**Problem definition**

Hospitals and clinics in many communities face the persistent challenge of long queues, which delay access to care, overwhelm healthcare staff and reduce overall patient satisfaction. Patients with low risk often wait the same amount of time as those with high risk, leading to overcrowding and misallocation of resources. This inefficiency is partly due to the lack of effective classification and prediction tools that can quickly identify high-risk patients who need urgent attention. In hospitals people must wait to create a file, which takes time before they get medical attention.

By applying AI to patient intake and clinical data, hospitals can automatically predict which patients are at higher risk of complications or deterioration. This allows healthcare staff to prioritise urgent cases, streamline resource allocation, and reduce unnecessary waiting times. For the local municipality, the benefits are significant, improved community health outcomes, better use of limited medical staff, and reduced frustration among patients. This AI-driven solution ensures that vulnerable individuals receive timely care while maintaining a smooth patient flow in hospitals and clinics.

**Business objectives:**

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The primary objective of the AI solution is to predict patient risk levels at the point of entry, enabling hospitals and clinics to classify more effectively, reduce waiting times, and optimise community healthcare delivery. At the same time, we aim to develop a chatbot that ask patients for basic information and symptoms and then provide them with a unique patient ID. In this way, the system support doctors and administrators in resource planning and decision -making.

**Business Success Criteria**

**Business background**

CarePredictAI is a smart patient management system built to ease the pressure on South African healthcare facilities. Instead of forcing everyone to wait in the same long queues before receiving medical attention, the system uses patient symptoms to sort people into clear categories such as critical (high risk), moderate, or normal (low risk) and uses a chatbot check-in system. Behind the scenes, CarePredictAI runs on Python-based machine learning models, trained with medical datasets. Looking ahead, the solution can be scaled to clinics and hospitals across the country, creating a fair, faster, and more reliable way to manage patient care.

**Requirements**

For our project to work, we need patient datasets that include admissions, diagnoses, and demographics because these will be used to train and test the AI model. Hospital staff will also need proper training so that they can use the chatbot and AI system effectively in a real environment. A secure way of storing patient data is required to make sure sensitive information is protected and kept private. On the technical side, we need machine learning models to process the data and make predictions, and we will be using Python as the main programming language since it has powerful libraries and tools for AI development.

**Constraints**

Our solution has some constraints. The dataset may have missed or imbalanced records. Limited availability of high-quality patient data. Resistance to change from healthcare staff. Infrastructure limitations in rural or underfunded clinics. Ethical concerns regarding bias and fairness in AI predictions. Lastly, government acceptance is also a constrain, because the system can only be used if it follows healthcare regulations and policies, and approval processes may take time or face restrictions.

**Risks**

We also considered risks that could affect the project. Technical risks include the possibility of the model overfitting or being slow to train on large datasets. Ethical risks come from the possibility that people may misuse predictions without proper doctor oversight and incorrect predictions may delay critical care if not monitored. Data privacy breaches could compromise patient trust. The cost of implementation may be high for resource-limited hospitals.

**Tools and Techniques**

* PyCharm: main development environment to build and test the python code for the AI model and chatbot
* SQL: storing and managing patient data securely
* PowerPoint: for presentation, we will use this tool to summarize our solution and explain it visually.
* GitHub: used for version control and group collaboration
* Self-service kiosk or queue management system: acts as a device where patients enter their ID and get directed to the right queue.

**AI Solution**

CarePredictAI utilises artificial intelligence to help hospitals and clinics manage patients more effectively. When a patient registers, the system gives them a chatbot linked to their medical profile. The chatbot system will allow a patient to enter details such as name, age, and symptoms, after which the AI model will estimate their risk level. The chatbot will then generate a unique patient ID, which can also be linked to a self-service digital kiosk or queue management system at the hospital entrance, where patients enter their ID to confirm their details and join queue automatically. This reduces waiting times and help staff organize patient based on their information.

The solution applies machine learning in healthcare, which is a part of the project theme *“AI Solution for Industries”.* The model is trained on medical datasets and simulated patient records, and its accuracy is tested to make sure results are reliable. The chatbot applies natural language processing for patient interaction, and the patent ID system ensure that the solution is practical for real-worlds use by allowing hospitals to quickly identify and retrieve patient information during check-in.

By combining AI risk prediction and patient identification system, CarePredictAI provides a fair and efficient healthcare solution that can be deployed in hospitals and clinics across South Africa.

**Conclusion**

our project shows how AI can help solve real problems in the healthcare industry. By predicting patient risk levels and reducing waiting lines through a chatbot check-in system, we can improve hospital efficiency and save lives. Even though the project is a prototype with some limitations, it demonstrates how technologies from the fourth industrial revolution can be used to make a real impact on people’s lives in South Africa and beyond.