TOUSIF RAHMAN

Built Environment Applied Researcher

Digital Engineering | Digital Twins | Information Management | Data Governance

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PROFESSIONAL SUMMARY

Applied researcher specialising in digital twins and engineering information systems for buildings and infrastructure. Combines an engineering background with experience developing information architectures and connecting models, sensor data and technical prototyping to support monitoring and decisions. Experienced in translating engineering and organisational needs into research frameworks and practical workflows through literature synthesis, stakeholder investigation and multidisciplinary proposal development.

RESEARCH AND TECHNICAL EXPERTISE

- **Research methods**: literature synthesis, gap analysis, stakeholder interviews, workshops, framework development and prototype evaluation.
- **Technical focus:** BIM and digital twins, lifecycle information, database architecture, SQL exchange, Python analysis, data quality and responsible data use.

PROFESSIONAL EXPERIENCE

Scientist & Innovator | Mobility & Built Environment | TNO, Netherlands *Aug 2022 – Present*

Focus: Digital Transformation, Information Management & Technology Adoption

- Developed the IH-PlanTwin data model and rule-based planning prototype, translating zoning, height, setback and buildable-area constraints into programmable logic. Tested integration with TNO's digital twinning platform and authored the project report assessing platform fit, capability gaps and future reuse.
- Co-authored TNO's data-quality assessment for digital-twin applications and investigated its application to Weigh in Motion freight-vehicle data. Developed Python workflows for spatial and temporal filtering, proximity analysis and dwell analysis of location data.
- Assessed market uptake and business opportunities for smart-building technologies under Brains4Buildings, using stakeholder interviews and workshops with SPIE, Philips, Unica and Deerns to identify adoption barriers, commercialisation pathways and standardisation priorities. Co-authored the public evaluation and business opportunity report.
- Developed the system and data architecture for the LoadMap Digital Twin with Rijkswaterstaat, connecting traffic-load data, bridge models and asset information. Coordinated validation sessions with asset-owner teams and engineering consultancies to align technical development with operational needs.
- Contributed to building and infrastructure digital-twin NEXT demonstrators, including a prototype connecting bridge strain measurements to Azure PostgreSQL and Grafana. Developed supporting geospatial workflows for network-data preparation, geometry transformation and interactive mapping.
- Co-developed the Brains4Buildings privacy, security and ethics framework, translating technical, organisational and governance risks into practical guidance for responsible technology use. Co-authored the public report, reviewed by Siemens and the Rijksvastgoedbedrijf.
- Supported the European Commission's Digitalisation of Construction SMEs initiative as trainer and technical expert, delivering workshops to more than 100 SME representatives and contributing to the EU Digital Construction Handbook and technology-adoption guidance.
- Managed TNO's internal KIP DIAMONDS, CKAN and Software Carpentry knowledge-integration project, coordinating work packages, budget reviews, stakeholder communication and activities supporting platform adoption and knowledge sharing.
- Led development of TNO's proposed BuildAI work package, defining research objectives, tasks, partner contributions and expected deliverables for performance evaluation and human–AI collaboration, and aligning these with the wider consortium proposal.

- Translated ISO 19650 principles into practical information structures and common data environment workflows covering metadata, permissions, revision control and approvals to support traceable information exchange.

BIM & Information Specialist | Elea iC d.o.o., Ljubljana, Slovenia *Oct 2020 – Jul 2022*

Focus: GeoBIM, Information Management, Data Integration & Process Digitalisation

Built the company's first structured approach to geotechnical information management, moving borehole, laboratory and design data from document-based exchange into a governed, model-linked environment.

- Designed and developed GeoBIM as an end-to-end workflow for geological and geotechnical information, connecting contractor data capture and validation with database storage, engineering exchange, modelling and visualisation.
- Coordinated with external ground-investigation contractors to understand their working practices and delivery methods, agree information-delivery requirements and support adoption of the GeoBIM framework through standardised templates and guidance. Aligned contractor submissions with internal engineering, modelling and analysis workflows.
- Developed standardised field and laboratory data templates, validation rules and database exchange workflows, supported by user instructions and naming conventions, to enable consistent information delivery and reuse across engineering tools.
- Adapted GeoBIM for the IC Malmö project, developing a 14-table schema, investigation-specific templates and structured exchange outputs for multiple test methods, supported by dashboard prototypes.
- Authored a proposal for a Slovenian geological and geotechnical data platform, defining work packages for standardisation, database architecture, web access and use-case testing.

PROFESSIONAL CERTIFICATIONS & DEVELOPMENT

- **RICS Certificate in Information Management Using BIM** | RICS 2026 | In progress
- **APMG Change Management Foundation & Practitioner** | APMG International 2026 | In progress
- **RICS Harnessing AI & Data in the Built Environment |** RICS 2026
- **EU Horizon Proposal Development Masterclass** 2024
- **Project & Quality Management Training.** 2023

Additional EXPERIENCE

- **Founder, TRS Consultancy and Agency Ltd.** 2025 - Present.
  Developing digital transformation and information-management services.
- **Lecturer** | North South University, Dhaka, Bangladesh. *Jan 2017 – Sep 2019*
  Delivered civil engineering courses with a focus on core subjects and applied problem-solving.
- **Geotechnical Engineer** | Prompt Engineering Pty Ltd, Perth, Australia *Dec 2015 – Jun 2016*
  Conducted PLAXIS 2D stability and settlement analyses; authored geotechnical assessment reports and supervised field testing.
- **Foundation Engineer** | DDC, Dhaka, Bangladesh *Mar 2014 – Feb 2015*
  Contributed to Dhaka Metro Rail Line-6 foundation design and model-based documentation, supporting multi-stakeholder coordination.

EDUCATION

- **Joint Erasmus MSc, Building Information Modelling** *2020*
  University of Ljubljana & University of Minho
  Thesis: Geotechnical Data Management in BIM Environment | Thesis grade: 9/10
  Average grade: 9.67/10 Supervisor: Prof Janko Logar

- **MSc, Geotechnical Engineering** *2013*
  Newcastle University, United Kingdom
- **BEng (Hons), Civil Engineering** *2012*
  Cardiff University, United Kingdom

TECHNOLOGY & RESEARCH TOOLS

- **Built Environment:** Autodesk Revit, Navisworks, Solibri, BIM 360, Dalux
- **Data, Analytics & Cloud:** Power BI, PostgreSQL, Python, Azure, CKAN, QGIS
- **Digital twin interfaces:** Autodesk Tandem, CKAN and Grafana; connecting models and monitoring data for exploration and decision support.
- **Engineering and spatial models:** Revit, gINT, Leapfrog and QGIS for BIM, ground-data reporting, geological models and spatial context; Slide2 and PLAXIS 2D for geotechnical analysis.

SELECTED PUBLICATIONS

- Chochanova, E. & Rahman, T. (2025). Integrating Privacy, Security, and Ethics in Smart Buildings: A Practical Framework for Digital Resilience. *REHVA Journal*, 06/2025, pp. 9–13.
- Rahman, T., Chochanova, E., Chamari, L. & Maassen, W. (2025). Evaluation and Business Opportunity Report, including Recommendations for Standardisation. Brains4Buildings consortium, public report.
- Rahman, T. & Chochanova, E. (2023). Privacy, Security and Ethics Framework for Smart Buildings. Brains4Buildings consortium, public report.