

MD RAIHAN KHAN

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PROFESSIONAL SUMMARY

Technology and project leader with over 10 years of progressive experience spanning UI/UX design, full-stack development, e-Government systems, and public-sector digital transformation across Bangladeshi ministries and EU-funded international initiatives. Proven track record bridging policy objectives and engineering execution to build transparent, equitable, and trustworthy digital public services.

Active independent researcher in trustworthy Artificial Intelligence, with current work focused on hallucination measurement, retrieval-augmented generation (RAG), knowledge graph retrieval, and low-resource Bangla-language Natural Language Processing. Seeking to formalise this expertise through TU Dublin's MSc in Computing in Human Centred Artificial Intelligence to drive the next generation of EU AI Act-aligned, inclusive, and socially harmonious AI systems for public services.

EDUCATION

Bachelor of Science (B.Sc.) in Computer Science and Engineering

North South University, Dhaka, Bangladesh — September 2018 – December 2023

- Relevant Coursework: Artificial Intelligence, Machine Learning, Data Structures and Algorithms, Database Management Systems, Software Engineering, Discrete Mathematics, Probability and Statistics, Operating Systems, Theory of Computation, Computer Architecture, Engineering Mathematics
- Capstone Research: Handwritten Bangla Character Recognition – A Comparative Study (supervised by Dr. Mohammad Ashrafuzzaman Khan)

TECHNICAL SKILLS

Programming Languages: Python, JavaScript, Java, C, C++, SQL, HTML5, CSS3, PHP

Artificial Intelligence and Machine Learning: PyTorch, TensorFlow, Scikit-learn, Hugging Face Transformers, LangChain, OpenCV, ARIMA Time Series Forecasting, Convolutional Neural Networks, Statistical Modelling

Large Language Models and Retrieval-Augmented Generation: LLaMA, Qwen, Gemma, Vector RAG, Knowledge Graph RAG, Hybrid Retrieval Architectures, FAISS, Neo4j, RAGAS Evaluation Framework, Prompt Engineering

Trustworthy AI and Evaluation: Hallucination Measurement, Faithfulness Evaluation, Answer Relevancy, Context Precision and Recall, Semantic Similarity, Data Anonymisation, Privacy-by-Design, EU AI Act Awareness

Natural Language Processing: Bangla NLP, Low-Resource Language Processing, Multilingual Tokenisation, Mixed-Script (Bangla–Latin) Text Processing, Optical Character Recognition (OCR)

User Experience and Visual Design: UI/UX Design, User Interface Development, Visual Branding, Digital Graphics, Web Design, Front-End Prototyping, Client Requirements Translation

Web and Software Development: React, Node.js, Express, REST APIs, Full-Stack Development, Object-Oriented Programming, Software Engineering Principles

Databases and Data Engineering: MySQL, PostgreSQL, MongoDB, Neo4j (Graph Databases), Relational Database Design, ETL Workflows

Tools and Platforms: Git, GitHub, Linux, Visual Studio Code, Jupyter Notebook, Google Colab, ReportLab (PDF Generation), Microsoft Office Suite

Public Sector and e-Government Systems: e-Government Procurement (e-GP), ePMIS, Result-Based Monitoring and Evaluation, Digital Archiving, National Stakeholder Coordination, Project Implementation Support

Project and Programme Management: Cross-Functional Team Coordination, Stakeholder Management, International Logistics, Bilateral Project Delivery, Donor-Funded Programme Execution

PROFESSIONAL EXPERIENCE

IT Manager (July 1, 2025 – Present)

Management and Training International Ltd., Dhaka, Bangladesh

- **Strategic Project Oversight:** Directing technical operations for the “Bangladesh-Bharot Digital Service and Employment Training (BDSET) Center Project” and the “TCMS” software, ensuring robust system performance and seamless user experiences.
- **Digital Preservation Leadership:** Supervising the maintenance and expansion of the “Birir Konthe Birgatha” digital archive, managing data security and integration with National Archives for public access.
- **Consultancy Management:** Coordinated and supported key digital transformation initiatives for the Aspire to Innovate (a2i) program under the ICT Division, specifically managing the “Hiring a Consulting firm for Project Implementation Support at a2i” component.

Senior System Analyst (June 1, 2023 – June 30, 2025)

Management and Training International Ltd., Dhaka, Bangladesh

- **System Architecture:** Engineered and managed the complete data archiving system for “Birir Konthe Birgatha,” a national-level project preserving the testimonies of Bangladesh's freedom fighters.
- **Capacity Building:** Strengthened government monitoring capacity by analyzing and supporting the ePMIS training program for the “Capacity Enhancement for Effective Practice of Result Based M&E System in IMED (CEEPRM & ESI) (1st Revised)” project, improving digital evaluation practices.
- **Digital Transformation:** Supported high-level initiatives for the Aspire to Innovate (a2i) program aimed at building a “smart” government, society and economy.

Programmer (January 1, 2021 – May 31, 2023)

Management and Training International Ltd., Dhaka, Bangladesh

- **EdTech Development:** Developed and maintained the Online Classroom Management system for the iDEA Project (ICT Division), a government initiative supporting digital education and tech innovation.
- **Training Software Engineering:** Engineered and maintained training software for the “Bangladesh-Bharot Digital Service and Employment Training (BDSET) Center Project,” enhancing digital literacy and employment skills.
- **Project Operations:** Coordinated large-scale government initiatives, managing daily operations, optimizing resources, and maintaining comprehensive documentation to ensure project milestones were met.

Assistant Program Officer (January 1, 2018 – December 31, 2020)

Management and Training International Ltd., Dhaka, Bangladesh

- **Program Execution:** Organized and executed customized overseas training programs, study tours, and workshops for high-level officials from various ministries of Bangladesh.
- **International Liaison:** Coordinated logistics by liaising with diverse international stakeholders, including renowned universities and government organizations.
- **Stakeholder Management:** Managed communication, travel logistics, and program documentation to ensure successful project delivery.

Graphic and Web Designer (January 1, 2015 – December 31, 2017)

Crystal Technology Bangladesh Ltd., Dhaka, Bangladesh

- **UI/UX Design:** Designed and developed user-friendly websites and user interfaces (UI) for a leading national ICT organization.
- **Visual Branding:** Created visually engaging digital graphics and branding materials for high-impact client sectors, including enterprise software and hospital automation projects.

- **Client Solutions:** Partnered with development teams to translate complex client requirements into effective, user-centric digital solutions.

PROFESSIONAL PROJECT EXPERIENCE (NATIONAL)

Selected national-level projects delivered under Management and Training International Ltd. as the consulting and implementation partner for various ministries of the Government of Bangladesh.

Hiring a Consulting Firm for Project Implementation Support at a2i

Client: ICT Division, Ministry of Posts, Telecommunications and Information Technology, Government of Bangladesh

- Provided dedicated implementation support to the Aspire to Innovate (a2i) programme, the Government of Bangladesh's flagship initiative for citizen-centric digital service transformation.
- Coordinated technology delivery across multiple e-Government workstreams aligned with the national digital strategy.

Hiring a Firm for Implementing Digital Transformation for Smart Citizens, Government, Society, and Economy

Client: ICT Division, Government of Bangladesh (a2i Programme) | 2024 – 2025

- Delivered technical support for flagship national initiatives focused on building a smart government and a digitally inclusive society.
- Supported smart-city services, citizen engagement platforms, and public-sector digital infrastructure.

Capacity Enhancement for Effective Practice of Result-Based Monitoring and Evaluation System in IMED (CEEPRM & ESI – 1st Revised)

Client: Implementation Monitoring and Evaluation Division (IMED), Ministry of Planning, Government of Bangladesh | 2024 – 2025

- Strengthened government monitoring and evaluation capacity by analysing and supporting the ePMIS training programme for result-based evaluation across ministries.
- Conducted systems analysis to align M&E workflows with international standards, improving data-driven decision making in public investment management.

Birer Konthe Birgatha — Documentaries and Memoirs of Freedom Fighters

Client: Ministry of Liberation War Affairs, Government of Bangladesh | 2023 – Present

- Engineered and managed the complete data archiving system to preserve testimonies, documentaries, and memoirs of Bangladesh Liberation War freedom fighters.
- Ensured system integration with the National Archives, applying digital preservation standards, metadata schemas, and long-term accessibility principles.

Bangladesh-Bharat Digital Service and Employment Training (BDSET) Center Project

Client: ICT Division, Government of Bangladesh | Bilateral Bangladesh–India Initiative | 2021 – Present

- Developed, maintained, and now oversee the core training software for a bilateral Bangladesh–India initiative enhancing digital literacy and employment skills for citizens.
- Delivered the “TCMS” training-content management software supporting nationwide deployment of the BDSET training network.

Innovation Design and Entrepreneurship Academy (iDEA) — 1st Revised

Client: ICT Division, Government of Bangladesh | 2021 – 2023

- Developed and maintained a secure Online Classroom Management System for a national initiative supporting digital education and tech-startup growth.
- Built core modules for user authentication, course delivery, and learner progress tracking serving entrepreneurs and innovators across Bangladesh.

PROFESSIONAL PROJECT EXPERIENCE (INTERNATIONAL)

Selected international project assignments delivered under Management and Training International Ltd., supporting Bangladeshi ministerial delegations and EU-funded cross-border programmes across the European Union.

Views Sharing and Observation about Simulation/Skill Lab, Paris Graduate School

Client: Ministry of Health and Family Welfare, Government of Bangladesh | Locations: France, Italy, Belgium | 2018 – 2020

- Organised and executed a high-level ministerial study tour across three European countries, managing all international logistics and stakeholder coordination.
- Liaised between the Bangladeshi delegation and academic stakeholders in France, Italy, and Belgium to support knowledge exchange on medical simulation and skill-lab infrastructure.

EU Support to Health and Nutrition to the Poor in Urban Bangladesh — International Training Components

Clients: Ministry of Health and Family Welfare; Local Government Division (under MoLGRD); European Union | Locations: Italy, France, Switzerland, Germany | 2018 – 2020

- Executed the international training components of a major EU-funded urban public-health and nutrition project, managing all programme logistics across four European countries.
- Coordinated communication and knowledge transfer between Bangladeshi ministries and European partners across Italy, France, Switzerland, and Germany.

RESEARCH AND ACADEMIC PROJECTS

Benchmarking RAG, Knowledge Graph, and Hybrid Retrieval Architectures on Bangla-Language Regulatory Documents: A Multi-LLM Evaluation Harness for Low-Resource Question Answering

Independent Research Project, 2026

- Built an end-to-end evaluation system that benchmarks three retrieval-augmented generation pipelines — standard vector RAG, Knowledge Graph-based retrieval, and a Hybrid approach — on the Bangladesh Public Procurement Rules 2025 (PPR_2025), a Bangla-language government regulatory document
- Evaluated each pipeline across three open-source Large Language Models from Hugging Face (LLaMA, Qwen, Gemma) using a battery of automatic metrics, with hallucination rate as the primary measure of factual grounding, alongside faithfulness, answer relevancy, context precision, context recall, answer correctness, and semantic similarity
- Developed a Bangla question-answering test harness of several hundred queries with custom mixed-script (Bangla–Latin) PDF reporting to compare all nine pipeline–model combinations
- Technologies: Python, LangChain, Hugging Face Transformers, FAISS (vector search), Neo4j (knowledge graph), RAGAS (evaluation), ReportLab with NotoSans Bengali fonts for mixed-script PDF rendering

The Growing Need for Reliable AI Chatbot Information: Investigating Accuracy, Authenticity, and Up-to-dateness in Conversational AI Systems

Independent Research Project, 2025 | Supervised by Dr. Mohammad Ashrafuzzaman Khan

- Investigated methods to combat misinformation in conversational AI systems, focusing on enhancing information accuracy and authenticity to build public trust in deployed AI services
- Surveyed and evaluated trustworthiness frameworks aligned with emerging AI governance principles, including transparency, factual grounding, and temporal accuracy of generated content

Handwritten Bangla Character Recognition: A Comparative Study

Directed Research / Capstone Project, 2023 | Supervised by Dr. Mohammad Ashrafuzzaman Khan

- Contributed to digital inclusion and the preservation of cultural heritage by conducting a comparative study of neural network models to improve optical character recognition (OCR) for handwritten Bangla
- Compared multiple deep learning architectures on Bangla character datasets, evaluating accuracy, generalisation, and suitability for low-resource language deployment

Student Attendance and Behavior Monitoring in Classroom through Facial Recognition by analyzing Live Video Data

Senior Design Project, 2023 | Supervised by Dr. Mohammad Ashraffuzzaman Khan

- Developed a computer vision system to automate classroom attendance tracking using facial recognition, with a primary research focus on implementing data anonymisation techniques to ensure student privacy
- Designed privacy-preserving processing pipelines aligned with ethical AI principles, demonstrating early commitment to human-centred and rights-respecting AI design

DocuFix: Real Time Mobile Document De Warping and Shadow Removal without Deep Learning

Course Project, 2023 | Supervised by Dr. Shafin Rahman

- Developed a real-time mobile document scanning system using classical computer vision techniques (without deep learning) for de-warping curved pages and removing shadows
- Demonstrated efficient on-device image processing suitable for low-resource mobile deployment, prioritising performance and accessibility over model complexity

“Osud Lagbe” a Web-based E-commerce Application to Purchase Medicine Online

Junior Design Project, 2023 | Supervised by Dr. Ziaul Hossain

- Designed and developed “Osud Lagbe” (“Medicine Needed”), a full-stack e-commerce application improving public access to medicine in Bangladesh by creating a reliable online purchasing platform
- Built end-to-end features including product catalogue, prescription handling, secure checkout, and order management with a focus on usability for non-technical users

“Pizza Lagbe” a Web-based E-commerce Application to Purchase Pizza Online

Software Engineering Project, 2022 | Co-developed with Zannatul Islam Proma | Supervised by Dr. Sarker Tanveer Ahmed Rume

- Co-developed a full-stack web-based food-delivery e-commerce platform with focus on user experience, real-time order management, and structured software engineering practices
- Applied software engineering principles including requirements analysis, modular architecture, and testing throughout the project lifecycle

Bitcoin Price Prediction using Time Series Forecasting Algorithm ARIMA

Course Project, 2021 | Supervised by Dr. Muhammad Arifur Rahman

- Implemented the ARIMA model to analyse and forecast volatile cryptocurrency time series data, demonstrating core proficiency in statistical machine learning and quantitative modelling
- Performed stationarity testing, parameter tuning, and forecast evaluation on real-world Bitcoin price data

Blood Group & Donation Management System

Course Project — Database Systems, 2021 | Supervised by Dr. Nusrat Jahan Chowdhury

- Designed and implemented a relational database management system to streamline blood-donor registration, donation history tracking, and donor–recipient matching
- Modelled normalised schemas, wrote optimised SQL queries, and built a database-driven application supporting public health donation workflows

Credit Card Management System

Course Project — Programming Language II, 2020 | Supervised by Dr. Shafin Rahman

- Developed an object-oriented credit card management application demonstrating core OOP concepts including encapsulation, inheritance, and polymorphism
- Implemented secure transaction handling, account management, and statement generation modules

Banking Record System (BRS)

Course Project — Programming Language I, 2020 | Supervised by Dr. Abu Sayed Mohammad Latiful Hoque

- Built a foundational banking records application handling account creation, deposits, withdrawals, transfers, and balance tracking
- Implemented file-based persistence and structured input validation, establishing core programming and data-handling fundamentals

LANGUAGES

- Bengali (Bangla) — Native proficiency
- English — Full professional proficiency (sole medium of instruction throughout B.Sc. studies at North South University; verified by official Medium of Instruction Certificate)

REFERENCES

Academic Referee

Dr. Mohammad Ashrafuzzaman Khan

Faculty Member, Department of Electrical and Computer Engineering

North South University, Dhaka, Bangladesh

Capstone, Senior Design Project, and Directed Research Supervisor (Bangla NLP, OCR, Privacy-Aware Computer Vision)

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Professional Referee

Dr. Md. Manirul Islam Khan

Managing Director

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