

SMART BMI CALCULATOR BOT

A PROJECT REPORT

Submitted by

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BONAFIDE CERTIFICATE

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ABSTRACT

"The Smart BMI Calculator Bot" is an innovative Robotic Process Automation (RPA) solution designed to streamline the health assessment process by automating BMI calculations. This intelligent bot, developed using UiPath, simplifies the evaluation of patient health metrics by leveraging data scraping and automation. Users provide an input Excel file containing patient details such as height and weight, and the bot processes this data by automating input into an online BMI calculator.

The bot retrieves the calculated BMI values and updates the original Excel file with the results. Additionally, it categorizes each BMI value into classifications such as "Underweight," "Normal," "Overweight," or "Obese," ensuring a comprehensive health report. By meticulously automating the workflow, this project eliminates manual calculations, reduces errors, and improves efficiency in large-scale health assessments.

"The Smart BMI Calculator Bot" ensures swift, accurate, and consistent BMI evaluations, addressing the needs of healthcare professionals managing bulk data. By combining RPA capabilities with intelligent health analytics, this project significantly reduces manual effort while enhancing the accuracy and reliability of BMI calculations.

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LIST OF ABBREVIATIONS

ABBREVIATION	ACRONYM
RPA	Robotic Process Automation
AI	Artificial Intelligence
API	Application Programming Interface
CV	Computer Vision
BMI	Body Mass Index

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

"The Smart BMI Calculator Bot" represents an innovative solution at the intersection of Robotic Process Automation (RPA) and healthcare analytics. In the evolving landscape of healthcare, managing bulk data to calculate and assess BMI efficiently is a critical challenge. This intelligent bot, developed using the UiPath platform, serves as a comprehensive tool designed to automate BMI calculations and streamline health assessments.

For healthcare professionals and institutions handling extensive patient datasets, this bot offers a transformative approach. By automating the process of inputting patient details into an online BMI calculator, retrieving results, and categorizing BMI values into health classifications such as "Underweight," "Normal," "Overweight," or "Obese," the bot enhances the speed, accuracy, and reliability of health evaluations. It addresses the growing need for automated solutions in the healthcare sector to reduce manual errors and save time.

UiPath specializes in software that automates repetitive digital tasks traditionally performed by humans. The technology integrates AI-powered computer vision with APIs, enabling users to automate routine processes efficiently. UiPath's platform provides access to pre-built automation components, empowering users to build workflows that handle repetitive tasks across various domains.

The UiPath Automation Platform, which combines low-code tools in the Studio IDE with client-side Robots for task execution, forms the backbone of this project. Utilizing the platform's capabilities, "The Smart BMI Calculator Bot" automates patient data processing, reduces manual effort, and ensures consistent, accurate BMI assessments. This innovative solution highlights the power of RPA in advancing healthcare processes, providing a reliable, scalable tool for improving operational efficiency.

1.2 OBJECTIVE

The primary objective of "The Smart BMI Calculator Bot" is to revolutionize the health assessment process. By leveraging Robotic Process Automation (RPA), the bot aims to automate the calculation and categorization of Body Mass Index (BMI) for bulk patient data. The project seeks to provide healthcare professionals and institutions with an efficient and accurate solution for managing large-scale health evaluations, reducing manual effort, and ensuring consistency in results.

1.3 EXISTING SYSTEM

In the current healthcare landscape, calculating and categorizing Body Mass Index (BMI) for large volumes of patient data is a manual and time-consuming process. Healthcare professionals often face the challenge of managing bulk data, performing repetitive calculations, and ensuring accuracy in health assessments. This process requires meticulous effort and can be prone to errors, placing a significant burden on healthcare institutions. The need for a streamlined and automated solution to enhance the efficiency and accuracy of BMI evaluations is evident.

1.4 PROPOSED SYSTEM

"The Smart BMI Calculator Bot" is envisioned as a transformative solution to the existing challenges in health assessment automation. By utilizing UiPath's RPA capabilities, the bot will systematically process patient data from an input Excel file, automating the entry of height and weight details into an online BMI calculator. The bot will retrieve the calculated BMI values and categorize them into classifications such as "Underweight,"

"Normal," "Overweight," or "Obese."

The proposed system aims to significantly reduce the manual effort required for BMI calculations, offering healthcare professionals a tool that ensures swift, consistent, and accurate health assessments. The bot's capabilities extend to generating updated Excel reports, including details such as patient names, BMI values, and corresponding health classifications. Through this project, we aspire to introduce a new era of healthcare automation, where technology enhances the efficiency and reliability of patient evaluations.

CHAPTER 2

LITERATURE REVIEW

2.1 Survey on Robotic Process Automation (RPA) in Healthcare:

Robotic Process Automation (RPA) is being increasingly applied in healthcare to streamline various administrative and operational tasks. In the context of health assessments, RPA has been successfully implemented for automating data entry, appointment scheduling, and billing, reducing the manual effort required by healthcare professionals. However, challenges still exist, particularly when it comes to automating complex tasks that require interpretation and human judgment. The literature review of research papers related to RPA in Healthcare is listed below:

[1] A research paper from the International Journal of Healthcare Informatics explores the implementation of RPA in healthcare for automating patient record management and appointment scheduling. It concludes that RPA significantly reduces administrative burdens, increases process efficiency, and improves patient satisfaction, ultimately allowing healthcare workers to focus on patient care.

[2] Another study published in the Journal of Healthcare Technology discusses the role of RPA in automating billing and insurance claim processes. The research highlights how automation accelerates workflows and improves accuracy, leading to cost savings and enhanced operational efficiency.

2.2 Survey on Automated BMI Calculation:

The automation of BMI calculations has received attention in healthcare as a way to enhance accuracy and efficiency. Several studies explore the use of digital tools and AI-driven systems to automate health assessments, including BMI calculations. These tools help healthcare providers make faster decisions based on data inputs. However, challenges still persist in integrating these tools with existing healthcare systems, ensuring data privacy, and improving user interfaces. The literature review of research papers related to automated BMI calculation is listed below:

[2] A study conducted by the Health Informatics Research Group focuses on developing an automated BMI calculation tool that integrates with electronic health records (EHR). The research concludes that automated BMI calculation reduces errors, improves consistency in health assessments, and enhances clinical decision-making processes.

[3] In another study, researchers from the University of Health Sciences analyze the application of AI and machine learning in automating health assessments like BMI calculation. The study highlights how AI-driven tools can make health assessments more accessible and reduce the burden on healthcare professionals. The study also mentions the importance of ensuring patient data privacy and security when using such automated tools.

2.3 Survey on RPA in Health Data Automation:

RPA has also been explored in the context of automating health data workflows, especially those related to patient health records and diagnostic results. The use of RPA in automating the flow of health data from different sources to unified platforms can significantly reduce administrative workloads and improve the accuracy of health data reporting. However, there are challenges in ensuring that such automation adheres to privacy and regulatory standards. The literature review of research papers related to RPA in health data automation is listed below:

[3] The paper from the International Journal of Medical Informatics presents an RPA solution to automate the extraction and processing of health data from patient records. The research highlights the efficiency gains and reduction in errors that RPA offers in healthcare data management, thus supporting faster decision-making processes.

[4] Another research paper from the Journal of Health Management discusses how RPA can assist healthcare organizations in automating the reconciliation of health data, from insurance claims to clinical reports. The research emphasizes the importance of seamless integration between RPA and existing health information systems to ensure data integrity and compliance with regulations.

2.4 Summary of the Intersection of RPA, Automated Health Calculations, and Health Data Management:

"The Smart BMI Calculator Bot" bridges these areas, utilizing RPA to automate the BMI calculation process. By processing patient data from an input Excel file, the bot enters details into an online BMI calculator, retrieves the results, and categorizes the patients based on health classifications. This automation reduces the manual effort involved in health assessments while ensuring accurate, consistent results.

The project also integrates with external services for data processing, addressing challenges in managing large datasets and automating repetitive health tasks. This intersection of RPA, automated health calculations, and data management positions the project as a leading solution to modernize healthcare workflows.

This innovative approach aligns with ongoing research in the healthcare automation space, offering a timely solution to streamline health assessments, improve operational efficiency, and reduce human error in healthcare settings. The combination of RPA and automated BMI calculations showcases the project's potential in contributing to the digital transformation of healthcare.

CHAPTER 3

SYSTEM DESIGN

3.1 SYSTEM FLOW DIAGRAM

A flowchart is a type of diagram that represents an algorithm, workflow or process. The flowchart shows the steps as boxes of various kinds, and their order by connecting the boxes with arrows. This diagrammatic representation illustrates a solution model to a given problem. The system flow diagram for this project is in Fig. 3.1.

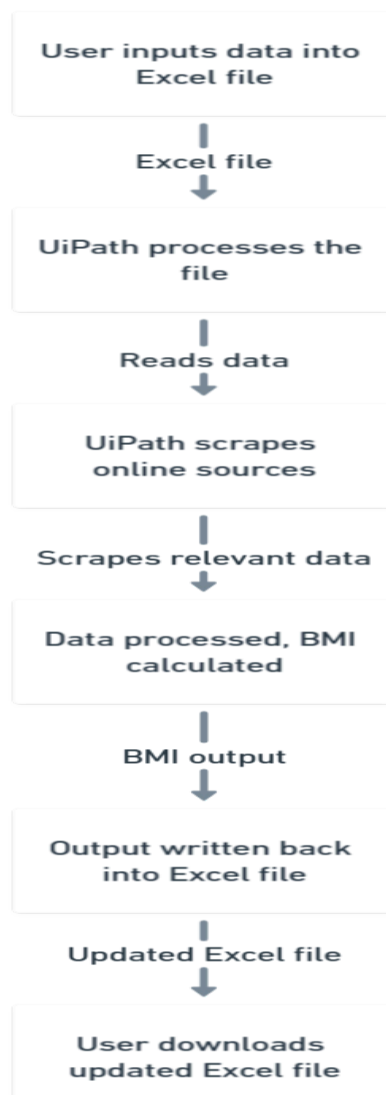


Fig 3.1 System Flow Diagram

3.2 ARCHITECTURE DIAGRAM

An architecture diagram is a graphical representation of a set of concepts that are part of an architecture, including their principles, elements and components. The architecture diagram for this project is in Fig. 3.2.



Fig 3.2 Architecture Diagram

3.3 SEQUENCE DIAGRAM

A sequence diagram is a type of interaction diagram because it describes and shows in what order a group of objects works together. The sequence diagram for this project is in Fig. 3.3.

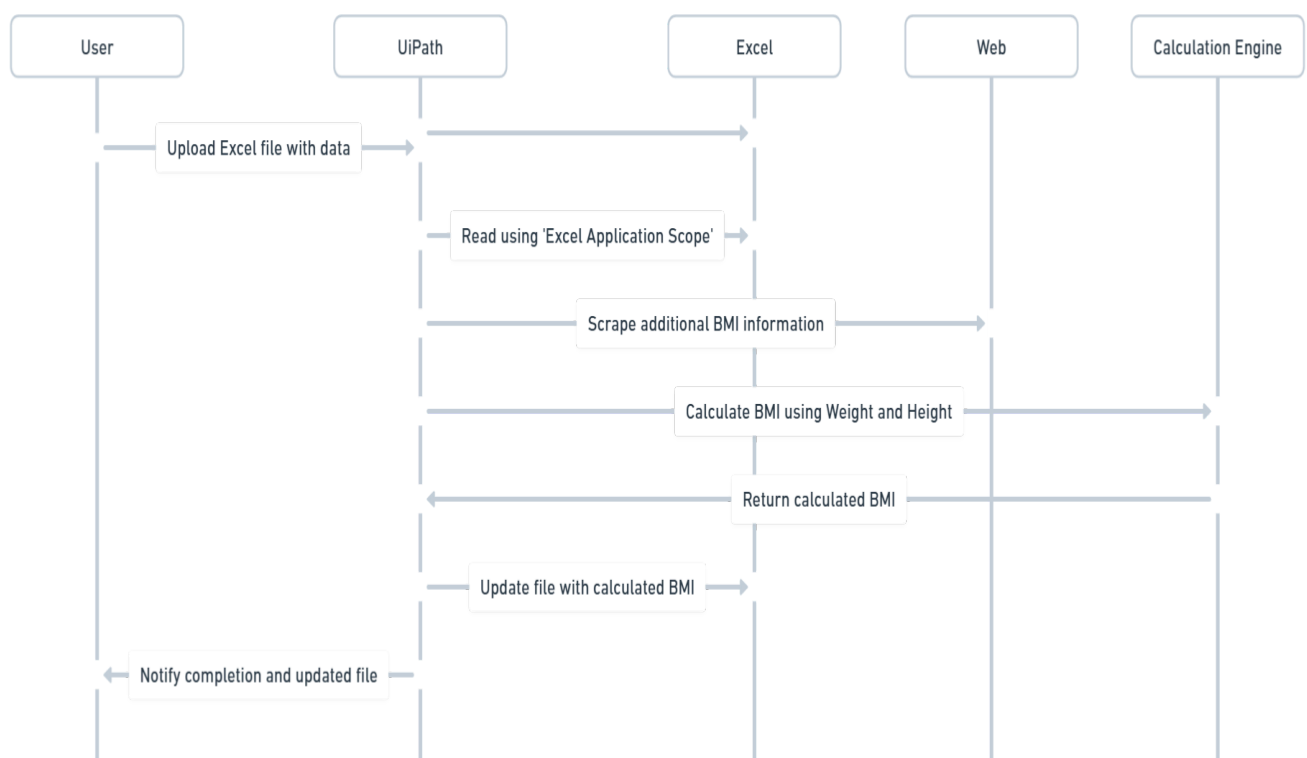


Fig 3.3 Sequence Diagram

CHAPTER 4

PROJECT DESCRIPTION

"The Smart BMI Calculator Bot" is an advanced Robotic Process Automation (RPA) solution designed to automate the BMI calculation process in healthcare. Developed using UiPath, this bot processes patient data, automates BMI calculations, and categorizes the results efficiently. It aims to assist healthcare professionals by streamlining the patient health assessment process, improving accuracy, and reducing manual effort.

4.1. MODULES:

4.1.1. INPUT HANDLING AND INITIALIZATION:

4.1.1.1. Excel File Selection:

- Receive user input for the path of the Excel file containing patient details.

4.1.1.2. Patient Data Extraction:

- Parse the patient details (age, weight, height) from the selected Excel file.
- Ensure the data is formatted correctly for BMI calculation.

4.1.1.3 Result File Creation:

- Dynamically create an output Excel file within the same directory to store BMI results.
- Include columns for patient details and BMI classification (e.g., underweight, normal weight, overweight).

4.1.2 CONTENT ANALYSIS:

4.1.2.1 BMI Calculation:

- Iterate through each row in the Excel file and extract patient data (weight, height, age).
- Calculate the BMI using the formula: $BMI = \text{weight (kg)} / \text{height}^2 (\text{m}^2)$.

4.1.2.2 Result Categorization:

- Classify each patient's BMI according to standard health categories (e.g., underweight, normal weight, overweight, obese).

4.1.3 RESULT MANAGEMENT:

4.1.3.1 Result Storage:

- Update the output Excel file with calculated BMI results and their respective classifications.

4.1.2.3 Real-time Update:

- Display real-time updates of the BMI calculation process on the user interface.

4.1.4 COMPLETION AND REPORTING:

4.1.4.1 Completion Message:

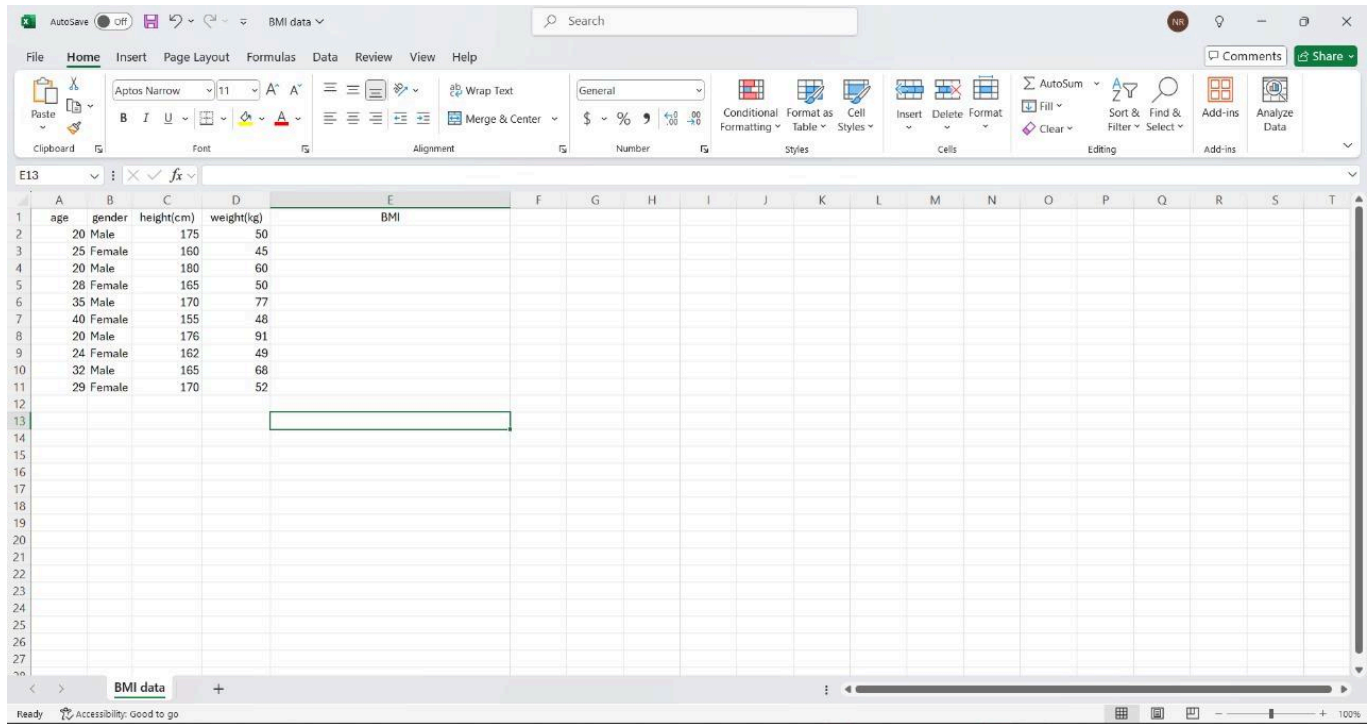
- Conclude the operation with a success message indicating that the BMI calculations and classifications have been completed.

4.1.4.2 Report Generation:

- Provide the user with a link to download the completed Excel report with patient BMI data and classifications.

CHAPTER 5

OUTPUT SCREENSHOTS



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E
1	age	gender	height(cm)	weight(kg)	BMI
2	20	Male	175	50	
3	25	Female	160	45	
4	20	Male	180	60	
5	28	Female	165	50	
6	35	Male	170	77	
7	40	Female	155	48	
8	20	Male	176	91	
9	24	Female	162	49	
10	32	Male	165	68	
11	29	Female	170	52	
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Fig 5.1 – Excel File Creation
The bot creates an excel file report in the main directory for the selected folder as shown

No	Name	Department	EmpCode	DOJ	BloodGroup
1	Brittney Carignan	Human Resource	50886	12-Feb-22	O +ve
2	William Middlebrooks	Purchase	28438	12-Feb-22	A +ve
3	Sarah Neighbors	Purchase	22137	14-Mar-22	B +ve
4	Henry Hunter	Marketing	23915	15-Feb-22	O +ve
5	Daniel Padillo	Finance	39636	16-Mar-22	AB +ve
6	Sharon Becerra	Finance	67564	17-Feb-22	O +ve
7	Leah Gibbs	Human Resource	66089	02-Mar-22	O +ve
8	Rosie Pica	Finance	84162	19-Jan-22	A -ve
9	Robert Conner	Marketing	46141	20-Feb-22	O -ve
10	Angelia Cartee	Sales	94396	21-Feb-22	AB -ve
11	Marie Burgess	Marketing	56066	02-Mar-22	O +ve
12	Clara Smith	Human Resource	95185	23-Feb-22	AB +ve
13	Sidney J. Norman	Human Resource	13457	24-Feb-22	O +ve
14	Wayne K. Hicks	Finance	13457	25-Feb-22	A +ve
15	Rudy McDade	Marketing	13457	25-Feb-22	B +ve
16	Sheila Dever	Human Resource	66089	10-Feb-22	O +ve

Fig 5.3 – Excel Report

The results are then updated to the excel file that was created at the early steps of execution and saved as it is shown in Fig 5.3

CHAPTER 6

CONCLUSION

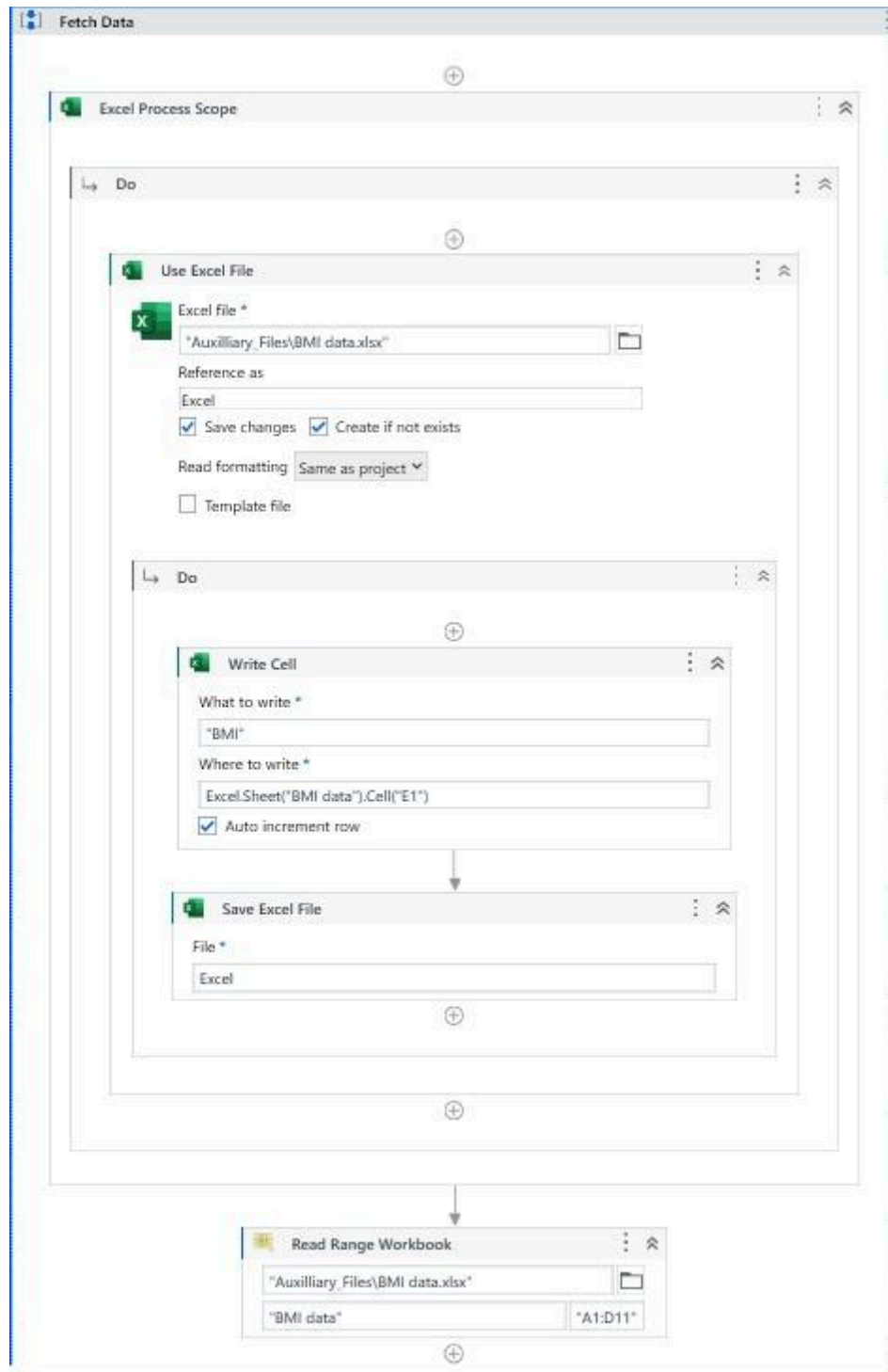
"The Smart BMI Calculator Bot" revolutionizes healthcare automation by leveraging UiPath's Robotic Process Automation (RPA) to address the challenges of manual BMI calculations and data management. This innovative solution streamlines patient data processing, ensuring consistency, efficiency, and accuracy.

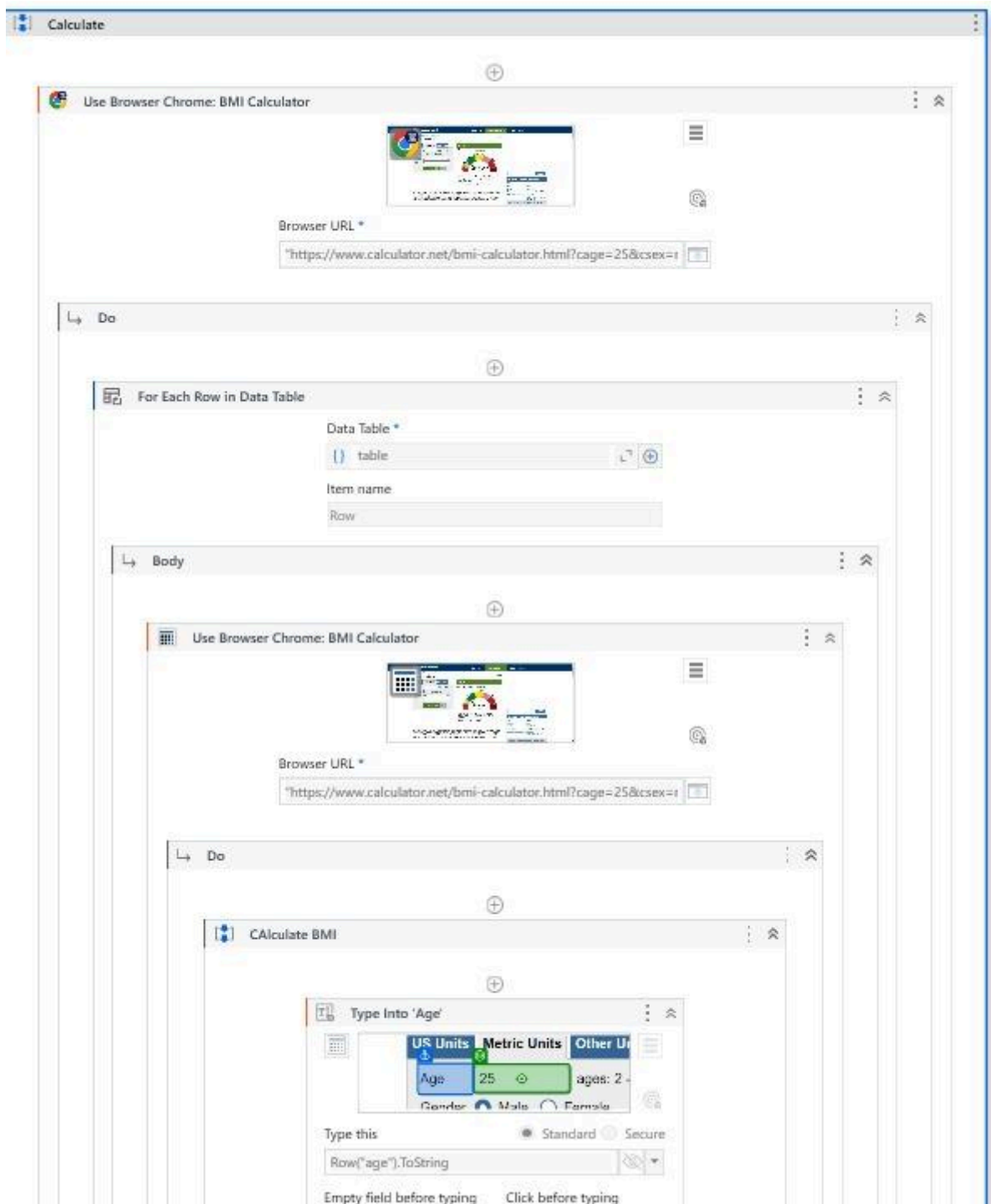
The project's real-time updates enhance transparency during health assessments, providing healthcare professionals with a user-friendly interface for systematic documentation in the Excel report ("Patient Report"). By automating repetitive tasks like data entry and calculations, the bot allows professionals to focus on providing personalized healthcare recommendations.

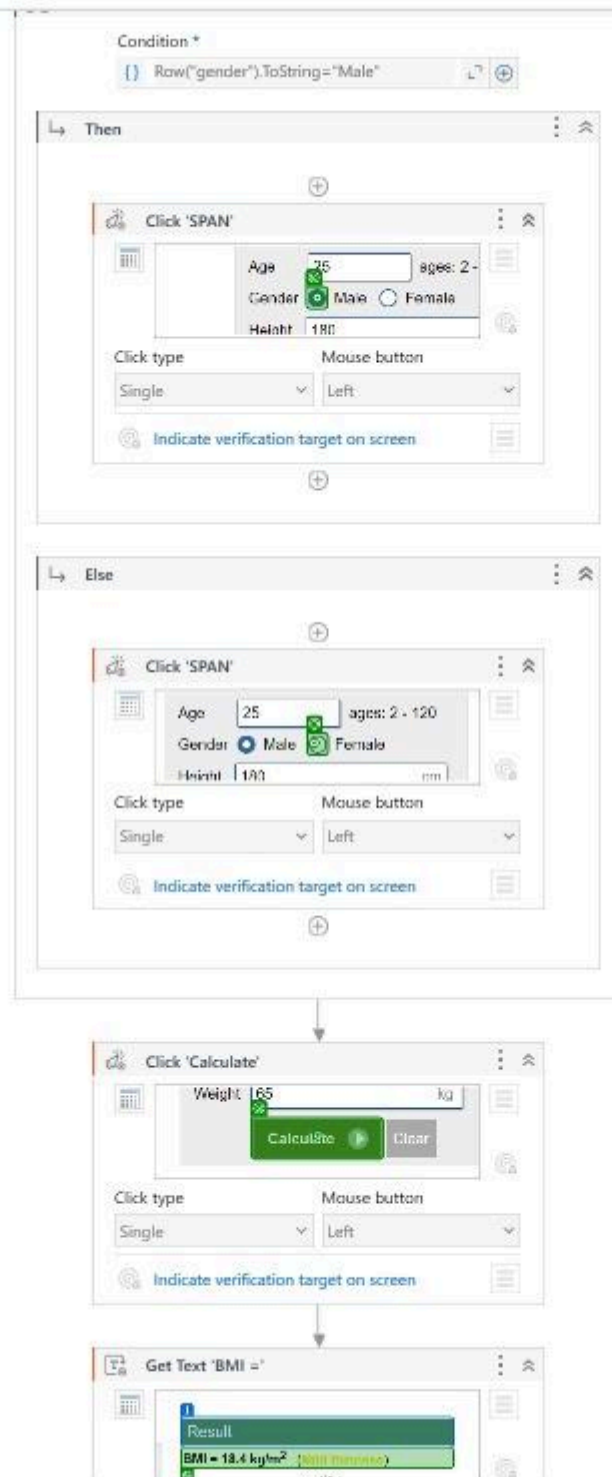
Despite its efficiency, the bot may face challenges in contexts requiring manual verification or handling inconsistent input data. Ongoing updates and integration with advanced tools will be crucial to ensure its relevance in dynamic healthcare environments. Nonetheless, the project lays a strong foundation for healthcare automation, contributing to efficiency and precision in patient data management. Its successful implementation marks a significant advancement in leveraging technology for better healthcare outcomes.

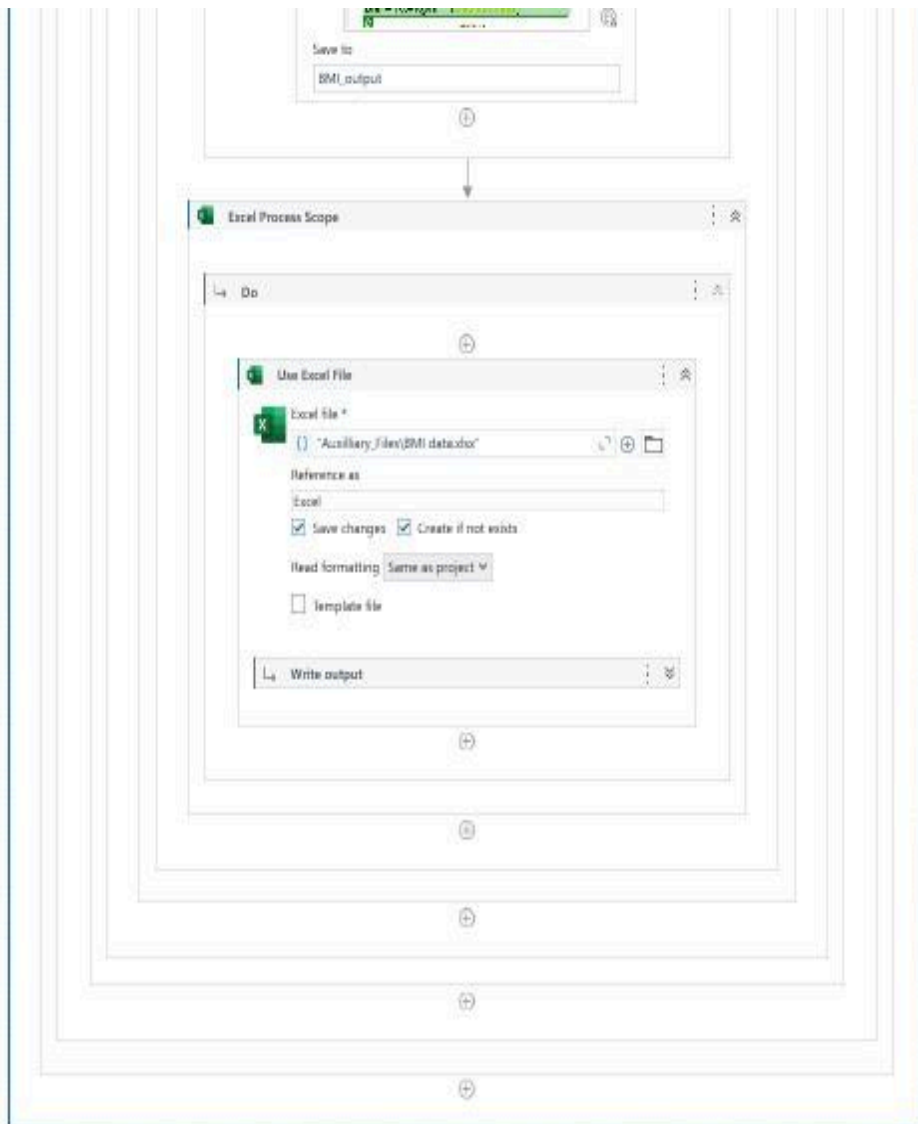
APPENDIX

PROCESS WORKFLOW









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