EGERTON   **UNIVERSITY**

FIELD ATTACHMENT REPORT

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ORGANIZATION: UMMA INSURANCE BROKERS

ATTACHMENT PERIOD: 16 JUNE 2025 – 25 AUGUST 2025

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Introduction

This report presents a detailed account of my industrial attachment at Umma Insurance Brokers from 16th June 2025 to 25th August 2025. The attachment was undertaken as part of the requirements of the Bachelor of Science in Computer Science program at Egerton University.

The purpose of the industrial attachment was to provide practical exposure to real-world working environments, enabling me to apply theoretical knowledge gained in class to professional tasks. It also aimed to equip me with hands-on experience, enhance problem-solving skills, and improve my understanding of the role of Information Technology in the insurance industry.

This report documents the organization's profile, the activities I was engaged in, the skills I acquired, challenges faced, solutions implemented, observations made, and recommendations for both personal growth and organizational improvement. The report concludes with lessons learned and appendices that provide evidence of the work done during the attachment.

1 Organization Profile

1.1 Background and History

Umma Insurance Brokers, founded in 2019, is a regional insurance intermediary headquartered in Nairobi, Kenya, with expanding subsistence in Somalia. The firm specializes in risk transfer, managed insurance, and advisory services across multiple countries in East Africa. It aims to "innovate risk management and insurance intermediation across Africa through targeted product design, intelligent service, and convenient distribution channels"

1.2 Company Vision and Mission

The firm's vision is clear and ambitious:
"Manage risk and insurance in Africa through innovation."

Its mission further elaborates its purpose:
"To secure the future of our customers, employees, and partners by providing innovative risk management solutions."

1.3 Core Business Activities

Umma Insurance offers a wide array of insurance products and services, including but not limited to:

- Health, motor, home, family, travel, marine, industrial, aviation, accident, and index insurance.

- Risk advisory, managed services, and consultancy offerings tailored for diverse client needs.

- Instant, hassle-free quotes and streamlined insurance solutions through digital and human channels

1.4 Organizational Structure and Leadership

The company is structured across core departments, such as Customer Service, Claims Management, Underwriting, Finance, and IT. These teams collaborate to deliver seamless insurance services. The leadership team includes prominent figures like:

- **Chairman**: Hassan Bashir

- **Group CEO**: Ahmed Sheikh

- **Operations Manager**: Anthony Mbacio

- **Country Manager** : Abdiweli Bashir

1.5 Core Values and Operational Philosophy

Umma Insurance is grounded in values that drive its culture and client engagement:

- **Technology**: Leveraging innovation, predictive analytics, and tech-driven service for superior solutions.

- **Respect**: Upholding the dignity of clients, staff, and community.

- **Unity of Purpose**: Delivering "Service for Good" with collective commitment.

- **Superior Customer Service**: Focusing on empathy, clarity, and customer-centric experiences.

- **Transparency**: Simplifying insurance processes and always being candid in communication

1.6 Competitive Advantage and Reach

With a team of experienced professionals equipped with deep knowledge in risk management, regulatory compliance, and corporate governance, Umma Insurance has built trust across clients and partners. The company collaborates with insurer partners such as Jubilee Insurance, APA Insurance, CIC, Sanlam, and Prudential, to deliver robust coverage across East Africa

2 Activities

During my attachment period at Umma Insurance Brokers, I was actively involved in a wide range of technical and operational tasks. These activities exposed me to real-world IT environments, data analysis, software development, and insurance-related technology solutions. Below is a breakdown of my weekly activities and contributions:

2.1 Week 1: Orientation and Introduction to ICT Systems

The first week was mainly focused on understanding the organization, its staff, and operations. I was introduced to Umma Insurance's ICT infrastructure, including how the company's Wi-Fi network is structured and distributed across access points. I researched the company's core insurance services and explored the concept of cloud-based insurance. In addition, I studied the structure of the

company's website and experimented with free hosting platforms such as GitHub Pages and Render, gaining exposure to web hosting and deployment practices.

2.2 Week 2: Chatbot Development and Basic IT Support

This week centered on chatbot research and prototyping. I explored various chatbot frameworks, including Dialogflow, Rasa, and OpenAI-based solutions, before creating a simple chatbot prototype connected to a custom HTML interface. I also gained hands-on experience in designing intents and entities for FAQs. Beyond chatbot work, I performed IT support tasks, such as diagnosing and reinstalling an operating system on a slow laptop, which enhanced my troubleshooting skills.

2.3 Week 3: API Integration, Data Cleaning and IT Maintenance

I integrated a Dialogflow chatbot with Google Sheets using webhooks and APIs, allowing automated logging of conversations and also handled user query matching using webhook logic in JavaScript. I also linked the chatbot to a human support agent system through Tawk.to. In parallel, I engaged in hardware maintenance by cleaning printer cartridges. On the data side, I practiced data cleaning with Pandas and NumPy, performing grouping, sorting, and exporting operations.

2.4 Week 4: Data Analysis and Visualization

This week was heavily focused on data analytics. I analyzed datasets using Pandas and NumPy, exported results into Excel and CSV formats, and created visualizations such as heatmaps and line and bar graphs using Matplotlib and Seaborn. Additionally, I learned how to handle internal communication systems by troubleshooting unconnected telephone lines. Towards the end of the week, I began exploring machine learning basics, including how to select models for different prediction tasks.

2.5 Week 5: Advanced Chatbot Development and Networking

My focus shifted towards AI-powered customer support systems. I built an advanced chatbot using LangChain and Hugging Face for vectorization, experimenting with Groq and LLaMA models. I designed a user interface with HTML, CSS, and JavaScript, connecting it to the backend via APIs. I also troubleshooted slow Wi-Fi performance by testing network speed, packet loss, and

traceroutes. Finally, I connected the chatbot to Google Sheets for conversation logging and tested local hosting through ngrok.

2.6 Week 6: System Setup, Version Control and RAG Research

This week involved setting up new desktops, installing printer drivers, and configuring wireless connectivity. I learned Git and GitHub basics, including version control, repository management, and project collaboration. I also researched Retrieval-Augmented Generation (RAG) as a way to keep AI models updated with reliable, context-specific information. Additionally, I continued training and fine-tuning the company chatbot and studied data preprocessing techniques for AI model development.

2.7 Week 7: Predictive Modeling and Computer Vision

I began working on machine learning applications for insurance, creating a motor vehicle insurance premium prediction model using Random Forest Regression. I designed a simple user interface for the model and learned evaluation metrics such as accuracy, R^2 score, and Mean Absolute Error. I also explored computer vision techniques (e.g., thresholding, feature extraction, and edge detection). Towards the end of the week, I optimized the chatbot for production by adding security features such as prompt-injection prevention and error handling.

2.8 Week 8: Intermediate ML, Deep Learning and Finalization

On this week I focused on intermediate machine learning and deep learning concepts. I learned about encoding methods, cross-validation, gradient boosting, and preventing data leakage. I added a customer feedback feature to the chatbot and documented my project for deployment. Additionally, I was introduced to the foundations of deep learning, including neural networks, activation functions, forward/backward propagation, and gradient descent optimization.

2.9 Week 9 Onwards Activities

On the final weeks of my attachment I was tasked with developing a fully dynamic website equipped with an admin dashboard. The project emphasized modern web development practices and full-stack integration. The key components included:

- **Frontend Development**: Designing a responsive, user-friendly interface using HTML, CSS, and JavaScript to ensure seamless user interaction.

- **Backend Integration**: Implementing server-side logic using Node.js to handle requests, authentication, and content management.

- **Admin Dashboard**: Creating an intuitive dashboard that allows administrators to add, edit and delete content dynamically, such as news, updates or organizational information.

- **Database Connectivity**: Linking the admin dashboard and to MySQL database to enable real-time data storage, retrieval and updates. Also linking the frontend public web to fetch content and store user applications and messages.

- **Security Features**: Incorporating access control measures to ensure only authorized users could manage website content.

- **Testing and Debugging**: Carrying out iterative testing to resolve bugs, improve performance, and ensure the website met modern usability standards.

This project enhanced my skills in full-stack development, dynamic content management, and database-driven systems, which are crucial for real-world applications in the insurance and finance sector where secure and efficient online platforms are needed.

3 Observations and Findings

During my industrial attachment at Umma Insurance Brokers, I made several key observations about the workplace environment, the insurance industry, and the application of data-driven technologies in business operations. These observations and findings are categorized as follows:

3.1 Workplace Environment and Culture

- The organization demonstrated a highly professional work culture that emphasized teamwork, punctuality, and accountability.

- Knowledge-sharing was common, with senior staff offering guidance and mentorship to attachment students, which enhanced the learning experience.

- Remote and hybrid work practices were occasionally adopted, highlighting the company's embrace of flexibility and digital collaboration tools.

3.2 Technology Integration in Insurance

- Insurance as a field relies heavily on trust, documentation, and risk assessment. I observed that digitization is transforming these processes by making services more accessible and efficient.

- Data-driven tools are increasingly being used to analyze customer patterns, manage risks, and predict claims behavior.

- There is a growing shift from traditional manual processing toward automated systems, reducing errors and improving turnaround time.

3.3 Data Analysis and Insights

- I found that data cleaning and preparation are often the most time-consuming but also the most crucial steps in data analysis. Clean, structured data produces more accurate insights.

- Through my analysis work, I discovered patterns in customer behavior, such as seasonal demand for insurance products and the importance of demographics in product uptake.

- I observed how analytics could support decision-making, such as identifying profitable segments, detecting fraudulent claims or highlighting underperforming insurance products.

3.4 Predictive Modeling and Machine Learning

- Predictive models offer significant potential in anticipating customer churn, default risks and claims probability.

- Building ML models during my attachment gave me insight into how insurance companies can shift from reactive strategies to proactive ones, such as customizing policies or offering discounts to high-retention customers.

- I also noted the importance of continuous model monitoring and retraining, since insurance data is dynamic and constantly evolving.

3.5 Customer-Centric Digital Solutions

- The chatbot project revealed that conversational AI can greatly enhance customer support by providing instant responses and reducing dependence on call centers.

- A notable finding was that chatbots need to handle end-of-conversation detection and collect feedback to ensure continuous improvement.

- I realized that digital self-service tools can increase customer satisfaction and attract younger, tech-savvy clients.

3.6 Web Development and Automation

- Developing a dynamic website with an admin dashboard demonstrated the importance of having robust digital platforms where businesses can manage and update content in real-time.

- I observed that user-friendly admin dashboards reduce dependency on developers, allowing non-technical staff to update content efficiently.

- Security and user authentication stood out as critical elements, especially in industries like insurance where sensitive customer data is handled.

3.7 General Learnings

- The attachment period exposed me to **real-world challenges** such as debugging code, handling large datasets, managing project timelines and ensuring data security.

- I also found that communication skills are as important as technical skills, since explaining data insights or technical solutions to non-technical staff requires clarity and patience.

- A recurring observation was that innovation and adaptability are essential for any company seeking to stay competitive in the fast-changing insurance and financial services landscape.

4. Challenges, Solutions and Lessons Learned

4.1 Challenges and Solutions

During my attachment, I faced several challenges that tested both my technical and soft skills. Below are the main challenges and how I addressed them:

1. **Data Quality Issues**

   o **Challenge:** Many datasets had missing, duplicated, or inconsistent values, which made analysis and modeling difficult.

   o **Solution:** I applied data cleaning techniques using Python and pandas such as handling missing values, removing duplicates, and standardizing formats. I also learned the importance of validating datasets before use.

2. **Understanding Complex Insurance Processes**

   o **Challenge:** As a Computer Science student, the business terminologies and processes in insurance were initially difficult to understand.

   o **Solution:** I regularly consulted with supervisors, researched independently, and took notes during meetings. Over time, I connected technical concepts (like predictive modeling) with insurance-specific applications (like claims prediction).

3. **Debugging and Technical Errors**

   o **Challenge:** When building the chatbot and dynamic website, I encountered bugs such as broken API calls, CORS errors, and misconfigured routes.

   o **Solution:** I adopted systematic debugging: checking logs, testing components step by step, and researching documentation/forums. I also collaborated with colleagues, which improved both the solution quality and my teamwork skills.

4. **Time Management and Multitasking**

- o **Challenge:** Balancing multiple projects (data analysis, chatbot development, website dashboard) within tight timelines was demanding.

- o **Solution:** I created a weekly work plan, prioritized tasks, and used productivity tools like google sheets to stay organized. This improved my efficiency and reduced stress.

5. **User Experience (UX) Design**

- o **Challenge:** Initially, the chatbot and website interfaces were functional but not very user-friendly.

- o **Solution:** I gathered feedback from peers and supervisors, then refined layouts, added better error-handling, and improved navigation in the dashboard.

4.2 Lessons Learned

My attachment was an invaluable journey of personal and professional growth. Some of the major lessons I learned include:

1. **Technical Lessons**

- o The importance of clean data in ensuring reliable analysis.

- o Practical skills in predictive modeling, chatbot development and dynamic website design.

- o Exposure to deployment challenges and the significance of version control (Git/GitHub) in collaborative environments.

2. **Professional Lessons**

- o The need for clear communication when explaining technical ideas to non-technical stakeholders.

- o The role of teamwork and mentorship in overcoming challenges.

- o How structured project planning leads to smoother execution.

3. **Personal Growth**

- o I became more patient and resilient when facing debugging errors or project setbacks.

- o I developed critical thinking by not only identifying problems but also proposing actionable solutions.

- o I built confidence in applying classroom knowledge to real-world problems.

4. **Industry Awareness**

- o I learned how digital tools such as chatbots, predictive analytics, and automated dashboards are reshaping the insurance and financial services sector.

- o I realized that continuous learning is essential, since technology evolves rapidly and requires adaptation.

5. Recommendations

As part of my attachment, I prepared a Recommendations Report outlining possible areas where the company could enhance efficiency, improve customer engagement and leverage technology for growth. While the full report, which I did a presentation to the company, provides detailed strategies, below are some of the key recommendations:

1. **AI-Powered Document Verification (KYC)**

- o Integrate computer vision and AI-based verification tools to automate the Know Your Customer (KYC) process.

- o This would help detect fraudulent or altered documents, reduce manual workload and ensure compliance with regulatory requirements.

2. **Sponsored Posts and Digital Marketing**

- o Introduce sponsored content and targeted ads on the company's website and social platforms.

- o This increases brand visibility among a wider audience and potential customers.

3. **Web Analytics and Tracking Dashboard**

   - o Develop a centralized dashboard for tracking user activity, website traffic and engagement metrics.

   - o Such insights can guide decision-making, improve user experience and help evaluate the effectiveness of marketing campaigns.

4. **Data-Driven Decision Making**

   - o Encourage the use of predictive analytics for areas such as claims management, customer retention and risk assessment.

   - o Leveraging data science would enable proactive business strategies rather than reactive ones.

5. **Regular Technical Training for Staff**

   - o Organize workshops and training sessions on emerging technologies like AI, cloud deployment and cybersecurity.

   - o This ensures employees remain up to date and boosts overall company competitiveness.

6. Conclusion

My industrial attachment provided me with valuable exposure to the real-world application of technology in an organizational setting. Over the course of my attachment, I was able to apply classroom knowledge to practical tasks, gain hands-on experience in system development, digital transformation and data management and build important professional skills such as teamwork, communication and problem-solving.

The experience not only enhanced my technical expertise but also broadened my understanding of how innovation and technology can play a critical role in improving efficiency, enhancing customer experiences, and driving business

growth. I also gained confidence in tackling challenges independently and contributing meaningfully to organizational objectives.

Overall, the attachment has been an eye-opening journey that has significantly shaped my career aspirations and reaffirmed my interest in pursuing a future in data science, software development and artificial intelligence applications.

7. Appendices

The following supporting documents are attached/accompany as part of the appendices to provide evidence of the activities, projects and learning outcomes achieved during the attachment:

1. **Logbook** – A detailed weekly record of tasks and activities undertaken during the attachment.

2. **Screenshots and Photos** – Images of projects developed, system dashboards, and other relevant work-related visuals.