Revisions and Responses for the Reviewers’ Comments

Paper ID: TAFE-10-0063-2023

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| **Review Comment** | **Response** |

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| This paper presents an innovative approach for fruit monitoring and management using RFID technology. By replacing manual paper-based processes with a cloud-based system, it addresses important issues in the fruit industry, such as timing errors in agro-chemical spraying and inefficient worker deployment. Below are my comments for the author | Your review of this manuscript is highly appreciated |

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| 1.1 Including details about the estimated working range would be a valuable addition. | practical RFID (13.56MHz) working range: is 5cm  This information has been Included in sec 3A |

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| 1.2 Please review the paper for typos, such as "Freetos," which should be corrected to "FreeRTOS." | Thank you. The revised paper has been checked for typos and grammatical errors. Corrections have been made. |
| 1.3 The maximum working range of the RFID reader is not mentioned. | Please refer to 1.1 above. Required information has been included in the revised manuscript. |
| 1.4 Page 2 line 1: The figures citation is missing "fruits remain inside these bags as shown in Fig.??." | This has been corrected. |

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| 1.5 In the proposed system, a dedicated hardware module has been created for tag reading, serving as a cost-effective RFID reader solution. However, there is no explicit comparison of the hardware's cost within the provided information. | The component cost per field device is just $25, and with other indirect costs, it would be $50-$75. And, only about 25 units are required even for a large orchard with about 50,000 trees and some 1000,000 mangos every season because workers are deployed in teams of about 10.  Revised the paper including the details in section 1V Pilot Project – first paragraph, and also in section V Conclusion-second paragraph |
| 1.6 The mobile application has been independently developed, but it raises the question of why the smartphone internal RFID reader haven't been utilized (instead of using a separate module)? Nowadays almost every smartphone have built-in RFID reader(13.56 MHz), by leveraging the mobile phone's built-in reader, the need for a separate hardware module could be eliminated. | * Agrochemical spraying while handling a smartphone requires both hands of the worker, which is very inconvenient. A wearable device, on the other hand, is more convenient. * Smartphones are not designed to withstand rough field conditions such as in a mango orchard where agrochemicals are used nearby. * Utilizing smartphones is associated with the risk of leaking confidential data out of the company. * The workers generally don't have modern smartphones with RFID reading. And, it's not cost-effective for the grower to provide modern smartphones while the hand-wearable device costs only $25.   The paper was revised including the above details in Section IIIA (end of page 2) |
| 1.7 The working range of the deployed mesh network, i.e., the maximum distance between individual nodes, has not been evaluated. | * The maximum range between 2 nodes is 15m-20m, depending on the environmental factors. * Due to low power consumption, implementation feasibility, and low cost, the 15-20m range ESPNow was chosen as the most appropriate mesh network technology for this application. The ESP module has required hardware built-in to support ESPNow protocol. The 15-20m range of ESPNow mesh network is quite adequate because the workers go to the field in small groups of about five, and they move together from tree to tree.   Revised the paper Including the above descriptions at the end of section IIIB (3rd page, end of the first column) |

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| **Reviewer 2** | **Response** |
| The paper “RFID Based Fruit Monitoring and Orchard Management System” written by Munasinghe et al. deals with an interesting and hot topic in RFID technology applications. I have some comments on the paper content, itemized in the following: | Your review of this manuscript is highly appreciated |

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| 2.1 The authors cite some relevant work already published on the same topic. However, they should explain in more detail why their solution is different and more functional/low-cost etc. compared to the others. | Ref [3] and [5]: Scalability and infrastructure cost are major challenges for commercial deployment.  Ref [6],[7], and[8] are not scalable for commercial deployment in a large orchard.  The proposed solution is scalable and highly cost-effective.  The paper has been revised including the above explanations on page 1 2nd column, and first paragraph. |
| 2.2 The authors use several common communication protocols for their management system, and the solution they adopt seems quite standardized and simply applied in one specific context. For this reason, the novelty of the proposed solution, from the technological point of view, is not completely clear and should be elaborated more. | This research addresses the unique problem of monitoring fruits (mango) and managing the orchard operations and the workforce. The solution proposed must be cost-effective and scalable for large orchards. And, it doesn't have to be necessarily applicable to many crops. Hence, the most effective solution was devised by integrating the existing technologies. The novel features of the proposed solution are as follows.   1. Cost-effective hand device improves worker deployment, task assignment, and worker efficiency. 2. Once a fruit is treated by a worker, all of the workers in the group get their information updated through the mesh network. This eliminates workers approaching an already treated fruit. 3. The status of the orchard is visualized indicating completed tasks, upcoming tasks, worker efficiency, yield, and losses.   The paper has been revised including the above justification in the section v Conclusion, second paragraph. |

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| 2.3 The authors claim that a small-scale pilot project was carried out to test the entire process, but the results of the testing are not reported or described. What is reported is the detailed functioning of the app and some examples of its use. | The details and the outcome of the small-scale pilot project have been clearly described in Section iV Pilot Project – second paragraph |
| 2.4 The text contains some grammar errors/typos, especially in the introduction, and should be checked by the authors. Some figures (Fig. 7 and Fig. 8) are too big. | Typos and grammar errors have been checked and corrected. |