



Muteki Group

Muteki Group

2023



Muteki Group

Who We Are & What We Do

Muteki Group is a software development company founded in Ukraine and expanded to Europe and Japan

Since 2015 we specialize in providing innovative tech-savvy solutions for startups and established businesses.

Our core offering is AI based web and mobile applications and custom RnD projects in different business domains including but not limited to retail, fashion, healthcare, recycling, logistics, construction and other. We are focused on game-changing performance level by taking the best of AWS, Microsoft Azure, and Google Cloud for your business.



100+

projects

80+

experts

AI

R&D center

Software expertise:

- Artificial Intelligence,
- Machine Learning, Deep Learning,
- NN,
- Face recognition, OCR
- Computer Vision,
- NLP,
- Big Data,
- Audio ML,
- Image/ Video processing,
- DSP

Hardware expertise:

- Design of prototypes and products
- Integrating AI capability with sensors and camera
- Electronic circuit design
- Computer and devices network design
- Video / Photographic volumetric capture system design

Frameworks and Algorithms:

OpenCV, Keras, Matlab, Tensorflow, RandomForest, Darknet, DLib, PyTorch, Matplotlib, Cassander, Tesseract, Seaborn, Scikit-image, Scikit-learn, SpaCy, NumPy, TFX, skimage, XGBoost, CatBoost, sklearn, auto-sklearn, NLTK, aiohttp, Torch, thinc, Pandas, HOG, OpenGL, fastText, RetinaFace, ArcFace, Yolo, BERT, GPT2, mxnet, ResNet, MobileNet, mlxtend, CNN, Imblearn, Spark, Hadoop, Glue, Flask, RNN, GATE, stanza, Hyperopt, Bash, Django, PIL, xmltodict, Redis, Librosa, Wave2vec, PySpark, CNN-RNN-CTC, Milvus, RoBERTa, Efficientnet, Convnext, CNN-RNN-CTC

Languages/Frameworks:

C, C++, Python, .NET, C#, R, SQL, Java, Delphi, JavaScript, TypeScript, React.js, Angular.js., Vue.js., PHP, Laravel, Symfony

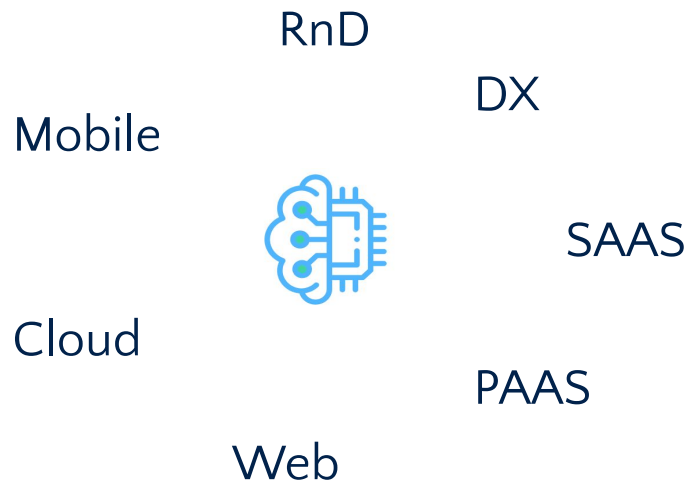
Databases:

SQLite, DynamoDB, Postgres, PostgreSQL, MongoDB, PL-SQL, Oracle, T-SQL, Apache Cassandra, MS SQL, Firebird

Cloud services:

AWS (Amazon Web Services), Sagemaker, S3, Amazon RDS (Relational Database Services), Aurora, Amazon Lambda, Amazon Cognito, Amazon SNS (Simple Notification Service), Amazon Kinesis, Dynamo DB, Amazon SQS (Simple Queue Service), AWS Athena, AWS Amplify, AWS RedShift, AWS Glue, AWS CloudFormation, Amazon Comprehend, Amazon Elastic Container Service, Building and Orchestrating ETL Pipelines by Using Athena and Step Functions, Amazon Rekognition, Amazon Ground Truth, Amazon Polly, Amazon Forecast, Amazon Lex - Create a chatbot, GCP, Azure

Key Expertise



Business domains



Retail



Logistics



Healthcare



Meditation



E-Commerce



Biotech



E-learning



Recycling



Travel
& Booking



Media

Technical domains

- Artificial Intelligence
- Machine Learning
- Deep Learning
- NN
- Face recognition
- OCR

- Computer Vision
- NLP
- Big Data
- Audio ML
- Image/ Video processing
- DSP



| Where We Can Help

ENGINEERING TEAMS

- Angular
- React.js
- Vue.js
- Node.js
- .NET
- PHP
- Python
- iOS
- Android

INNOVATION TEAM

- AI & ML
- CV
- NLP
- IoT



CLIENT SUPPORT TEAMS

- Account managers
- Legal advisers
- Recruiters
- HR team
- IT infrastructure
- Quality process manager

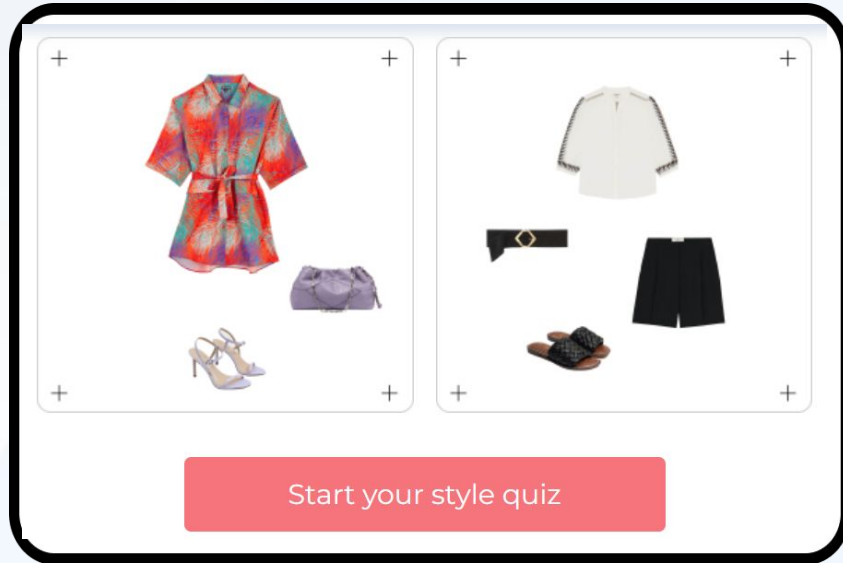
PRODUCT SUPPORT TEAMS

- Solution architects
- Delivery managers
- Business analysts
- Project managers
- Designers

Case studies



Muteki Group



DRESOS

AI-powered solution that provides personalized shopping experience

#fashion

#AI

Client

A Dubai based company in fashion retail that provides personalized outfits at scale.



Problem

Fashion retail, both physical and online has hardly any personalization and uses very little data and technology when offering products. At the same time, over 70% of consumers expect personalized shopping experience. We want to offer personalization and at the same time the shopping convenience for people that don't like shopping or don't have time for it.

Solution

Muteki Group developed a web platform and AI solution to offer personalized outfits for every consumer taking into consideration their preferences in terms of style, fit, size, price and many other data points. All that without any risk for the end consumer with try before you buy model.

We empowered the product by adding 3D body scanner that creates realistic avatars of customers. After the final release a User will have possibility to use virtual fitting room and try suggested outfits on his personal avatar online.

Result

Muteki Group developed a scalable system using AWS services. Our AI solution analyses 100 data points and suggests outfits for customers taking into consideration their preferences, previous purchases and matching them with latest fashion trends. The system can generate hundreds of outfits in several minutes.

Technologies

Artificial Intelligence, Machine Learning, PHP, React, AWS Lambda, S3, Sagemaker, Personalize, Kinesis Data, Docker, Kubernetes



Muteki Group



Cutting-Edge Automotive Simulator Platform

#Automotive

#Unity

Client

A USA-based software development company specializing in the development of project management systems, content management systems, and code review tools.



Problem

Client aimed to create a cutting-edge automotive simulator platform that provided a high-fidelity and immersive driving experience for educational and entertainment purposes. This platform needed to support a range of features, including real-time motion capture, sensor data collection, multimedia integration, and synchronization of motion and multimedia content.

Solution

The Automotive Simulator Platform was designed to address this problem. It leveraged advanced technologies and the Unity game engine to create a realistic driving experience with accurate physics, vehicle dynamics, and high-quality graphics and visual effects. It incorporated motion capture and sensor technologies to capture real-time vehicle data and sync multimedia content, including video and audio, with motion events. The platform ensured compatibility with various devices and platforms, from racing simulators to mobile phones.

Result

The project successfully delivered a highly immersive driving experience for educational and entertainment purposes. Users provided positive feedback, emphasizing the simulator's realism and effectiveness in improving driving skills. High levels of user engagement and satisfaction were observed, with smooth performance and compatibility across various devices and platforms, making the simulator accessible and user-friendly.

Technologies

Unity game engine for realistic physics, vehicle dynamics, and high-quality graphics. Motion capture and sensor technologies were incorporated for real-time vehicle data capture, while multimedia content synchronization was achieved using standard video codecs with metadata extensions. Compatibility across different devices and platforms was ensured through flexible development and optimization. The platform was designed to work seamlessly on a variety of systems, including PCs, mobile devices, and specialized racing simulators.



Muteki Group



Advanced Image Protection Software

#DSP

#image

Client

A technology company specializing in image protection and security.



Problem

The increasing prevalence of image abuse, leakage, and impersonation posed significant challenges for individuals and businesses. Existing solutions often fell short in detecting and preventing these issues, leaving images vulnerable to misuse and unauthorized access. There was a need for a more advanced and comprehensive image protection software.

Solution

Our solution involved the development of cutting-edge algorithms and techniques for image analysis and protection. We utilized digital signal processing (DSP) algorithms, machine learning (ML) models, and artificial intelligence (AI) techniques. Advanced image recognition and watermarking techniques were employed to identify copyrighted images and trace their usage. We also implemented secure encryption and access control mechanisms to safeguard images from unauthorized access.

Result

The result was a robust image protection software that empowered individuals and companies to safeguard their valuable images. It provided comprehensive protection against image abuse, leakage, and unauthorized access. The software offered features such as image recognition, watermarking, encryption, and access control, ensuring the utmost security for digital images.

Technologies

We utilized programming languages such as Python, C++, MATLAB, and R. Libraries and packages like NumPy, SciPy, MATLAB's Signal Processing Toolbox, and wavelet transform packages (e.g., PyWavelets, MATLAB's Wavelet Toolbox) were used.



Muteki Group



Comprehensive 3D Scanning and AR Services for Metaverse

#3Dscanner

#Mutekigroup

Client

Muteki Group (our product). 3D scanner solution that creates personalized real-looking avatars.

Problem

Our task was to create a 3D scanner that would provide high-quality, realistic 3D images of objects, people, places.

Solution

We started studying VR headset and Photogrammetry capabilities using platform such as Unity and Unreal to create contents accessible from the internet during lockdown. We also researched 360 and AR possible applications.

Result

We have now a great service offer to address the Metaverse.

1. 3D scanning services

We scan people, objects, places and buildings all over Japan onsite or in our 3D studio.

1. 3D and AR Website

We integrate 3D and AR in your website for your customers to enjoy fully your product.

1. Avatar digital twin

We create your realistic animated avatar to use in the Metaverse.

1. AR name card and advertisement

We create augmented cards and flyers using AR and 3D.

Technologies

AI, iOS, Android



Muteki Group



AI-Powered Fish Farm Monitoring for Stress Reduction and Health Analysis

#Deeplearning

#ML/AI

Client

The multicultural, innovation-driven agri-tech company based in Germany.



Problem

The main task was to reduce the stress level for the fish, so that instead of pulling the fish out, weighing it, inspecting it, the employee could simply take a photo with a special light, and the application itself analyzed the data by appearance. An analysis of the condition helps to determine whether the weight is normal, whether it is worth changing the diet, in what condition the scales, fins, etc.

Solution

AI-based fish farm monitoring software works via an underwater camera. By keeping track of the whole tanks' data, helps achieve your optimal growth strategy while ensuring a healthier fish population.

Result

By empowering better, more precise decision-making, digital assistant improves the overall production stability, enhances efficiency and enables you to control the farm to suit your growth plan.

Technologies

Machine learning (DT, Random Forest, XG Boost, Ada Boost, KNN, Naive Bayes, Support Vector Machine, K-Means, PCA),
Deep Learning (CNN, RNN, LSTM, GRU, Transfer Learning, YOLO, R-CNN, FasterR-CNN, Image Processing)



Muteki Group



AI solution for analyzing biomedical research articles

#Healthcare

#ML/AI

Client

Global B2B SaaS company that offers an AI-powered automation platform and services in 50+ countries.



Problem

The problem was that the amount of research being published was increasing rapidly, and manually analyzing and extracting key information was time-consuming and error-prone. Our solution was to develop an AI-powered system that could automate the analysis process and provide more accurate and efficient results.

Solution

Our team of experts developed a deep learning and natural language processing (NLP) system that could extract important terms from the articles, establish relations between them, and create a summary and knowledge graph of connected terms. The system uses advanced NLP techniques, including Biobert and Scispacy, to accurately analyze the biomedical text.

Result

The result was a predictive system that could accurately analyze doctor notations
determine whether a patient should be included or excluded from a medical program
ML techniques implemented in the system can predict a patient's readmission during the 30-day period
allow medical professionals to make informed decisions about patient care

Technologies

MongoDB, PyTorch, Python, Tensorflow, Biopython, Scispacy, Biobert, Google Cloud platform



Muteki Group



Predictive system for medical program inclusion based on doctor notations

#Healthcare

#ML/AI

Client

Medical Institution



Problem

The challenge was that the doctor notations were in text format, making it difficult to extract relevant information. Our solution was built on NLP system using Bert models that could transform the textual data into numerical vectors and identify relevant features for inclusion in the predictive model.

Solution

After conducting exploratory data analysis, our team of experts utilized a range of machine learning techniques, including Logistic Regression, Random Forest, Naive Bayes, and Bagging, to develop a classification model that could accurately predict a patient's eligibility for a medical program based on doctor notations.

We also optimized the pipeline and cleaned the code to ensure efficient and accurate predictions. To further enhance the system's accuracy, we integrated Yolov5, Pose-Net, Torch, Tensorflow, and Tf-Lite (for transfer model to Nvidia Jetson) to improve the prediction capabilities.

Result

Upon completion of the project the client

- got the access to an advanced accounting system and internet shop engine
- benefited from streamlined financial processes, improved data analysis, and enhanced retail operations
- the integration of AI and ML technologies provided valuable insights, optimized decision-making, and boosted overall efficiency.

Technologies

Python, Numpy, Pandas, Yolov5, Pose-Net, Torch, Tensorflow, Tf-Lite (for transfer model to Nvidia Jetson), Sklearn, Nltk.



Muteki Group



AI solution in Screening Mammography Breast Cancer Detection

#Healthcare

#ML/AI

Client

International organization in Medical domain

Problem

According to the World Health Organization, breast cancer is the most common cancer worldwide, with 2.3 million new diagnoses and 685,000 deaths in 2020 alone. However, breast cancer mortality in high-income countries has decreased by 40% since the 1980s due to regular mammography screening. Early detection and treatment are crucial in reducing cancer fatalities, and machine learning skills can help streamline the process of evaluating screening mammograms used by radiologists. For Machine learning the task was challenging from the start due to the low number of positive class samples.

Solution

Despite the encountered difficulties we were able to get reasonably good results after implementing a good training pipeline that included positive class balance, scaling, model selection, and post-processing.

The final solution was based on the voting strategy, and then the average score based on votes. The four steps of the solution were straightforward, including processing the DICOM files into PNG, inferring the three posterior models from TTA, averaging the ensemble probabilities or voting, and thresholding.

Result

We've successfully implemented a training pipeline, with

- 85% accuracy
- processing the DICOM files into PNG
- inferring the three posterior models from TTA
- averaging the ensemble probabilities or voting, and thresholding

Technologies

Python, PostgreSQL, PyTorch, Joblib, Discomsdl, AWS.



Muteki Group



DX using Computer Vision and NLP technologies to recognize various types of documents and extract necessary information

#Logistics

#ML/AI

Client

A company involved in warehousing and inventory management.

Problem

The client faced the challenge of using multiple document types for various business scenarios, which led to the need to digitize all paper documents and organize them based on client details.

Solution

The client collaborated with Muteki Group to develop an AI solution using Computer Vision and NLP technologies to recognize various types of documents and extract necessary information by fields. The solution aimed to convert paper documents into digital format and sort them according to client specifications. It had the ability to identify different document types and extract relevant information from specific fields, which led to a significant improvement in the accuracy and efficiency of the extraction process.

Result

Impact

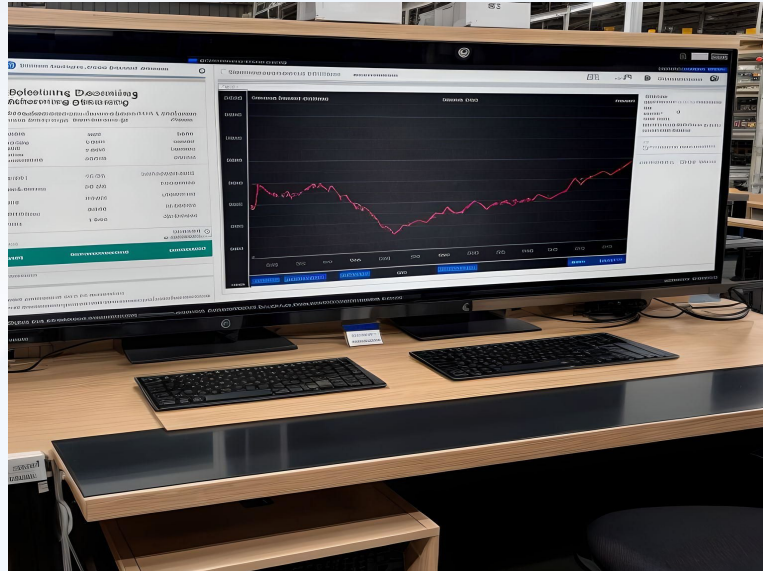
- project was completed successfully within the designated timeline
- achieving an accuracy rate of 87% in the text extraction process
- the client was fully satisfied with the outcomes

Technologies

AI: Python, PyTorch, TensorFlow, OpenCV, NumPy, pandas

Front End: axios, core-js, vue.js, vue-pdf, vue-router, babel-eslint, eslint

Back End: MySQL, flask, img2pdf, dicttoxml, pdf2image



AI-powered demand forecasting system for the client's manufacturing and distribution operations

#Logistics

#ML/AI

Client

A manufacturing company that operates a network of local warehouses and retailers.



Problem

Inaccurate forecasting of customer demand posed challenges for the client, resulting in suboptimal inventory management, higher operational costs, and customer dissatisfaction arising from frequent stockouts.

Solution

Our team proposed the implementation of an AI-powered demand forecasting system. This system leveraged real-time data analysis and advanced machine learning algorithms to generate accurate demand forecasts. By considering various factors such as historical sales data, market trends, promotional activities, and external factors, the system provided timely and precise predictions.

Result

Upon completion of the project, the client got

- optimized inventory management
- reduced operational costs associated with overstocking or stockouts
- improved manpower planning
- increased customer satisfaction level due to a reduced likelihood of encountering product unavailability

Technologies

Python, Machine learning frameworks (TensorFlow, PyTorch), AWS, data visualization tools.



Muteki Group



AI optimization of warehouse and inventory management processes

#Logistics

#ML/AI

Client

A company involved in warehousing and inventory management.



Problem

The client encountered challenges in attaining customer satisfaction, controlling operational expenses, preventing stockouts, and optimizing procurement processes. These obstacles impeded their capacity to promptly deliver superior products and efficiently meet customer demands.

Solution

Muteki Group developed an AI-powered system for inventory and warehouse management. The solution involved utilizing AI algorithms to detect defective products and packaging, implementing predictive inventory alerts for automated replenishment and supply network adjustments, analyzing historical data to forecast demand, and automating procurement through vendor matching and anomaly detection.

Result

Upon completion of the project, the client got

- reduced customer complaints and returns due to improved quality control
- enhanced operational efficiency
- cost savings from optimized inventory levels
- minimized stockouts, and streamlined procurement processes.

Technologies

HTML, CSS, JavaScript, React, Python, Django, AI, ML, MySQL, AWS.



Muteki Group



AI powered cross-platform accounting system and internet shop engine

#Retail

#ML/AI

Client

Mid-size company operating in the financial and retail sectors.



Problem

The client was facing challenges in managing their financial processes, analyzing large volumes of data, and integrating with hardware devices for retail operations. The existing systems lacked automation capabilities and struggled to provide accurate and timely insights for decision-making.

Solution

The solution was to develop a cross-platform accounting system and internet shop engine that integrated AI and ML technologies. This addressed the client's challenges by automating tasks, providing advanced data analysis capabilities, and enabling seamless integration with various hardware devices. The system offered an intuitive interface, supported document import/export, and facilitated efficient financial management.

Result

Upon completion of the project, the client got

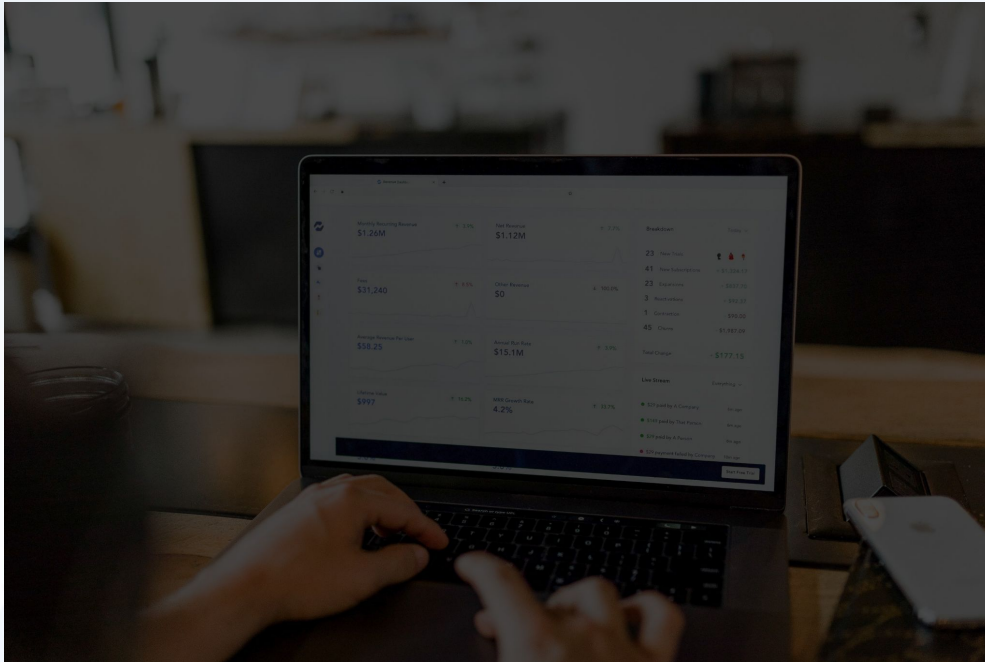
- advanced accounting system and internet shop engine
- benefited from streamlined financial processes
- improved data analysis and enhanced retail operations
- integration of AI and ML technologies provided valuable insights
- optimized decision-making and boosted overall efficiency

Technologies

C++, STL, QT, SQL, PL/SQL, Shell, Package building, OpenOffice/LibreOffice API, MS Office API, Artificial Intelligence, and Machine Learning



Muteki Group



AI based VR solution that aimed to improve internal processes and increase sales

#Retail

#ML/AI

Client

A leading global retailer/manufacturer in the industry.

Problem

The client encountered difficulties in making well-informed decisions concerning store design, product placement, and shopper activation. Conventional approaches lacked the essential visual and interactive features required for effective decision-making in a highly competitive retail landscape.

Solution

Muteki Group developed a virtual reality software solution that addressed the client's challenges. By leveraging virtual reality technology, the software provided a realistic and immersive environment for the client to visualize and optimize their merchandising strategies. It enabled the client to collaborate with stakeholders, explore different store layouts, test product placements, and evaluate shopper behavior, all within a virtual space. This solution empowered the client to make data-driven decisions and enhance their competitive edge.

Result

Upon completion of the project the client got

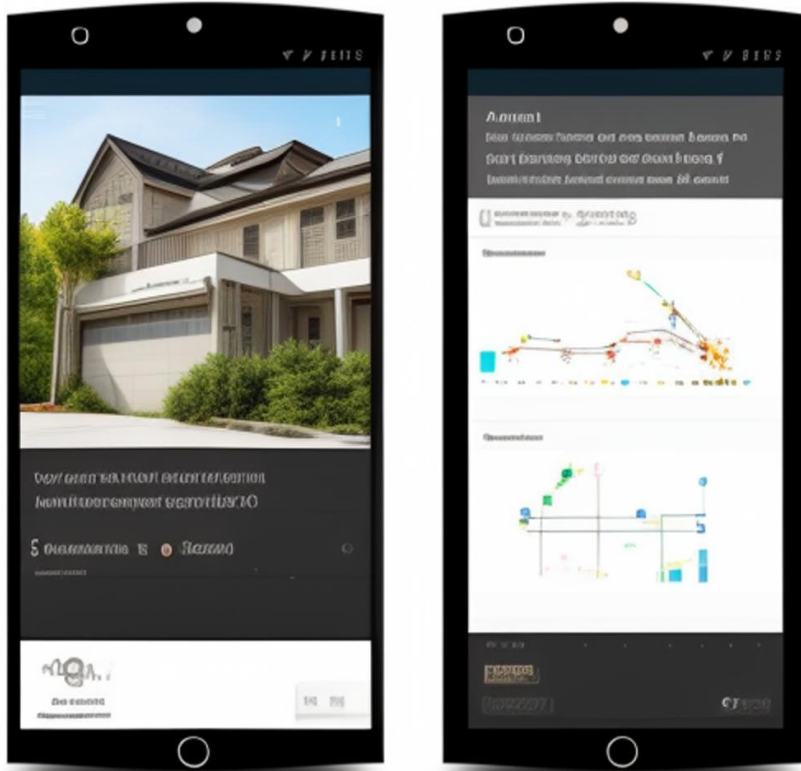
- a better understanding of customer behavior
- optimized store layouts for increased sales
- enhanced product visibility and placement
- improved overall customer engagement
- more efficient decision-making process and enabled to win at the point of purchase.

Technologies

JavaScript, TypeScript, React, HTML,CSS, AWS, PostgreSQL, Python, Django, REST API, Docker, Git, AI, VR



Muteki Group



Cutting-edge Proptech Mobile Application for Dubai Real Estate Market.

#PropTech

#ML/AI

Client

A prominent real estate agency in Dubai, specializing in offering innovative property solutions to both buyers and sellers. With an established reputation in the Dubai real estate market, the client aimed to revolutionize property transactions through technology.



Problem

The Dubai real estate market lacked a comprehensive digital platform for property transactions and services, leading to inefficiencies and fragmentation in the industry.

Solution

Muteki Group developed a state-of-the-art mobile application that brought together property listings, virtual property tours, AI-driven recommendations, and transactional capabilities. This solution streamlined the property search and transaction process, enhancing user convenience.

Result

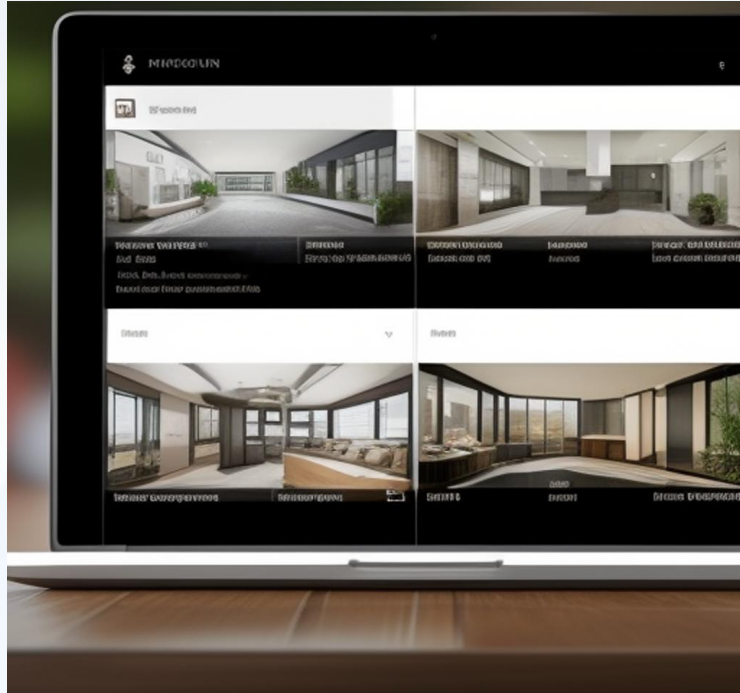
The proptech mobile app successfully addressed the market gap, offering users a user-friendly and efficient platform for property-related activities. Users experienced quicker property searches, engaging virtual tours, and personalized property suggestions, leading to increased user engagement and satisfaction.

Technologies

Swift (iOS), Kotlin (Android), ARKit (iOS), and ARCore (Android) for AR/VR, TensorFlow and Python for AI/ML, Google Maps API for geolocation, Node.js and Express.js for the backend, MongoDB for the database, JWT and SSL/TLS for security, Stripe for payment gateways, AWS for cloud services, Adobe XD and CSS for design, Git/GitHub for version control and collaboration.



Muteki Group



AI-Driven Real Estate Enhancement Project.

#AI/ML

#PropTech

Client

A leading real estate agency renowned for its expertise in property transactions and services. With a substantial presence in the real estate market, the client aimed to leverage advanced technology and artificial intelligence to elevate their offerings and enhance user experiences.



Problem

The existing real estate application faced several challenges that hindered its effectiveness. These challenges encompassed suboptimal performance, inadequate user experience, and the necessity to remain competitive in a rapidly evolving real estate landscape. The absence of advanced AI-driven features further limited the application's capabilities and hindered its potential to offer cutting-edge services.

Solution

The project introduced a comprehensive solution to address the identified problems. It entailed a multifaceted approach that included:

- Microservices Development:** The application's architecture was revamped by implementing microservices, enhancing scalability, flexibility, and maintainability.
- Performance Enhancement:** The team worked on improving the application's performance, achieving remarkable gains of up to 50% in certain services, ensuring smoother user interactions.
- AI-Driven Predictive Analytics:** A novel machine learning model was developed from scratch, leveraging PySpark and AWS SageMaker. This model could predict house sales, enabling users to make informed decisions based on data-driven insights.
- Modernization of Technologies:** The project encompassed migrating from traditional technologies like Spring 4 to more advanced versions like Spring 5 and transitioning from JDBC to Spring Data JPA. Additionally, the application shifted from SQL databases to Elasticsearch, enhancing search capabilities.

Result

The project's results were transformative and impactful:

- The application's performance was substantially enhanced, offering users quicker responses and improved navigation, contributing to higher engagement rates.
- The introduction of AI-powered predictive analytics provided users with valuable insights, aiding in making informed decisions when buying or selling properties.
- The modernization of technologies and migration to Elasticsearch led to a more efficient search experience, enabling users to find properties more effectively.

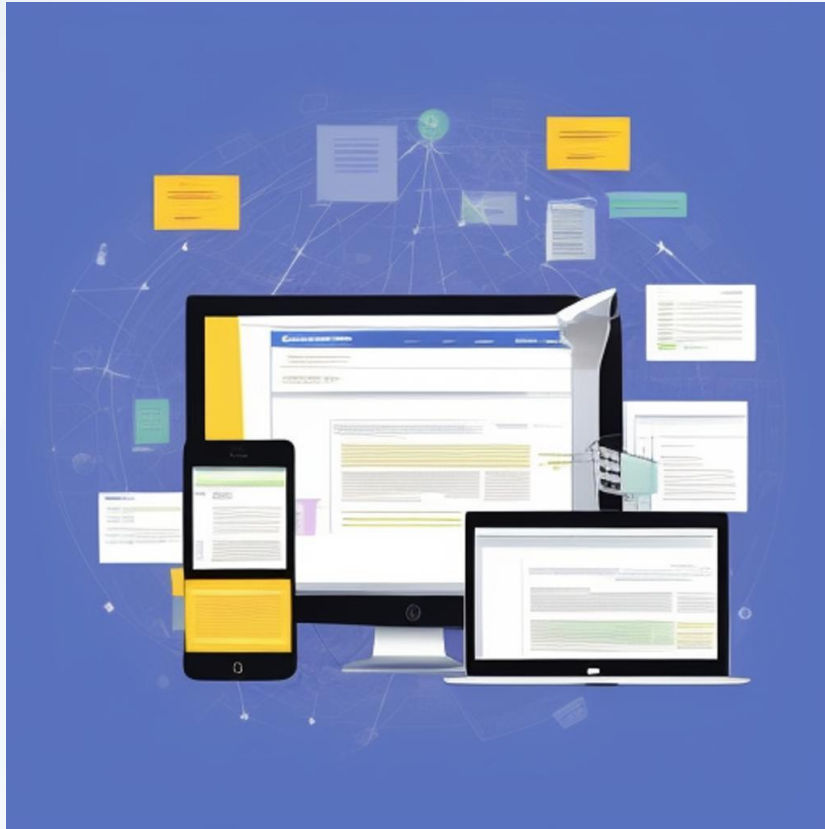
Collectively, these enhancements culminated in an improved overall user experience, a competitive edge for the client, and a well-optimized real estate application capable of meeting modern market demands.

Technologies

Java 8, Python, JavaScript ES5-ES6, Spring 4-5, Spring Boot 2, MySQL, Elasticsearch, Hibernate, PySpark, AWS SageMaker, AWS, Tomcat, Apache HTTP, JQuery, HtmlUnit, Selenium, Maven, Jenkins.



Muteki Group



Web-Based Document Management System for Real Estate Transactions.

#PropTech

#web

Client

A prominent legal firm based in New York, USA, specializing in real estate law and transactions.



Problem

The existing document management processes within the real estate transactions of Law Firm were burdened by manual procedures, leading to inefficiencies, errors, and a lack of centralized oversight. The absence of a streamlined system hindered effective collaboration and posed challenges in maintaining accuracy and transparency.

Solution

The project's solution aimed to revolutionize these challenges with a two-fold approach. Firstly, a user-focused Web application was developed, empowering clients to seamlessly upload, categorize, and manage transaction-related documents. Secondly, an administrative Admin panel was created to offer oversight, allowing administrators to supervise documents, manage ongoing deals, and assign user permissions.

Result

The project's results were transformative and impactful:

Efficient Document Handling: The manual burden of managing documents was lifted as clients gained access to a user-friendly platform, promoting easy and organized document uploads and categorization.

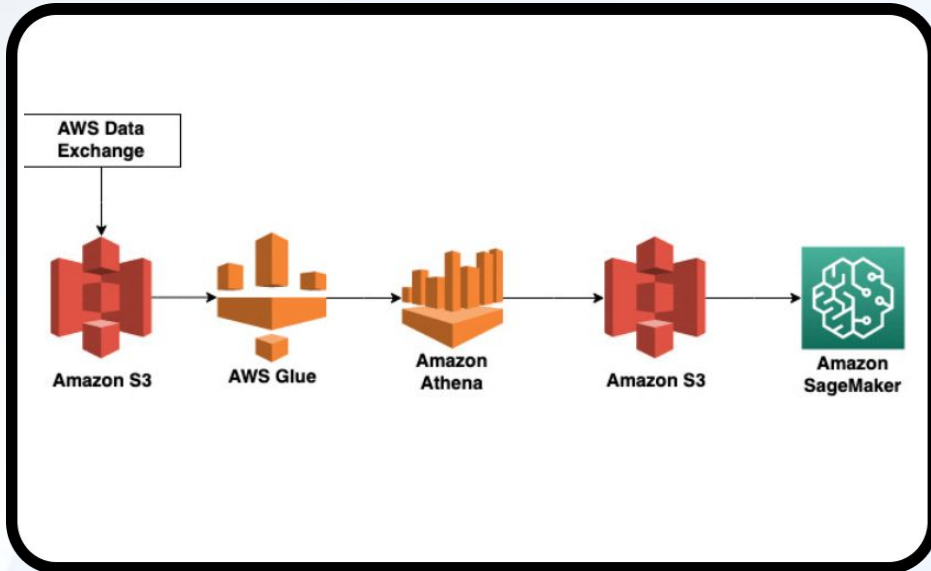
Enhanced Administrative Oversight: The Admin panel granted administrators comprehensive control over document flow, active deals, and user access, ensuring transparency and efficient management.

Reduced Errors: By digitizing document handling, the project led to a significant reduction in errors that often accompany manual processes.

Transparency and Collaboration: The platforms introduced transparency in transactions, encouraging collaboration and effective communication between clients and administrators.

Technologies

HTML, CSS, JavaScript ES5-ES6, JQuery, react.js, PHP, Laravel, MySQL.



Enhanced Machine Learning Solution for Lead Prediction and Classification

#ML

#prediction

Client

An American marketing company that assist financial service companies including insurance and automotive with direct marketing and advertising initiatives.

Problem

The company has built ML models that can predict which leads will likely reply to an offer or make a deal. These models do not reach the target level of accuracy, therefore the company needed help to improve the ML solution (or re-implement from scratch).

Solution

In this project our team developed, tested and compared multiple possible ML models and determined the best outcome for customer classification.

We successfully deployed the models to Amazon SageMaker, integrated them with the current solution, and implemented a periodic retraining process.

In our solution, we used Big Data and AWS Stack.

Result

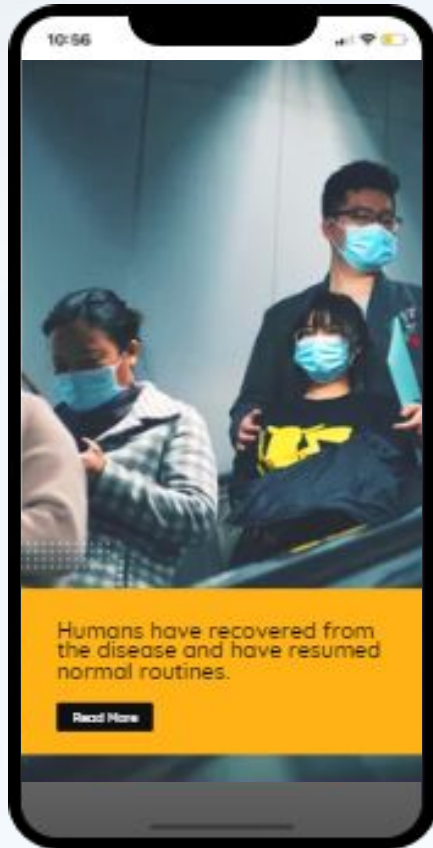
With Muteki Group's end-to-end solution, the client received a convenient platform with improved processes, including building workflow processes, building pipelines for training, then building pipelines for operating models.

Technologies

AWS Glue, Athena, AWS SageMaker, AWS SDK for Python (Boto3), S3.



Muteki Group



AI-Powered Medical News App for Personalized Content, Communities, and Event Organization

#AI

#healthcare

Client

A Canadian production company in medical domain. Located in Toronto.



Problem

The main requirements were to develop an innovative app, that can help doctors receive targeted newsletters, build communities and organize events.

Solution

Muteki Group has developed an AI-powered mobile application. The medical news app analyzes unique personal preferences and takes the user's profile. The applied artificial intelligence technologies help doctors get the news with a high level of personalization.

Application:

- Analyzes all collected data;
- Gives targeted news;
- Invites doctors to join special communities in accordance with their specialization and common interests.

Result

The client has got an application with a user-friendly interface, targeted newsletters, and all personal events that are managed in a fast and efficient way. Due to the solution, doctors can also share their data with friends and followers in the community.

Technologies

AI, iOS, Android



Muteki Group



Multinational Electronic Manufacturing Data Optimization

#AI

#Manufacturing

Client

Global Electronic Manufacturing Network (Locations in Indonesia, Mexico, USA)



Problem

The client, a global electronic manufacturing network with facilities in Indonesia, Mexico, and the USA, faced challenges in efficiently managing and analyzing data generated across their multinational factories. They needed a solution to process, store, and analyze the data to improve production efficiency and decision-making.

Solution

The project aimed to create a comprehensive cloud-based data processing and analysis solution. We leveraged a variety of technologies, including Amazon Web Services (AWS), to handle data ingestion, storage, real-time processing, and predictive analytics.

Data Ingestion: IoT devices and sensors from factories worldwide sent data to the cloud via AWS Kinesis streams, ensuring real-time data flow.

Data Storage: Data was efficiently stored in Parquet format on Amazon S3 for scalability and cost-effectiveness.

Data Processing: AWS Glue and EMR clusters were used to transform and prepare data for advanced analytics.

Machine Learning: Amazon SageMaker facilitated the development and deployment of machine learning models for predictive analysis.

Data Labeling: Amazon SageMaker Data Labeling aided in training machine learning models with labeled data.

Data Querying: Amazon Athena allowed for ad-hoc querying of data for quick insights.

Image Recognition: AWS Rekognition was employed for image analysis.

Automation: AWS Lambda functions automated various processes, reducing manual intervention.

Result

The implementation of this comprehensive solution significantly improved the client's ability to monitor and manage production processes in real-time. The analytics and predictive capabilities enabled trend identification and process optimization, leading to increased production efficiency and better decision-making. The multinational factories benefited from reduced downtime and improved overall product quality.

Technologies

Programming Languages: Python, C#, .NET Core, ASP.NET

Data Science and Analysis: Pandas, NumPy, Matplotlib, Scikit-Learn, SciPy, PyTorch, Dask, Numba

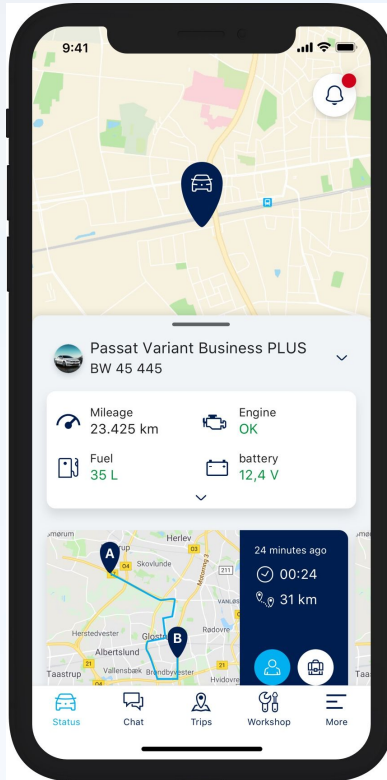
Database Systems: Microsoft SQL Server (MsSql), PostgreSQL

Cloud Services: Amazon Web Services (AWS)



Muteki Group

Innovative Mobility Solutions Development



#AI

#mobile

Client

An Auto-Tech Company from Denmark



Problem

The automotive and mobility industries face several challenges, including:

Inefficient Customer Interaction: Many auto service providers and fleet management companies struggle with effective communication with their clients. This can lead to customer dissatisfaction and business loss.

Suboptimal Fleet Management: Fleet managers often lack tools for efficient monitoring and management of their vehicle fleets, impacting safety and productivity.

Lack of Convenient Services for Car Owners: Vehicle owners frequently encounter difficulties in tracking their vehicle's status and interacting with auto service providers, affecting their overall experience.

Solution

The project involves the development of innovative solutions aimed at addressing these challenges. We provide tools to streamline interactions between auto service providers and customers, optimize fleet management, and enhance the driver experience. Our solutions offer effective vehicle monitoring for workshops and fleet managers, as well as a better driving and service experience for car owners.

Result

Implementation of our solutions helps automotive companies in Denmark and worldwide improve customer relations, increase operational efficiency, and enhance customer satisfaction. They also deliver intelligent and effective vehicle monitoring for workshops and fleet managers while providing a superior driving and service experience for car owners. Ultimately, these innovations enable safer, more sustainable, and more convenient mobility worldwide through responsible and transparent data collection and sharing.

Technologies

Amazon S3, Amazon SageMaker, Amazon Kinesis Firehose, Amazon Kinesis Streams, Amazon Kinesis Analytics, Amazon DynamoDB, Amazon Cognito, Amazon Lambda, Amazon EC2, Amazon IoT Core, Amazon IoT Greengrass, Amazon SNS, Python, NumPy.



Muteki Group



Anomaly Detection for Data Security

#AI

#detection

Client

Anomaly Detection Solutions Provider (USA)



Problem

In today's data-driven world, ensuring data security is paramount. The increasing volume of data makes it challenging to identify unusual patterns or anomalies that may indicate security breaches or system malfunctions. Traditional methods are often insufficient for timely detection.

Solution

Project focuses on developing a robust anomaly detection system using advanced machine learning techniques. We leverage TensorFlow and the Keras library for model development and h5py for model serialization. This system is designed to monitor various data sources in real-time, including IoT devices, using AWS services such as SageMaker, S3, EC2, Kinesis, Lambda, and more. It analyzes incoming data streams, identifies anomalies, and triggers alerts when necessary.

Result

The implementation of our anomaly detection solution enhances data security significantly. It enables early detection of irregular patterns or potential threats, allowing for timely response and mitigation. This leads to improved data protection, reduced risks, and enhanced system reliability, ultimately ensuring a safer and more secure environment for our clients.

Technologies

TensorFlow, Keras library, h5py, Python, AWS (SageMaker, S3, EC2, ECS, ECR, Kinesis, IoT, Lambda, Amazon Aurora, Amazon RDS, ElastiCache, DynamoDB, CloudFormation, SNS, SQS).



Muteki Group



Enhanced Computer Vision Algorithms for Automated Game Highlights

#AI

#Game

Client

Game Solutions Provider (USA)



Problem

In the realm of sports broadcasting and entertainment, creating engaging game highlights is a complex and time-consuming task. Existing computer vision algorithms for tasks like ball tracking, player tracking, player identification, and game score determination are already in production but require improvement. Additionally, there is a need to combine these capabilities into a single product that can automatically identify and extract the most captivating moments from a sports game. Furthermore, as new sports emerge, these algorithms must be developed from scratch to cater to their unique characteristics.

Solution

The project is dedicated to enhancing and fine-tuning existing computer vision algorithms for various sports-related tasks. These tasks include ball tracking, player tracking, player identification, game score determination, and more. We are also working on the integration of these capabilities into a unified product that can automatically identify and extract the most exciting and critical moments from sports games. Additionally, when venturing into new sports or uncharted territories, we develop these computer vision approaches from the ground up to adapt to the specific demands and dynamics of the sport.

Result

The implementation of these enhanced computer vision algorithms and the creation of a unified product for automated game highlights have the potential to revolutionize sports broadcasting and viewer engagement. This project aims to significantly reduce the manual effort required to curate game highlights, making them more accessible and exciting for fans. By developing these algorithms from scratch for new sports, we expand the scope of automated game highlight generation, offering a versatile solution for a wide range of sports and events.

Technologies

OpenCV, TensorFlow, Keras, Amazon Web Services (AWS) (SageMaker, S3, EC2, Lambda), Cloud Computing



Muteki Group



Subtitle Removal and Translation for Song Videos

#AI

#video

Client

Video Content Provider (EU)



Problem

In the context of video content provision, there is a need to remove original subtitles from songs in movies and replace them with translated lyrics in different languages. Movie suppliers often provide films with pre-inserted subtitles for songs, which can lead to confusion when translating the movie into other languages. The objective was to develop a solution to remove these original subtitles effectively.

Solution

Our AI team was tasked with developing an advanced solution to tackle this challenge. State-of-the-art approaches in natural language processing and computer vision were employed to remove the original song subtitles seamlessly. Additionally, the solution included the translation of song lyrics into different languages. An MVP (Minimum Viable Product) version of the product was meticulously crafted to ensure effectiveness.

Result

The MVP version of the product was delivered to the end customer for testing and evaluation. Upon successful implementation, this solution has the potential to streamline the process of translating and localizing movies with songs, ensuring that subtitles do not interfere with the viewer's experience. This can significantly enhance multilingual accessibility and viewer satisfaction for song sequences in movies.

Technologies

Transformers, OpenCV, Neural Machine Translation (NMT), Python



Muteki Group



Quality Control for Printed Labels Defects Detection

#AI

#printing

Client

Manufacturing Company (Poland)



Problem

In manufacturing, ensuring the quality of printed labels is crucial to meet product standards and reduce manufacturing costs. Manual inspection is often time-consuming and prone to errors. The goal was to develop an automated system to classify and detect defects in printed labels using a combination of machine learning algorithms and classical computer vision techniques.

Solution

The project focused on creating an advanced quality control system. It utilized machine learning algorithms for image classification and classical computer vision techniques for defect detection. The system was trained on a dataset of labeled images to recognize and classify common defects like misprints, smudges, or missing labels. Real-time image processing allowed for quick and accurate defect identification.

Result

The implementation of this automated quality control system led to significant improvements in product manufacturing. By reducing the need for manual inspection, it lowered labor costs and increased production efficiency. Moreover, it ensured a higher standard of label quality, minimizing waste and rework. The result was a cost-effective solution that enhanced the manufacturing process.

Technologies

TensorFlow, PyTorch, OpenCV), Image Processing Tools, Dataset Preparation Tools, Python, Hardware Components.



Firmware Development for Fiber Communication Unit

#IoT

#communication

Client

Global communication service provider



Problem

The project aimed to develop firmware for a Fiber Communication Unit to manage internal processes. It also required creating drivers for internal wired interfaces, establishing logging subsystems, and defining protocols for external communications. Additionally, a set of tests needed to be developed to validate the device's correct behavior.

Solution

The project involved the development of firmware, including code, drivers, and testing procedures. Technologies like C/C++, MPLAB X, CMake, and others were used to create a robust firmware solution.

Result

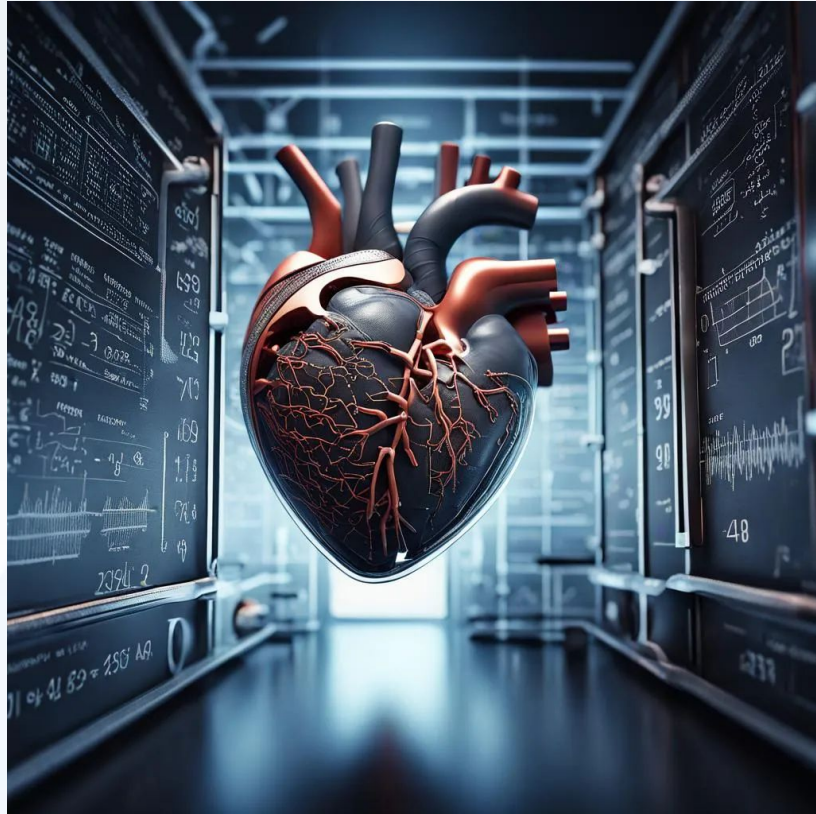
The project resulted in the successful development of firmware for the Fiber Communication Unit. This firmware enabled efficient internal process management and reliable external communication. The set of validation tests ensured the device's proper functioning, contributing to reduced manufacturing costs.

Technologies

C/C++, MPLAB X, CMake, GCC, Ninja, GIT, UART, I2C, SPI



Muteki Group



Math Model and C-Code Library for Breath and Heart Monitoring

#IoT

#healthcare

Client

Medical technology company specializing in infant healthcare devices



Problem

The project involved designing a mathematical model for a single-sensor system to monitor a baby's breath and heartbeat. This model was converted into a C-code library and complemented with a series of tests.

Solution

The team created a mathematical model, translated it into C code, and developed a comprehensive set of tests for validation. Technologies like C/C++, CMake, GCC, Python, and Matlab were used for development.

Result

The project yielded a reliable math model and C-code library for monitoring a baby's breath and heartbeat. This system could be crucial for ensuring the well-being of infants.

Technologies

C/C++, CMake, GCC, Python, Matlab, Ninja, Jira, GIT



Muteki Group



Development of a Growing System

#IoT

#agriculture

Client

Agrotechnology company focused on innovative solutions for agriculture



Problem

The project involved creating a sample greenhouse device with a common interface for connecting various sensors. This device included a subsystem for controlling external equipment, and it allowed customers to monitor microclimate conditions through different interfaces.

Solution

The team developed code, calibration methods, and mathematical models for the growing system. They also reviewed schematics and addressed any bugs in the system.

Result

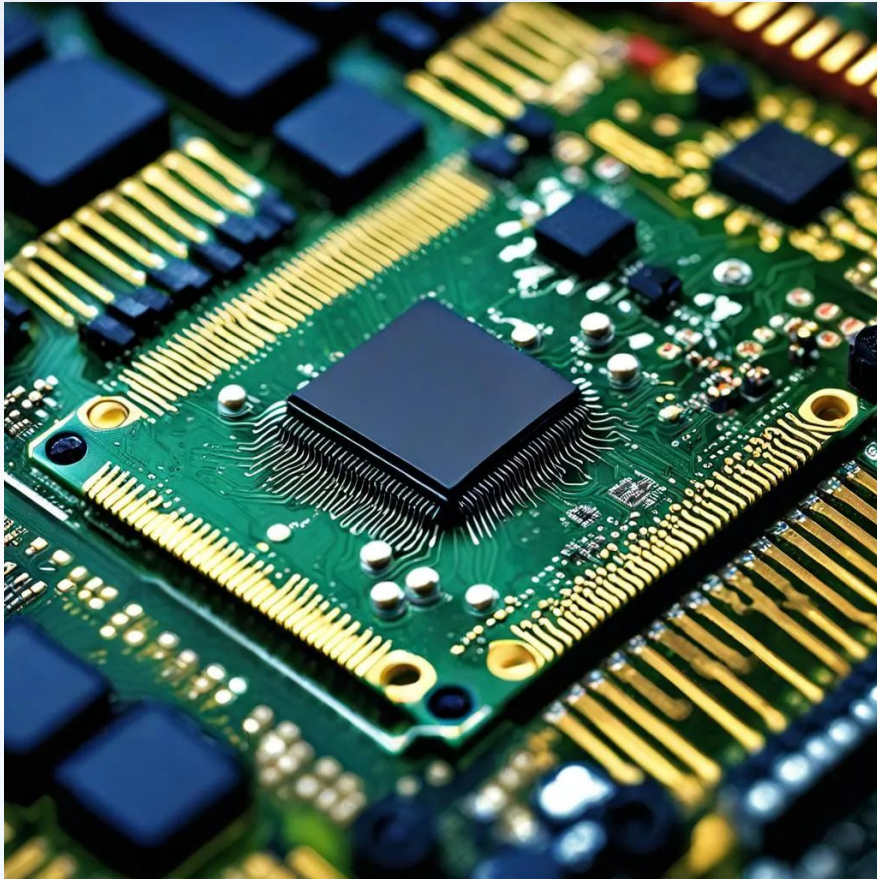
The project delivered a functional greenhouse device with monitoring capabilities, offering users the ability to track microclimate conditions through a device screen, mobile app, or web interface.

Technologies

C/C++, CMake, GCC, Python, Matlab, Ninja, Jira, GIT, DRCC16, UART, RS232, RS485



Muteki Group



Development of a System for Automation and Data Processing

#IoT

#dataprocessing

Client

Manufacturer of automated control and monitoring systems for industrial enterprises



Problem

The project focused on developing a system based on System-on-Chip (SOC), System-on-Module (SOM), and other PC boards with ARM processors for automating the management of various measuring and registration systems using wired interfaces. The system also involved custom electronic component design and manual or remote control subsystems.

Solution

The team was responsible for code development, math modeling, code reviewing, schematics review, bug fixing, and porting software from Linux to Windows. The project aimed to create an efficient and versatile data processing system.

Result

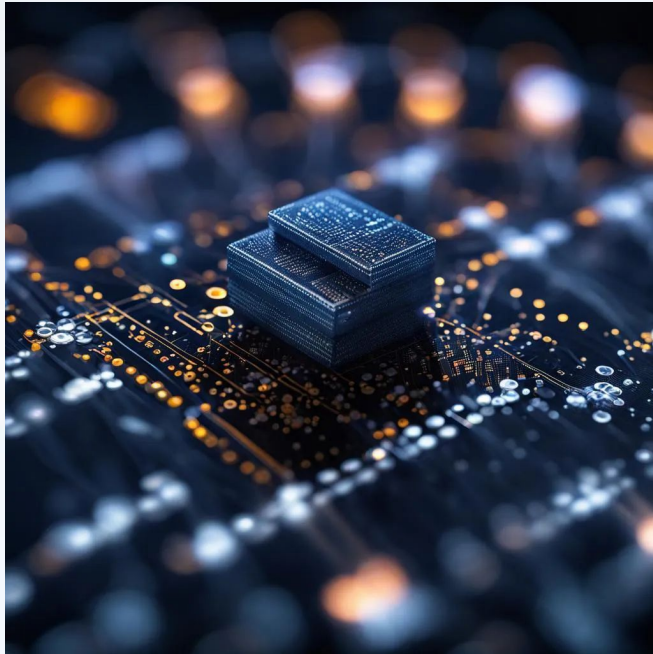
The project resulted in the development of a powerful data processing system capable of automating various measurement and registration tasks. The system could be controlled remotely via SSH and RDP and was customized for specific customer needs.

Technologies

C++, CMake, GCC, GIT, Ninja, Raspberry Pi, Orange Pi, IMX6, ESP32, I2C, SPI, CAN, USB, UART, RS232, RS485



Muteki Group



Application System for Data Analysis and Visualization

#IoT

#dataprocessing

Client

Research institute specializing in data analysis and processing



Problem

The project involved developing an application system for analyzing, calculating, and visualizing data obtained from measuring modules. The data underwent various processing, including neural networks and machine learning, to provide users with comprehensive information about measurements.

Solution

The team was responsible for code development, math development, code reviewing, estimation, business analysis, and bug fixing. The project aimed to create an efficient application system for data analysis.

Result

The project resulted in the development of an application system capable of processing and visualizing data from measuring modules. It utilized advanced algorithms and machine learning techniques to provide users with valuable insights.

Technologies

Matlab, C++, Python, MSVS, Jira, TFS



Muteki Group



SCADA System for Technological Equipment and POS-Terminals

#IoT

#SCADA

Client

Global manufacturer of industrial equipment and point-of-sale terminals



Problem

The project aimed to develop a client-server system for monitoring and managing various industrial equipment, trade cash register equipment, vending machines, and more. The system collected data from interfaces, performed data analysis, generated warnings for malfunctions, and ensured security through data encryption.

Solution

The team was responsible for architecture and design, code development, code reviewing, fixing bugs, product support, and documentation maintenance. The project involved the creation of a secure and reliable SCADA system.

Result

The project resulted in a robust client-server SCADA system capable of monitoring and managing a wide range of industrial equipment. Data was encrypted to protect against external interference, and the system was equipped with security features.

Technologies

C/C++, Keil, GCC/GDB, FreeRTOS, Altium, I2C, SPI, CAN, USB, UART, RS232, RS485, ModBus, MDB, TCP/IP, 2G/3G, Git, Jira, Confluence



Muteki Group



Development of a Mobile SCADA Laboratory

#IoT

#SCADA

Client

Road management and infrastructure agency



Problem

The project involved the development of a mobile laboratory in the form of a SCADA system for road expertise. This laboratory included IP-video cameras, a GPS navigator, and various measuring sensors to assess road conditions.

Solution

The team was responsible for architecture and design, code development, fixing bugs, product support, and documentation maintenance. The project aimed to create a mobile SCADA system for road expertise.

Result

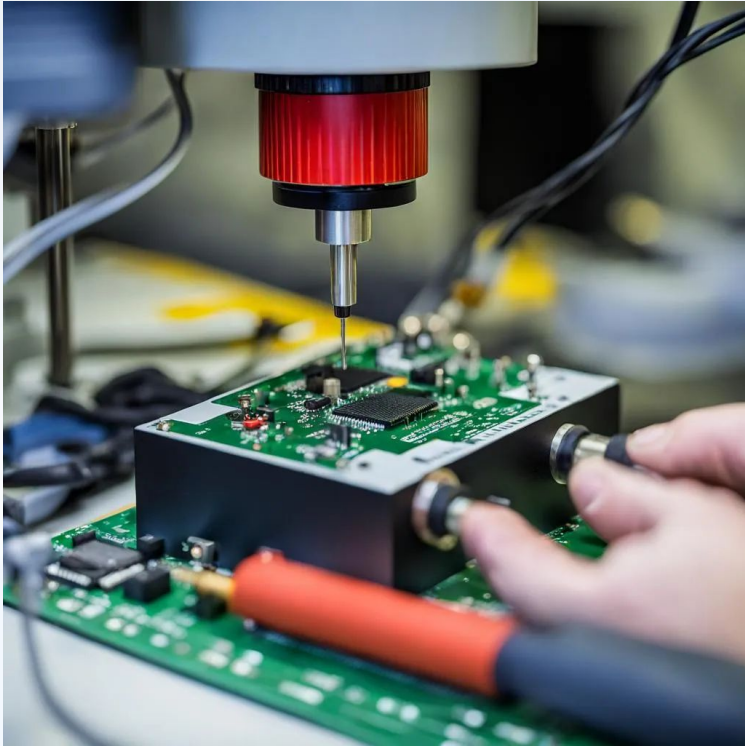
The project resulted in a mobile SCADA laboratory equipped with video cameras, sensors, and a GPS navigator. It enabled the collection of valuable data on road conditions and allowed users to insert control points during data collection.

Technologies

C/C++, GCC/GDB, Ubuntu, TCP/IP, Git



Muteki Group



Measurement While Drilling (MWD) system

#IoT

#drilling

Client

Oil and gas company involved in drilling and extraction



Problem

The project involved electronic and firmware development for various measuring modules used in a Measurement While Drilling (MWD) system. This included inclinometers, gamma detectors, neutronic detectors, temperature sensors, pressure sensors, and more.

Solution

The team was responsible for electronic design, PCB design, math modeling, code development, fixing bugs, product support, and documentation maintenance. The project aimed to create reliable and accurate measuring modules.

Result

The project resulted in the development of high-quality measuring modules and diagnostic tools. The modules were crucial for obtaining operational information about well conditions.

Technologies

C/C++, ASM, VHDL, MatLab, Visual Studio, Keil, ISE, PCad, Altium, I2C, SPI, CAN, USB, Manchester2, LVDS, UART, RS232, RS485, ModBus



Muteki Group



Logging System for Research of Oil and Gas Wells

#IoT

#oilandgas

Client

Research institute specializing in gathering operational data on oil and gas wells



Problem

The project involved the development of electronic components and firmware for a cable-logging system used to assess the state of oil and gas wells. It included various measuring modules based on induction methods, acoustics, inclinometers, calipers, and more.

Solution

The team was responsible for electronic design, math modeling, code development, fixing bugs, product support, and documentation maintenance. The project aimed to create reliable measuring instruments.

Result

The project resulted in the development of measuring modules, data protocols, and diagnostic tools. These components were essential for obtaining accurate and detailed operational information about well conditions.

Technologies

C/C++, ASM, VHDL, MatLab, Microcap, Visual Studio, Keil, ISE, PCad, Altium, I2C, SPI, CAN, USB, Manchester2, LVDS, UART, RS232, RS485, ModBus



Muteki Group



Digital Twin for Eco-Friendly Home

#IoT

#smarthome

Client

A forward-thinking environmental technology company



Problem

This innovative project aimed to create a digital twin for eco-friendly homes, offering homeowners a tool to optimize their energy usage, reduce carbon footprints, and lower utility bills.

Solution

A network of IoT sensors was deployed throughout the eco-friendly home to collect data on energy consumption, water usage, indoor air quality, and solar panel efficiency. This real-time data was sent to the cloud, where it was processed and used to generate a detailed digital twin.

Result

The project's completion has provided homeowners with several benefits:

- Real-time monitoring and control of energy consumption.
- Automated adjustments to heating, cooling, and lighting for optimal efficiency.
- Insights and recommendations for further eco-friendly improvements.

Technologies

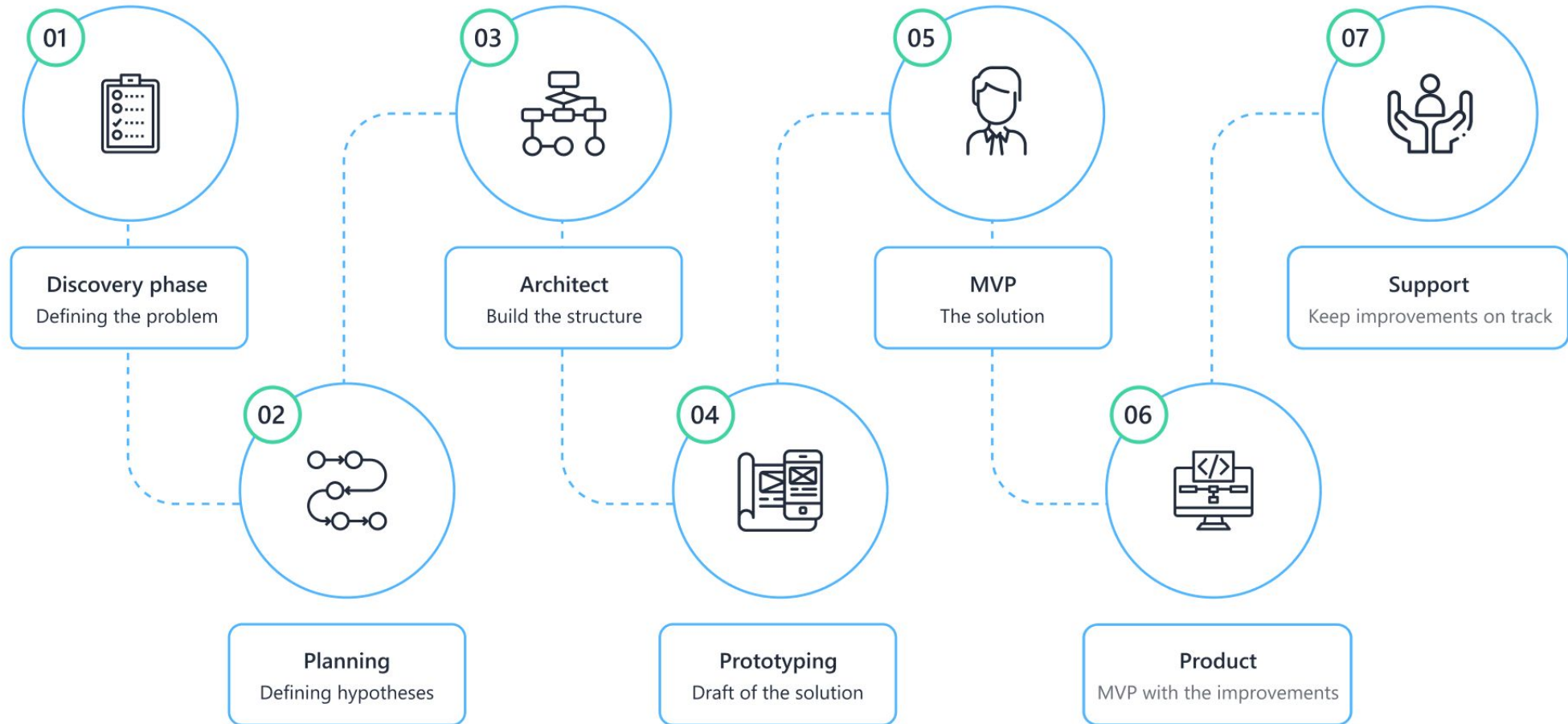
IoT sensors, cloud computing, data analytics, real-time monitoring.

Our Process

Depending on the client's needs and level of involvement in the project, we are eager to start on any stage:



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Let's discuss your product!

We are on social media:



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Muteki Group

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