency and accuracy, reducing manual efforts while improving threat detection. This initiative aims to contribute to a safer digital environment by making penetration testing more accessible and effective.

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TunnelGuard

Flash flooding in Bahrain's road tunnels posed significant risks to public safety due to the reliance on manual monitoring and fragmented communication. The existing system, dependent on emails and WhatsApp messages, resulted in delayed response times, increasing the likelihood of infrastructure damage and accidents. Addressing this issue was critical to ensuring safer and more efficient flood management in urban areas. The project developed TunnelGuard, an AI-powered flood prevention system that proactively predicts and mitigates tunnel flooding. By integrating IoT sensors, real-time data processing, and machine learning models, the system provided early warnings and automated response mechanisms. The implementation of smart barriers and pump activation further enhanced flood control measures, minimizing risks before emergencies occurred. The system leveraged AWS cloud technologies, including IoT Core for sensor management, SageMaker for predictive analytics, Kinesis for real-time data streaming, EventBridge for automated alerts, and QuickSight for monitoring dashboards. These technologies ensured scalable, secure, and reliable flood prevention.

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Optimizing Bahrain's Energy Mix for Sustainability and Net-Zero Goals

This project addresses Bahrain's critical challenge of transitioning from fossil fuel dependence to meet its renewable energy targets and net-zero emissions commitment. It will develop an optimized energy mix, prioritizing energy security, economic viability, and environmental sustainability. The project's core objectives are to facilitate the effective integration of renewable energy sources, minimize carbon emissions, ensure grid stability, and maintain affordable energy access. A robust methodology, encompassing comprehensive data acquisition, rigorous data refinement, sophisticated analysis, and detailed reporting, will be employed. The project's outcome will provide a strategic roadmap for Bahrain's sustainable energy future, aligning with its national development goals.

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Banking AI Chatbot

Traditional banking support often results in long wait times and increased workload for customer service teams. To enhance efficiency, an AI-powered chatbot was developed to provide instant, secure, and accurate responses to banking inquiries. The chatbot automates customer support, offers 24/7 availability, and assists users with common banking tasks. Built with Mendix Studio Pro and Amazon Bedrock, it integrates seamlessly with banking applications via REST APIs while ensuring data protection through OAuth 2.0 authentication. Unlike traditional chatbots, this solution provided scalability, compliance with banking security standards, and easy deployment within existing banking applications. Its ability to handle multiple customer inquiries simultaneously while reducing operational costs made it an efficient and innovative tool for modern banking services.

By Eman Bareh, Maryam Aleskafi, Dana Alaskari, Ali Fardan, Hasan Mohamed, Yousif Alhawaj

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Array Innovation

ARRAY INNOVATION is dedicated to positioning Bahrain as a regional Technology Hub by empowering local talent with the skills and knowledge needed to thrive in the tech industry. As part of this mission, the Array World application serves as a gateway to the cutting-edge research and innovations developed by ARRAY's R&D team. Array World is a unified digital platform that seamlessly combines content management, user engagement, and recruitment functionalities. The ecosystem includes a mobile application and a web-based portal for publications and administration. Built on a scalable cloud architecture, the system incorporates AI-powered content recommendations and robust role-based access controls to deliver secure, personalized user experiences. Key features include access to research articles and videos, interactive quizzes, gamified engagement (points, badges, and leaderboards), resume uploads, and a dedicated job portal. The technology stack includes TypeScript, React, Java, Spring, MySQL, Redis, and more. As Array World continues to evolve, additional modules will be introduced to further its mission and provide value to users and clients alike.

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NFVI (network function virtual infrastructure)

We are going to be joining in migration from NFVI version 6 to 7 along with making sure all is running smoothly.

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Advanced Network Simulation for STC: Connectivity, Security, and Efficiency

Secure connectivity, along with effective communication, represents essential foundation elements for STC Group because of its large-scale operations, which operate across multiple sites. As a result, STC Group needed a flexible yet secure network platform with high-performance capabilities, making it the focal point of this project. To achieve this, STC Bahrain used the performance network to connect with Channels by STC and Channels KSA while also ensuring redundancy and optimized resource sharing. In this setup, security features, redundancy, and resource optimization all work together seamlessly. A fully designed network infrastructure was delivered, with VLAN features as its main component, alongside segmentation, firewall security policies, and high-availability configurations. Furthermore, real-life network simulations became possible through the implementation of Cisco routers, switches, and ASA firewalls within the EVE-NG framework. Additionally, Virtual Private Network connections at different site locations guaranteed safe network communication between sites. To assess performance, network monitoring applications were applied.The network implements three advanced systems, including inter-VLAN routing, OSPF dynamic routing, and an Active/Standby firewall configuration. Specifically, the Active/Standby firewall setup, combined with a failover mechanism, functions as an automatic fail-safe system while minimizing system downtime. As a result, enterprise network operations received a realistic simulation, increasing its application potential and making deployment more feasible. The design approach adopted in this project moves away from traditional static network designs, instead establishing a scalable, security-oriented system. Because of this, the proposed solution demonstrates its ability to scale up in line with future business growth plans. Moreover, active network defences are illustrated throughout this solution. Finally, the security design incorporates network security measures that coexist with operational efficiency and system availability, all while enhancing centralized administration across multiple locations.

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Array Innovation - CRM

ARRAY Innovation has worked on numerous projects and collaborated with various clients. As a result, it recognized the need for an organized system to effectively oversee all sales operations, including projects, clients, contacts, and any activity that advances throughout the process. To meet this demand, ARRAY requested an advanced Customer Relationship Management system that ensures enhanced and optimized user experience. A dedicated team of five students, each possessing extensive knowledge and experience in software engineering and system development, leveraged the power of Laravel, a PHP framework known for simplifying web development, enhancing security, and streamlining the building process. The team met with employees and business analysts to understand the requirements and the vision for this project and was able to build a solution that satisfies the need. This project stands out as a transformative solution that, once deployed, will serve as a crucial tool for many employees at ARRAY. It revolutionizes the scattered sales and client management processes by creating a centralized, efficient, and secure system. This will not only streamline operations but also ensure automatic tracking, ultimately enhancing productivity and effectiveness across the organization.

Organizing Committee

ICT Project Expo 2025
Faculty of ICT , Bahrain Polytechnic

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