Project Design Phase-II

Solution Requirements(Functional&Non-functional)

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| Date | 15October2022 |
| Team ID | PNT2022TMID19083 |
| Project Name | SMART WASTE MANAGEMENT SYSTEM IN METROPOLITAN CITIES |
| Maximum Marks | 4Marks |

Functional Requirements:

Following are the functional requirements of the proposed solution.

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| **FR No.** | **Functional Requirement(Epic)** | **Sub Requirement(Story/Sub-Task)** |
| FR-1 | Detailed bin inventory. | All monitored bins and stands can be seen on the map and you can visit them at any time via the Street View feature from Google.  You can see bin details in the Dashboard – capacity, waste type ,last measurement, GPS location. |
| FR-2 | Real time bin monitoring. | The Dashboard displays real-time data on fill-levels of bins monitored by smart sensors.  In addition to the %of fill-level, based on the historical data, the tool predicts when the bin will become full, one of the functionalities that are not included even in the best waste management software..  Sensorsrecognizepicksaswell;soyoucancheckwhenthebinwaslastcollected.  With real-time data and predictions, you can eliminate the overflowing bins and stop collecting half-empty  ones. |
| FR-3 | Expensive bins. | We help you identify bins that drive up your collectioncosts.Thetoolcalculatesaratingforeachbinintermsofcollectioncosts.  The tool considers the average distance depo-bin-discharge in the area. The tool assigns  (1-10)and calculates distance from depo -bin discharge. |
| FR-4 | Adjust bin distribution. | Ensure the most optimal distribution of bins  Make sure all trash types are represent within a stand.  Based on the historical data, you can adjust bin capacity  Or location where necessary. |
| FR-5 | Eliminate unefficient picks. | Eliminate the collection of half-empty bins. The sensors recognize picks.  By using real-time data on fill-levels and pick recognition, we can show you how full the bins you  collect are. |

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|  |  | The report shows how full the bin was when picked.Youimmediatelyseeanyinefficientpicksbelow80%  full. |
| FR-6 | Plan waste collection | The tool semi-automates waste collection route planning .Based on current bin fill-level sand predictions of reaching full capacity, you are ready to respond and schedule waste collection.  You can compare and  Identify any inconsistencies. |

Non-functional Requirements:

Following are the non-functional requirement so the proposed solution.

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| **FR No.** | **Non-Functional Requirement** | **Description** |
| NFR-1 | **Usability** | IoT device verifies that usability is a special and important perspective to analyze user requirements, which can further improve the design quality. In the design process with user experience as the core, the analysis of users’ product usability can indeed help designers better understand users’potential needs  In waste management ,behavior and experience. |
| NFR-2 | **Security** | Use are usable bottles Use reusable grocery bags  Purchase wisely and recycle  Avoid using containers. |
| NFR-3 | **Reliability** | Smart waste management is also about creating better working conditions for waste collectors and drivers. Instead of driving the same collection routes and servicing empty bins, spend their time more efficiently ,taking care of bins that  Need servicing. |
| NFR-4 | **Performance** | The Smart Sensors use ultrasound technology tomeasurethefilllevels(alongwithotherdata)inbinsseveraltimesaday.Using avarietyofIoTnetworks((NB-IoT,GPRS),the sensors send the data to  Sensoneo’s Smart Waste Management SoftwareSystem, apowerfulcloud-based platform, fordata-driven daily operations, available also as a waste management app.  Customers are hence provided data-driven decisionmaking,andoptimizationofwastecollectionroutes,frequencies,andvehicleloadsresulting in route  reductionbyatleast30%. |
| NFR-5 | **Availability** | By developing & deploying resilient hardware and beautiful software we empower cities, business,  And countries to manage waste smarter. |
| NFR-6 | **Scalability** | Using smart waste bins reduce the number of bins  Inside town, cities |

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