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Effective Data Management using Iterative Approach in Data Systems

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Abstract: *In our innovative approach to customer service for household appliance repair, we harness cutting-edge technology to provide efficient and effective solutions to our valued customers. This project not only addresses the repair of household appliances but also revolutionizes the customer service experience. Feature engineering comes into play, creating relevant features such as time since the last maintenance, cumulative operating hours, error logs, temperature readings, and vibration levels. This ensures a comprehensive dataset with features reflective of both the current state of the equipment and indicators of potential issues. The subsequent application of feature selection techniques involves a multi-faceted approach. Filter methods, including correlation coefficients and statistical tests such as chi-square, pinpoint features highly correlated with the target variable, optimizing the system's predictive capabilities.*

Keywords: Customer services, Effective data management, Free flow of the service

I. INTRODUCTION

The customer service for householdappliance repair is undergoing a revolutionary transformation, driven by the fusion of cutting-edge technology and unwavering dedication to customer-centric principles. Our proposed system represents a paradigm shift from traditional manual processes to a data-driven, transparent, and seamlessly integrated service model, enhanced by the integration of artificial intelligence (AI) in the selection of service personnel. By harnessing real-time data analytics, sophisticated feature selection algorithms, and AI-driven personnel selection, we not only diagnose appliance issues swiftly and accurately but also prioritize efficiency, transparency, and customer satisfaction at every stage of the service journey. Our commitment to continuous improvement drives us to set new industry benchmarks, anticipating future enhancements such as predictive maintenance models, virtual chat support, and expanded sustainability initiatives. With a global vision and a steadfast focus on innovation, our system is poised to redefine the standards of excellence in appliance repair service, ensuring that we remain at the forefront of meeting evolving customer needs.

II. LITERATURE SURVEY

Randomized Aggregable Privacy-Preserving Ordinal Response, or RAPPOR, is a technology for crowdsourcing statistics from end-user client software, anonymously, with strong privacy guarantees. In short, RAPPORs allow the forest of client data to be studied, without permitting the possibility of looking at individual trees. By applying randomized response in a novel manner, RAPPOR provides the mechanisms for such collection as well as for efficient, high-utility analysis of the collected data. In particular, RAPPOR permits statistics to be collected on the population of client-side strings with strong privacy guarantees for each client, and without link ability of their reports. This paper describes and motivates RAPPOR, details its differential-privacy and utility guarantees, discusses its practical deployment and properties in the face of different attack models, and, finally, gives results of its application to both synthetic and real-world data. Randomized Aggregable Privacy-Preserving Ordinal Response, or RAPPOR, is a technology for crowdsourcing statistics from end-user client software, anonymously, with strong

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Without proper privacy protection mechanisms, it either puts individual privacy in jeopardy or hampers business opportunities due to users’ unwillingness to share their true rankings. In this paper, we initiate the study of collecting preference rankings under local differential privacy. The key technical challenge comes from the fact that the number of possible rankings could be large in practical settings, leading to excessive injected noise. To solve this problem, we present a novel approach SAFARI, whose main idea is to collect a set of distributions over small domains which are carefully chosen based on the riffle independent (RI) model to approximate the overall distribution of users’ rankings, and then generate a synthetic ranking dataset from the obtained distributions. By working on small domains instead of a large domain, SAFARI can significantly reduce the magnitude of added noise. In SAFARI, we design two transformation rules, namely Rule I and Rule II, to instruct users to transform their data to provide the information about the distributions of the small domains. In particular, we propose a method called LADE to precisely estimate the required distributions used for the structure learning of RI model. We also propose a new LDP method called SAFA for frequency estimation over multiple attributes that have small domains. We formally prove that SAFARI guarantees <inline-formula><Tex-mathnotation="LaTeX">$\Var epsilon$</Tex-math><alternatives><mml: math><mml:mi>ɛ</mml:mi></mammate><inline-graphic link: href="cheng-ieq1-3186907.gif"/></alternatives></inline-formula>-local differential privacy. Extensive experiments on real datasets confirm the effectiveness of SAFARI. In this paper, we consider the problem of designing Differentially Private (DP) algorithms for Stochastic Convex Optimization (SCO) on heavy-tailed data. The irregularity of such data violates some key assumptions used in almost all existing DP-SCO and DP-ERM methods, resulting in failure to provide the DP guarantees. To better understand this type of challenges, we provide in this paper a comprehensive study of DP-SCO under various settings. First, we consider the case where the loss function is strongly convex and smooth. For this case, we propose a method based on the sample-and-aggregate framework, which has an excess population risk of $\tilde{O}(d^3/n\varepsilon^4)$ (after omitting other factors), where n is the sample size and d is the dimensionality of the data. Then, we show that with some additional assumptions on the loss functions, it is possible to reduce the expected excess population risk to $\tilde{O}(d^2/n\varepsilon^2)$. To lift these additional conditions, we also provide a gradient smoothing and trimming based scheme to achieve excess population risks of $\tilde{O}(d^2/n\varepsilon^2)$ and $\tilde{O}(d^{2/3}/(n\varepsilon^2)^{1/3})$ for strongly convex and general convex loss functions, respectively, with high probability. Experiments suggest that our algorithms can effectively deal with the challenges caused by data irregularity.We present an approach to differentially private computation in which one does not scale up the magnitude of noise for challenging queries, but rather scales down the contributions of challenging records. While scaling down all records uniformly is equivalent to scaling up the noise magnitude, we show that scaling records non-uniformly can result in substantially higher accuracy by bypassing the worst-case requirements of differential privacy for the noise magnitudes. This paper details the data analysis platform wiping, which generalizes the Privacy Integrated Query (PINQ) to weighted datasets. Using a few simple operators (including a non-uniformly scaling Join operator) wiping can reproduce (and improve) several recent results ongraph analysis and introduce new generalizations (*e.g.*, counting triangles with given degrees). We also show how to integrate probabilistic inference techniques to synthesize datasets respecting more complicated (and less easily interpreted) measurements. Over the past five years a new approach to privacy-preserving data analysis has borne fruit [13, 18, 7, 19, 5, 37, 35, 8, 32]. This approach differs from much (but not all!) of the related literature in the statistics, databases, theory, and cryptography communities, in that a formal and *ad omnia* privacy guarantee is defined, and the data analysis techniques presented are rigorously proved to satisfy the guarantee. The key privacy

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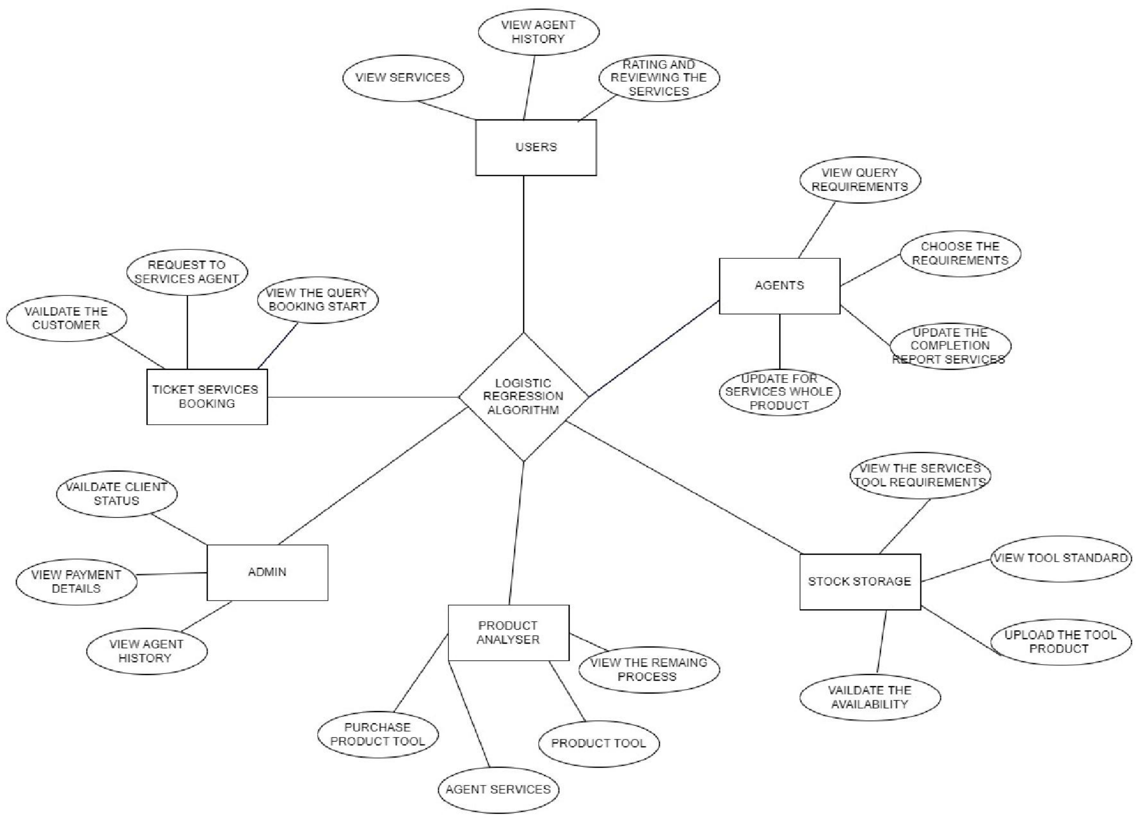
guarantee that has emerged is differential privacy. Roughly speaking, this ensures that (almost, and quantifiably) no risk is incurred by joining a statistical database.This paper describes a differentially private event-triggered sampling mechanism to select measurement samples from a data sequence whose dynamics can be modelled by a stochastic linear system. The mechanism produces subsequence's that can be used to estimate the original sequence relatively accurately and the differential privacy constraint guarantees that these sub sequences are insensitive to certain variations in the input sequence.

III. SYSTEM ARCHITECTURE



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IV. EXPERIMENTAL RESULT

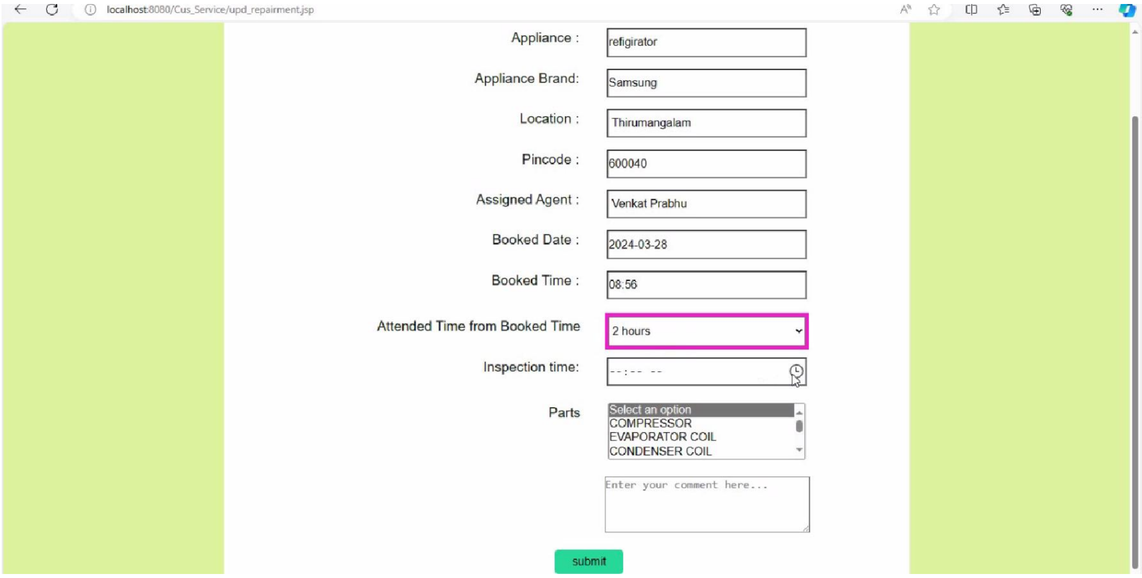

Fig 1. Customer Login

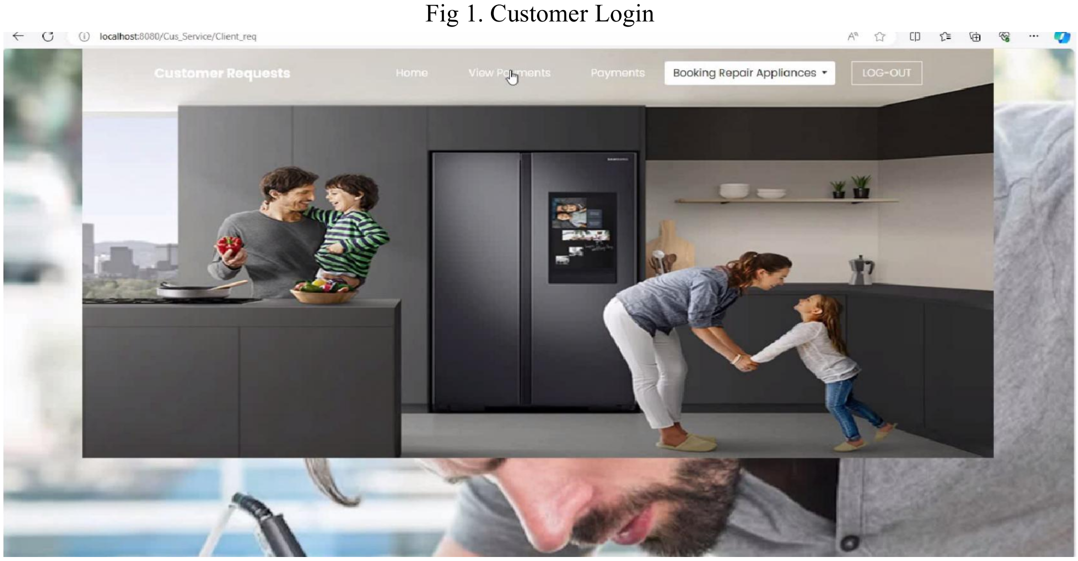

Fig2. Customer Booking

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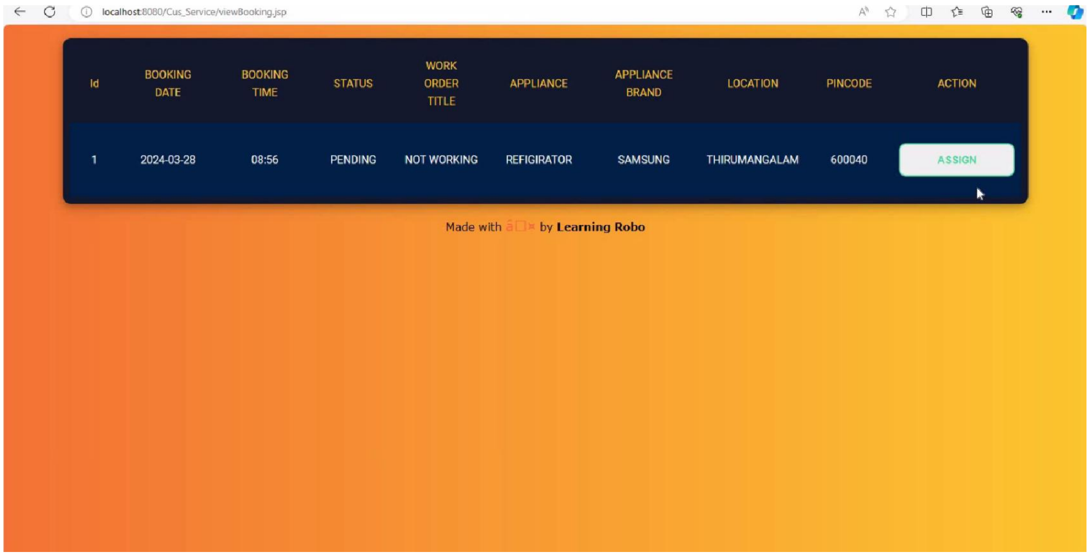

Fig3. Agent Assigning

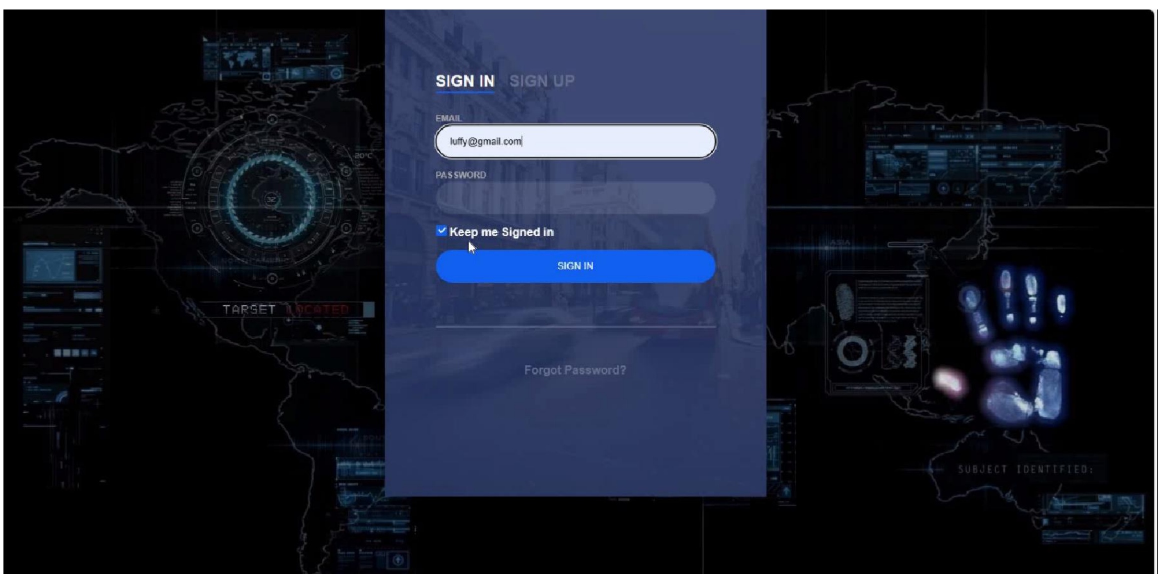

Fig 4. Stock Login

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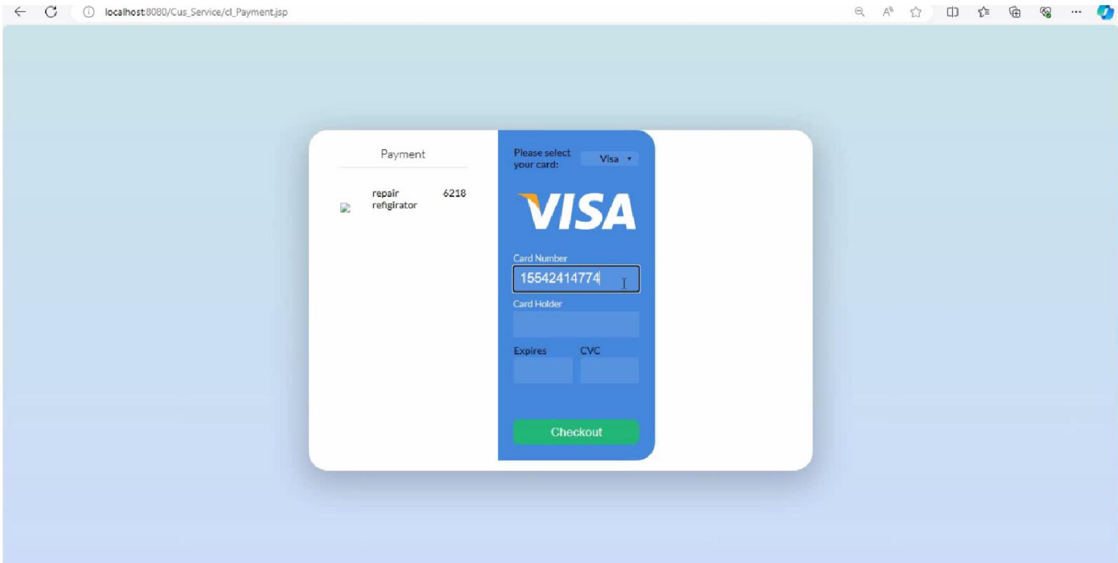

Fig 5. Customer Securing Payment

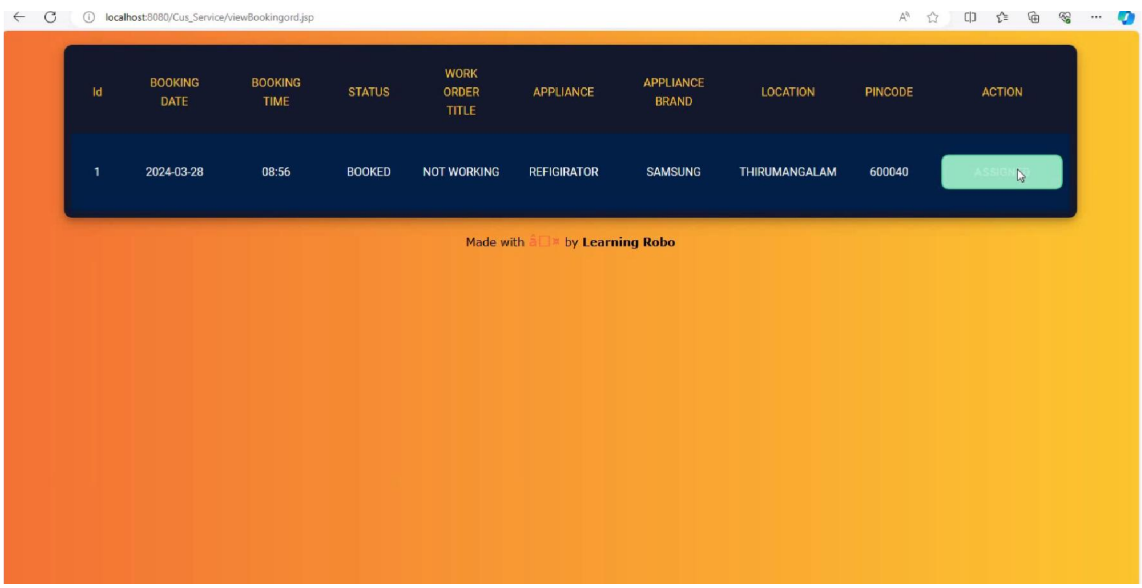

Fig6. Agent Assigned

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1	MOTOR	DISHWASHER	THE MOTOR MAY NEED TO BE REPLACED IF IT IS NOT WORKING PROPERLY. THIS CAN BE A COMPLEX REPAIR, SO IT IS BEST TO HAVE IT DONE BY A QUALIFIED TECHNICIAN.	THE HEART OF THE DISHWASHER. IT IS RESPONSIBLE FOR TURNING THE IMPELLER AND AGITATING THE WATER.	100	1.23E+11
2	HEATING ELEMENT	DISHWASHER	THE HEATING ELEMENT MAY NEED TO BE REPLACED IF IT IS NOT WORKING PROPERLY. THIS IS A RELATIVELY SIMPLE REPAIR THAT CAN BE DONE BY MOST HOMEOWNERS.	RESPONSIBLE FOR HEATING THE WATER IN THE DISHWASHER. THIS IS NECESSARY FOR THE WASHING CYCLE TO WORK PROPERLY.	66	9.88E+11
3	TIMER	DISHWASHER	THE TIMER MAY NEED TO BE REPLACED IF IT IS NOT WORKING PROPERLY. THIS IS A RELATIVELY SIMPLE REPAIR THAT CAN BE DONE BY MOST HOMEOWNERS.	CONTROLS THE WASHING CYCLE. IT DETERMINES HOW LONG THE DISHWASHER WILL RUN FOR EACH CYCLE.	105	98765432109
4	DRAIN PUMP	DISHWASHER	THE DRAIN PUMP MAY NEED TO BE REPLACED IF IT IS NOT WORKING PROPERLY. THIS IS A RELATIVELY SIMPLE REPAIR THAT CAN BE DONE BY MOST HOMEOWNERS.	REMOVES THE WATER FROM THE DISHWASHER AFTER THE CYCLE IS COMPLETE.	189	8.77E+11
5	DOOR SWITCH	DISHWASHER	THE DOOR SWITCH MAY NEED TO BE REPLACED IF IT IS NOT WORKING PROPERLY. THIS IS A RELATIVELY SIMPLE REPAIR THAT CAN BE DONE BY MOST HOMEOWNERS.	PREVENTS THE DISHWASHER FROM STARTING IF THE DOOR IS OPEN.	185	4.99E+11

Fig 7. Product Stock Availability

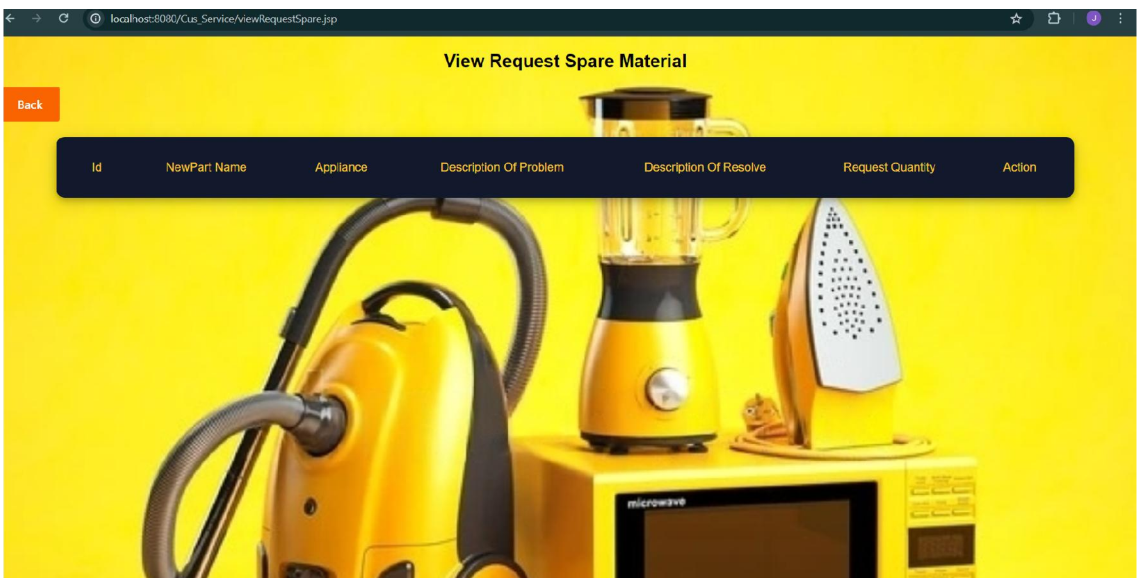

Fig 8. Requesting Spare Material

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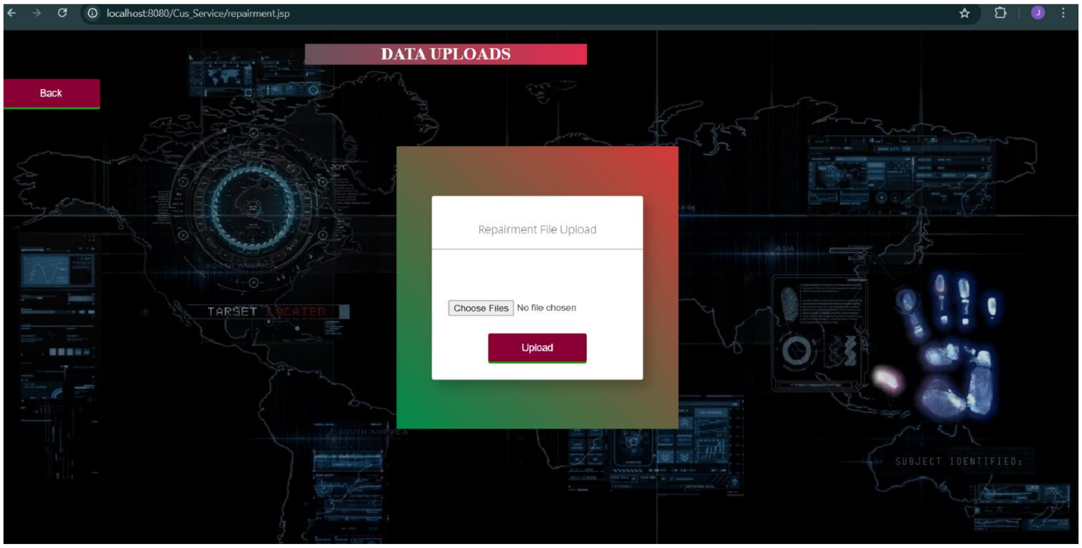

Fig 9. Uploading Repairment File

V. CONCLUSION

In conclusion, the proposed system for customer service in household appliance repair represents a significant advancement in the industry. By integrating cutting-edge technology, data-driven decision-making, and a customer-centric approach, it aims to revolutionize the service landscape. Key advantages include customer-centric excellence, transparency in repair costs, and seamless data integration. Furthermore, future enhancements such as predictive maintenance models and sustainability initiatives demonstrate a commitment to ongoing innovation. Ultimately, the system sets a new benchmark for service excellence, prioritizing customer satisfaction and efficiency in appliance repair.

REFERENCES

[1] U. Erlingsson, V. Pohar, and A. Koroleva, “RAPPOR: Randomizedaggregable privacypreserving ordinal response,” in Proc. ACMSIGSAC Conf. Compute. Commune. Secure., 2014, pp. 1054–1067.

[2] J. Tang, A. Koroleva, X. Bai, X. Wang, and X. Wang, “Privacy loss inapple’simplementation of differential privacy on macOS 10.12,” Corri, vol. abs/1709.02753, 2017.

[3]C. Dwork, F. McSherry, K. Nissim, and A. D. Smith, “Calibratingnoise to sensitivity in private data analysis,” in Proc. Theory CryptogramConf., 2006, pp. 265–284.

[4]“Safari,” 2022. [Online]. Available: https://github.com/wyfs4321/SAFARI “Sushi data,”2016. [Online]. Available: http://www.kamishima.net/sushi

[5]“Jester data,” 2001. [Online]. Available: http://www.ieor.berkeley.edu/Goldberg/jester-data

[6]A. B. Tsygankov, Introduction to Nonparametric Estimation. Berlin, Germany: Springer,2009.

[7]“Source code of safari,” 2021. [Online]. Available: https://github.com/Cheng-lab-atbunt/SAFARI.