

LEAF SCARRING PROJECT

PRJ381 GROUP 4

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THE PROBLEM



WATER HYACINTH IS AN INVASIVE AQUATIC PLANT, WHICH POSES A SIGNIFICANT THREAT TO FRESHWATER ECOSYSTEMS BY RAPIDLY SPREADING AND DISRUPTING LOCAL BIODIVERSITY AS WELL AS WATER QUALITY.

ITS DENSE GROWTH CAN BLOCK WATER FLOW, IMPEDE FISHING ACTIVITIES, AND CONTRIBUTE TO OXYGEN DEPLETION, ENDANGERING AQUATIC LIFE. ANALYSING LEAF SCARRING IS ESSENTIAL FOR UNDERSTANDING THE PLANT'S GROWTH PATTERNS, DETECTING AREAS OF INFESTATION, AND EVALUATING THE EFFECTIVENESS OF MANAGEMENT EFFORTS.



THIS PROJECT FOCUSES ON DEVELOPING A RELIABLE, SCALABLE METHOD TO DETECT AND ANALYSE LEAF SCARRING USING ADVANCED TECHNOLOGIES, PROVIDING A VALUABLE TOOL FOR ENVIRONMENTAL MONITORING, RESOURCE ALLOCATION, AND LONG-TERM CONSERVATION STRATEGIES.

THE PROPOSED SOLUTION IS A DIGITAL SYSTEM THAT LEVERAGES IMAGE PROCESSING AND MACHINE LEARNING TO ACCURATELY DETECT AND ANALYZE LEAF SCARRING ON WATER HYACINTH PLANTS. BY USING ADVANCED ALGORITHMS, THE SYSTEM CAN IDENTIFY, QUANTIFY, AND TRACK SCARRING PATTERNS OVER TIME, OFFERING A SCALABLE AND EFFICIENT WAY TO MONITOR WATER HYACINTH INFESTATIONS.

SOLUTION OVERVIEW

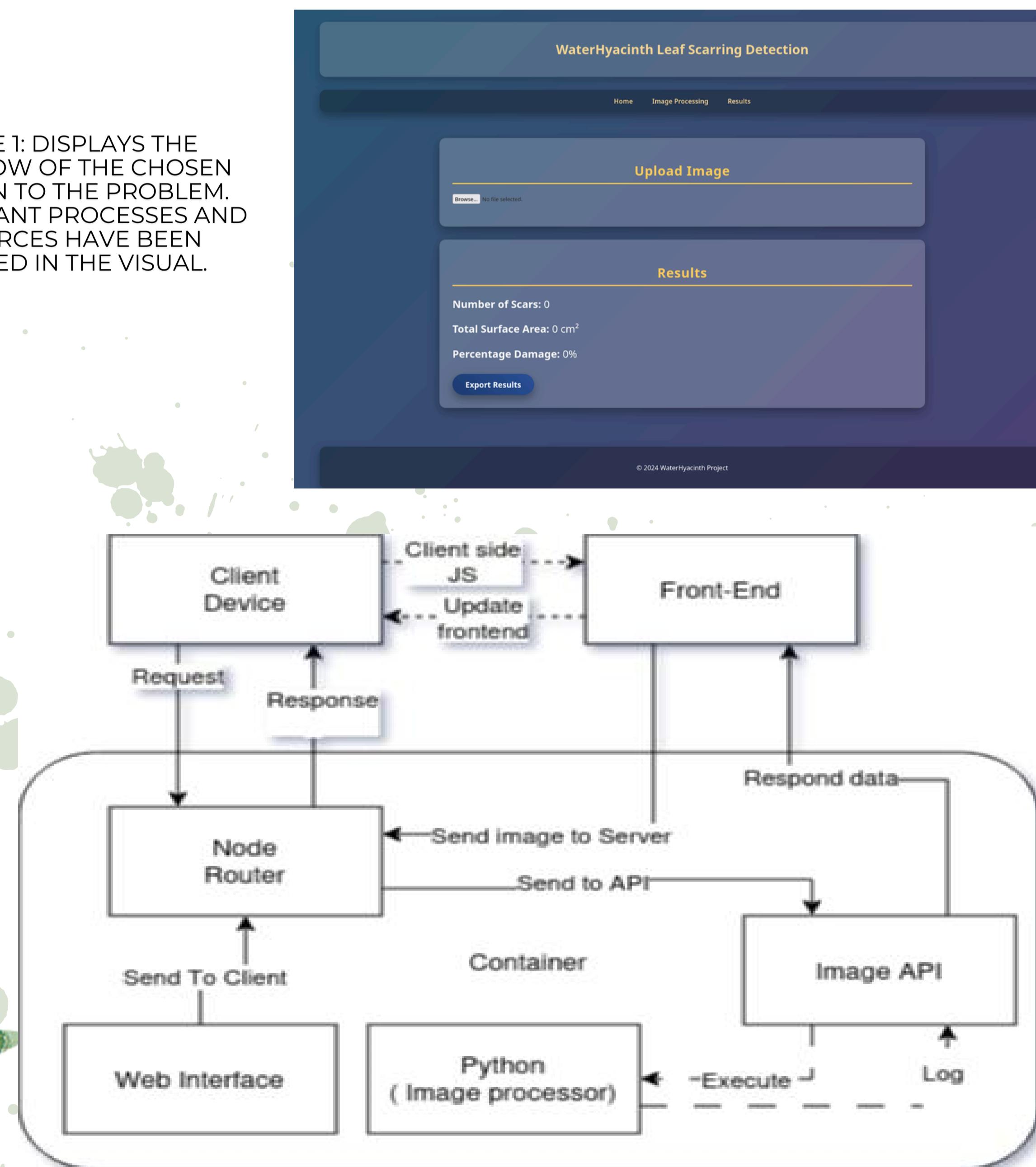


KEY FEATURES INCLUDE REAL-TIME DATA ANALYSIS, A USER-FRIENDLY INTERFACE FOR FIELD USE, AND AUTOMATED REPORTING TOOLS TO SUPPORT ENVIRONMENTAL MANAGEMENT AND CONSERVATION EFFORTS. THIS INNOVATIVE APPROACH ENABLES PROACTIVE MONITORING, HELPING MITIGATE THE IMPACT OF WATER HYACINTH ON AQUATIC ECOSYSTEMS.

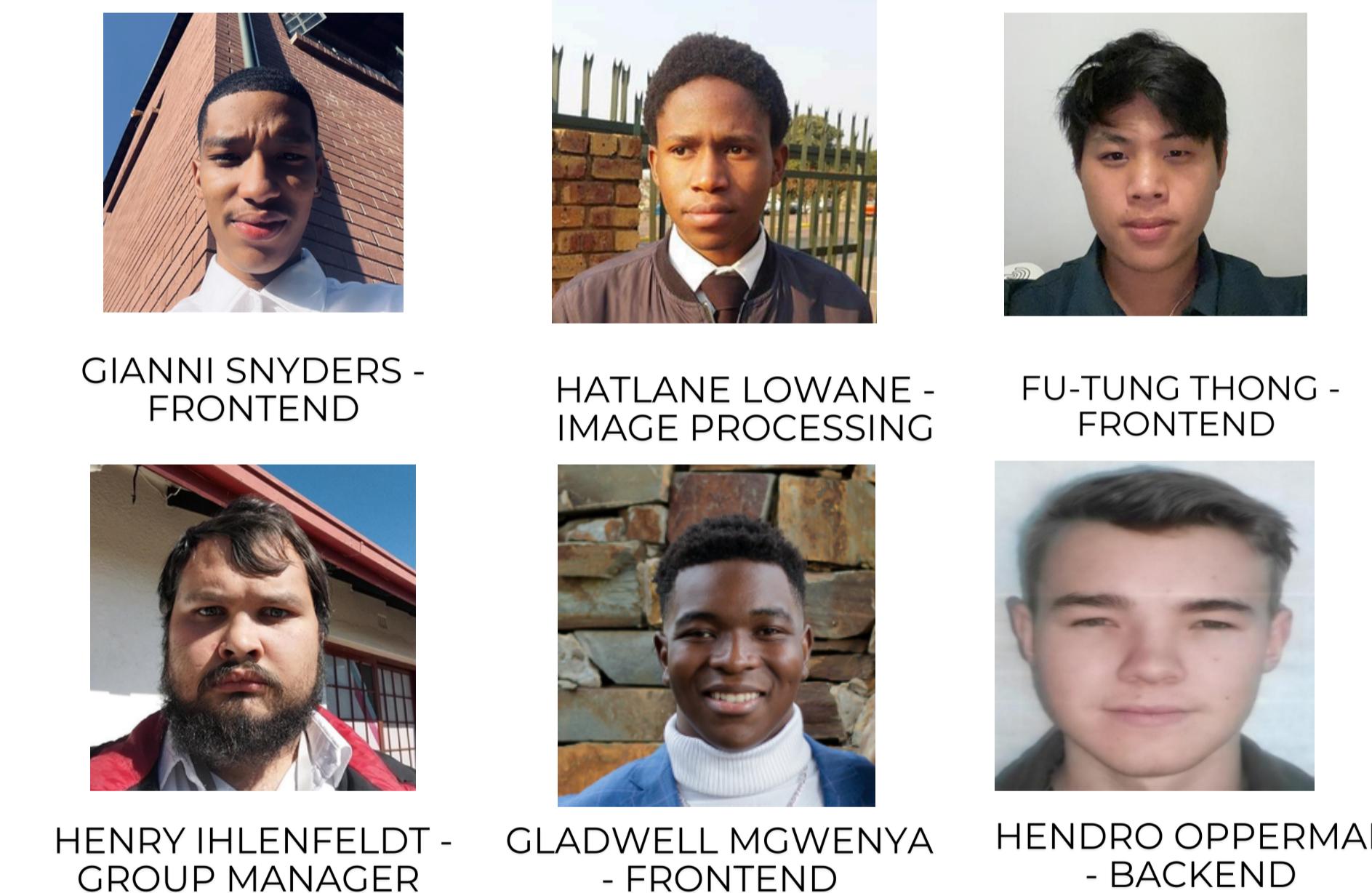
BY ANALYZING SCARRING DATA, THE SYSTEM CAN HELP PREDICT INFESTATION TRENDS AND ASSIST IN PRIORITIZING AREAS FOR INTERVENTION. THE USE OF MACHINE LEARNING ALLOWS THE SYSTEM TO ADAPT AND IMPROVE ACCURACY OVER TIME, EVEN WITH NEW ENVIRONMENTAL DATA. ITS MODULAR DESIGN ENSURES THAT IT CAN BE EXPANDED OR CUSTOMIZED FOR DIFFERENT REGIONS AND SPECIFIC ECOLOGICAL NEEDS. BY FOCUSING ON BOTH ACCURACY AND EASE OF USE, THE SOLUTION IS DESIGNED TO BE ACCESSIBLE TO A WIDE RANGE OF USERS, FROM RESEARCHERS TO FIELD WORKERS.

SOFTWARE IN ACTION

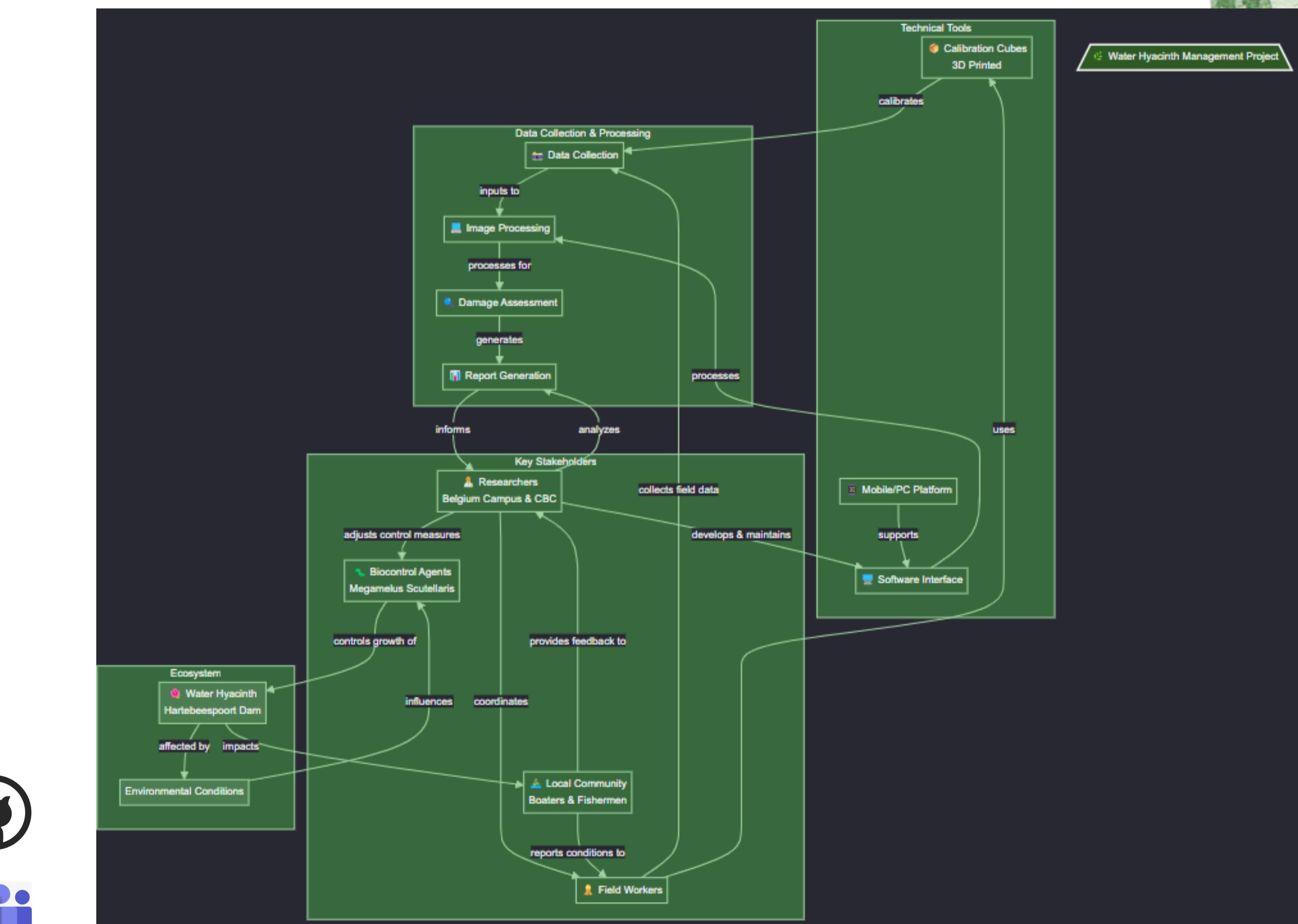
FIGURE 1: DISPLAYS THE WORKFLOW OF THE CHOSEN SOLUTION TO THE PROBLEM. ALL RELEVANT PROCESSES AND RESOURCES HAVE BEEN INCLUDED IN THE VISUAL.



TEAM 69



OUR STORY: WE TACKLED THIS PROJECT WITH A SHARED PASSION FOR REDUCING THE ENVIRONMENTAL IMPACT POSED BY INVASIVE SPECIES, LIKE WATER HYACINTH. USING GITHUB AS OUR CENTRAL COLLABORATION PLATFORM, WE EFFICIENTLY SHARED PROJECT FILES, TRACKED PROGRESS, AND MAINTAINED VERSION CONTROL. REGULAR COMMUNICATION VIA TEAMS ENSURED SEAMLESS COORDINATION, ALLOWING US TO BRAINSTORM IDEAS, SOLVE PROBLEMS COLLABORATIVELY, AND STAY ALIGNED WITH OUR GOALS. THROUGH PLANNING AND EFFORT DURING IMPLEMENTATION, WE DEVELOPED A SOLUTION FOR DETECTING AND ANALYZING LEAF SCARRING.



RICH PICTURE