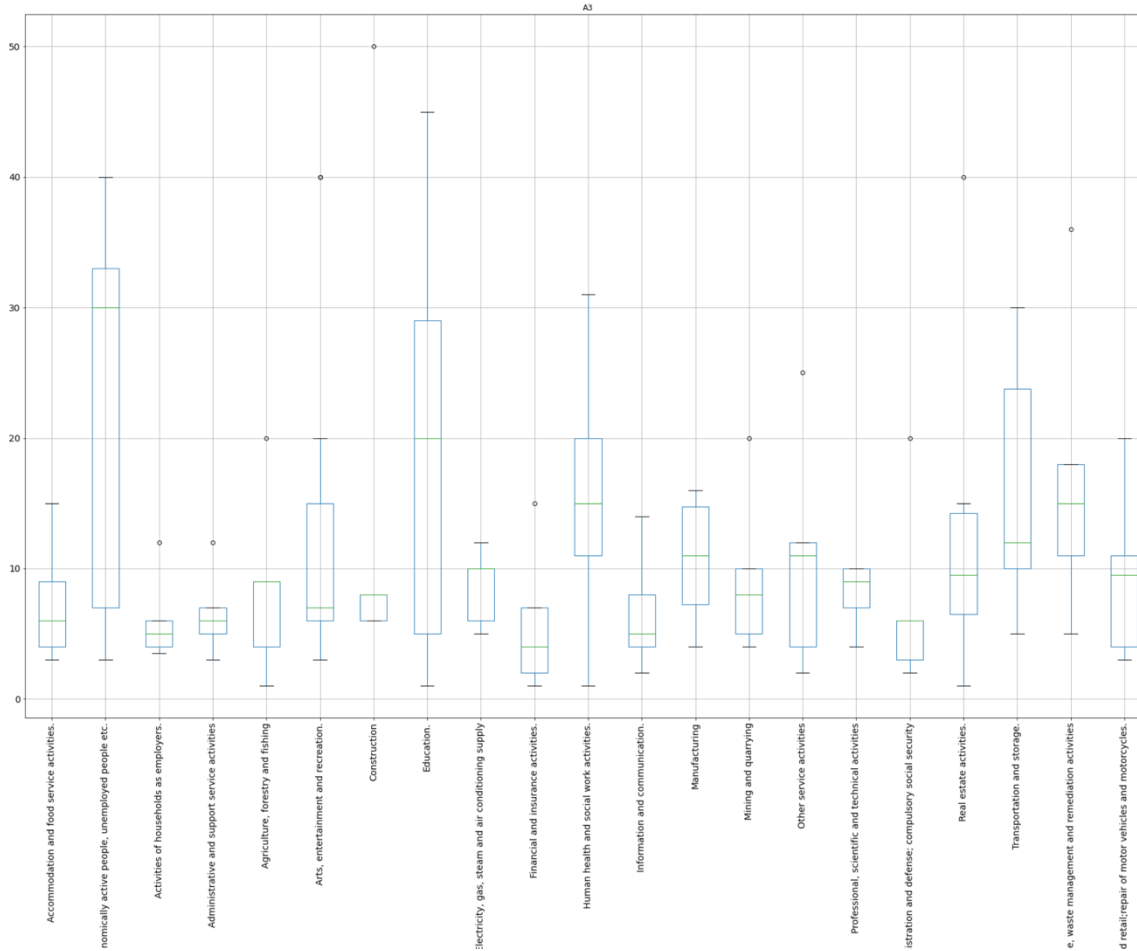


01- Digital Behaviors - Organizations and Government

Problem Statement

Rationale



In organising and studying the data provided under the dataset - “01.Digital behaviours: organisations and government” we conducted the following process to arrive at the problem statement.

Step 1 - We cleaned the data and got it into a form suitable for analysis.

Step 2- We looked at the experience level of managers each industry.

Step 3 - We clustered the data by industry

Step 4 - We looked at the challenges relating to the use of digital technologies in the workplace to assert the biggest challenge

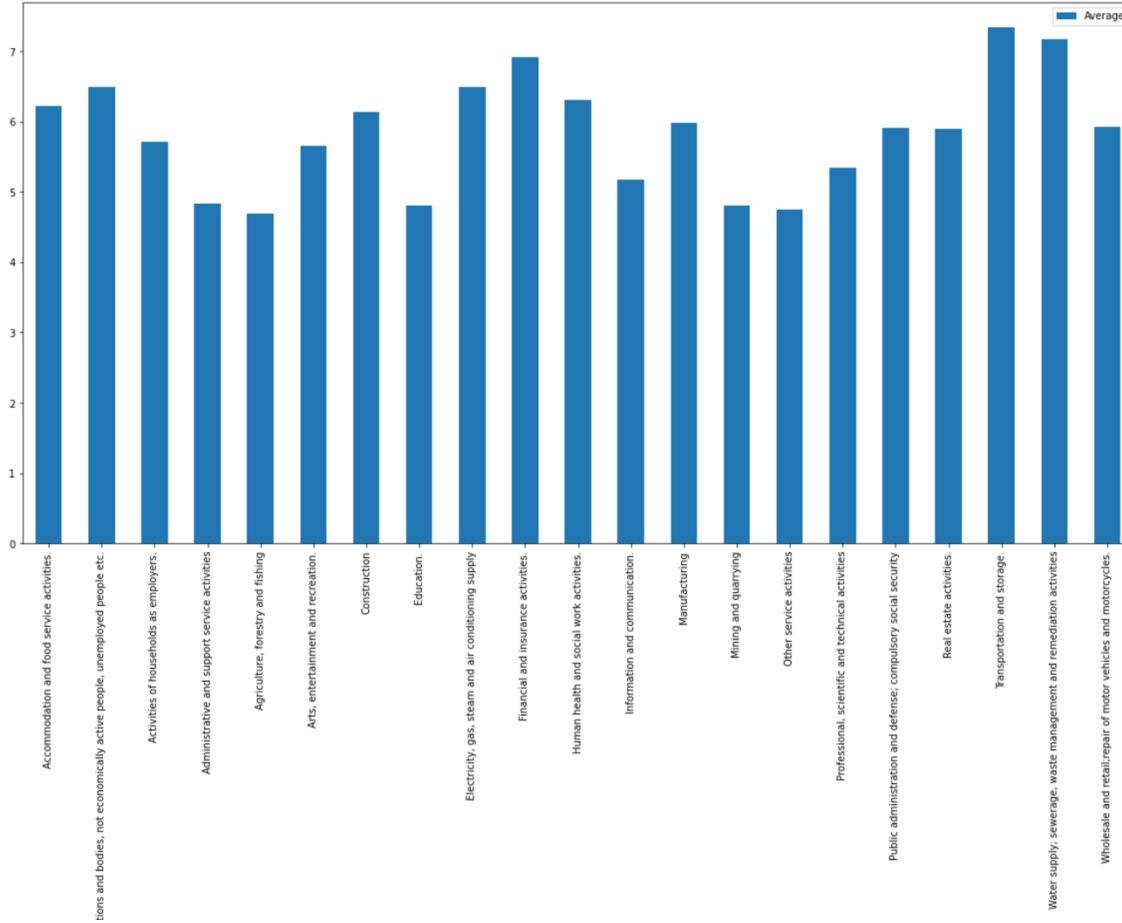
Step 5 - We looked at the benefits of using digital technologies in the workplace to assert the biggest benefit

Step 6 - We looked at most managers are doing to improve technology adoption, to determine areas of improvement.

Having collected sufficient data, it becomes possible to model problems faced by industries.

The graph to the right shows a whisker plot of the average experience of managers per industry, with *Construction, Education, human health and social work activities, transportation and storage, and extraterrestrial organisations* having the most experienced respondents.

Problem Statement Rationale

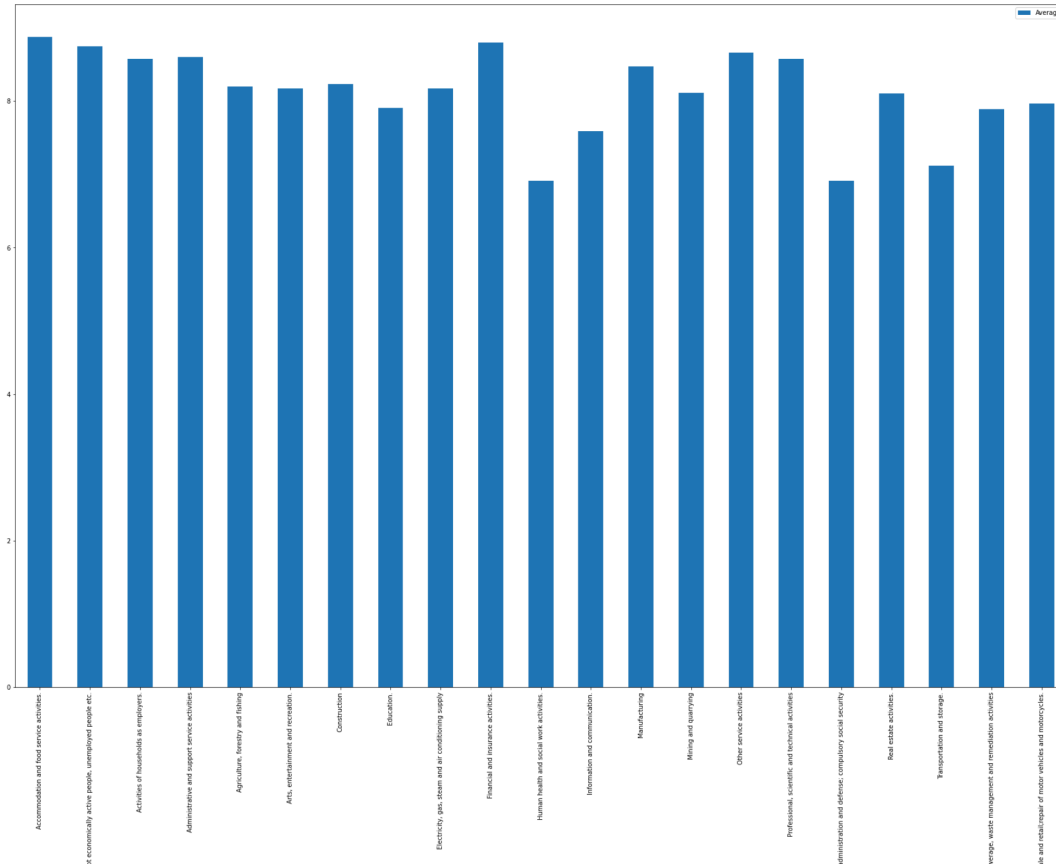


The graph below shows the overall average rating of digital challenges in industry as observed by managers per industry, with *Water supply; sewerage, waste management and remediation activities* and *Transportation and Storage* industries being the top 2 industries facing most digital challenges.

Problem Statement

Rationale

Amongst these industries, it is evident from the graph below which shows the average benefit rating derived from using digital technologies, that the *Water supply; sewerage, waste management and remediation activities* industry is set to derive the most value from using digital technologies



Problem Statement

Rationale

Further exploration/analysis of the data, shows that most managers within the *Water supply; sewerage, waste management and remediation activities* industry feel that The instability of digital systems (systems going down, load shedding etc.) is their biggest concern, with an overall rating of 10 out 10.



Problem Statement

Rationale

However *Water supply; sewerage, waste management and remediation activities* industry manager feel that using digital technologies will allow them the Ability to manage and monitor teams, activities, projects etc., while not being physically present. This is shown in the graph below with a benefit rating of 8 out of 10.



Problem Statement

Rationale

However *Water supply; sewerage, waste management and remediation activities* industry manager feel that using digital technologies will allow them the Ability to manage and monitor teams, activities, projects etc., while not being physically present. This is shown in the graph below with a benefit rating of 8 out of 10.



Problem Statement

Rationale

As a result, the following conclusions can be drawn from the data mentioned above: years of experience doesn't have an impact on the problems faced, the averages show that *Water supply; sewage, waste management and remediation activities* industry feel the most challenged by digital technology particularly. However should digital technology be adopted, the material benefit would be seen in the ability too manage and monitor teams, activities projects etc from a remote location whichout requirement for physical presence.

Problem Statement

Description

Figure 3: Water use in South Africa

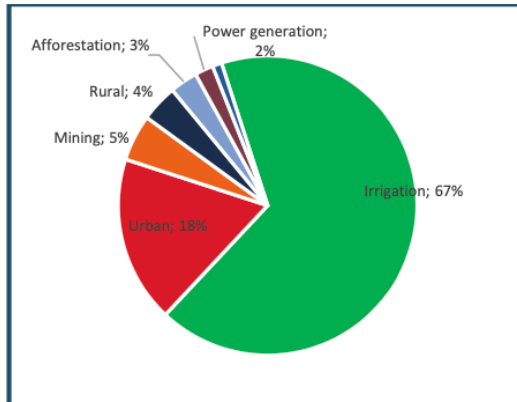
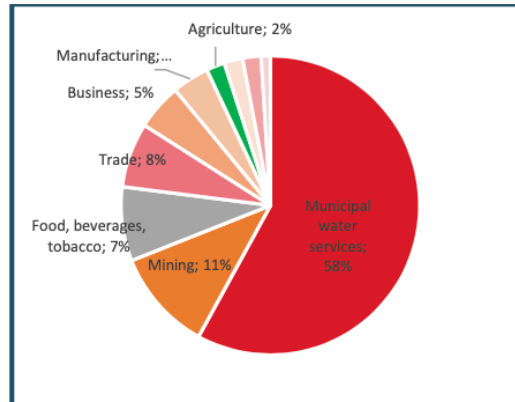


Figure 4: Financial value of water sales in South Africa



Source: Montmasson-Clair and Mudombi (2020) based on data from DWS.

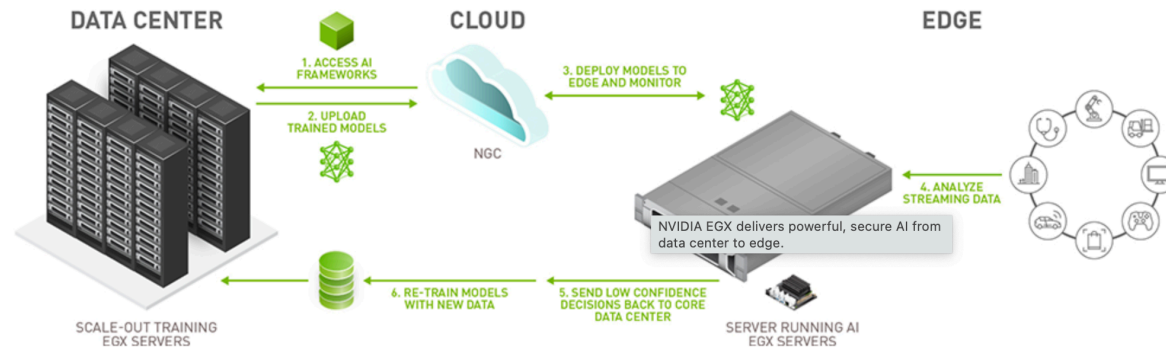
Nelson Mandela Bay Municipality, according to a News24 article published in Septer of 2020, is facing serious water supply crisis. The challenges faced are due to low water reservoir levels in the 5 supply Dams nearby as well infrastructure related issues such as pipe leakages and slow leakage detection.

These present Local, provincial and Natianal Governement with the following chalalneges:

- Failure to Meet Muniapal Service Level targets
- Loss of Municipal Revenue
- Polttuion/contamination of watersupply lines
- Unexpected expenditure
- High Labour requirement for unexpected repairs

As a result, a low-cot solution is required that will allow the Nelson Mandela Bay Municipality to remotely monitor and detect leakages in real-time in order to minimise the impacts of interrupted water supply.

Solution Description



We Propose the use of Artificial Intelligence at the Edge to remotely monitoring and detection of water supply infrastructure. The approach will entail the deployment of sensors to key infrastrucre and infrastructure point to conduct unsupervisedd monitoring of pipes, valves and meters.

The sensor network will be connected to a local edge server which conducts automated analysis of the sensor data presented. If a fault is detected, an automated report will be generated and a ticket lwill be logged with the municipality.

Benefits of the approach:

- Low operational Expenditure
- Low Data Consumption
- Bandwidth Optimisation
- Realtime visibility of entire infrastructure
- Autonomous condition monitoring and reporting

A similar approach has been employed by the Narula institute of technology See link for case study:

https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3526004

