RECYCLING USED OLD THINGS

A PROJECT REPORT

Submitted by

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in partial fulfillment of requirements for the award of the course

AGB1211 – DESIGN THINKING

in

ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

K. RAMAKRISHNAN COLLEGE OF TECHNOLOGY

(An Autonomous Institution, affiliated to Anna University Chennai and Approved by AICTE, New Delhi)

SAMAYAPURAM – 621 112

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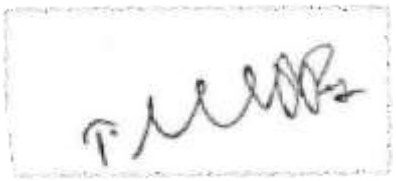
K. RAMAKRISHNAN COLLEGE OF TECHNOLOGY (AUTONOMOUS)

SAMAYAPURAM – 621 112

BONAFIDE CERTIFICATE

Certified that this project report on **"RECYLCING USED OLD THINGS"** is bonafide work of **(MOHAMED KYUF.R-23038117148211016, MOHAMEDRAFI.M-2303811714821017MOHAMMED ARIFF.N-2303811714821018, MOHEMMED SAJID.S-2303811714821019)** who carried out the project work during the academic year 2024 - 2025 under my supervision.



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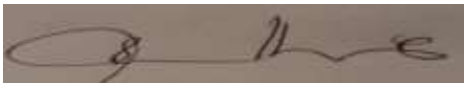

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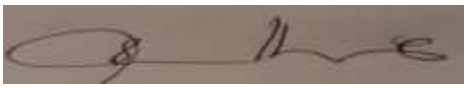
Submitted for the viva-voce examination held on 5.12.24



INTERNAL EXAMINER

EXTERNAL EXAMINER

DECLARATION

I declare that the project report on "**RECYCLING USED OLD THINGS"** is the result of original work done by us and best of our knowledge, similar work has not been submitted to "**ANNA UNIVERSITY CHENNAI**" for the requirement of Degree of **BACHELOR OF TECHNOLOGY**. This project report is submitted on the partial fulfillment of the requirement of the award of the **AGB1211 – DESIGN THINKING.**

Signature

MOHAMED KYUF.R

MOHAMED RAFI.M

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MOHEMMED SAJID.S

Place: Samayapuram

Date: 5/12/2024

ACKNOWLEDGEMENT

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I render our sincere thanks to the Course Coordinator and other staff members for providing valuable information during the course.

I wish to express our special thanks to the officials and Lab Technicians of our departments who rendered their help during the period of the work progress.

VISION OF THE INSTITUTION

To serve the society by offering top-notch technical education on par with global standards.

MISSION OF THE INSTITUTION

- Be a center of excellence for technical education in emerging technologies by exceeding the needs of industry and society.
- Be an institute with world class research facilities.
- Be an institute nurturing talent and enhancing competency of students to transform them as all- round personalities respecting moral and ethical values.

VISION AND MISSION OF THE DEPARTMENT

To become a renowned hub for AIML technologies to producing highly talented globally recognizable technocrats to meet industrial needs and societal expectation.

Mission 1: To impart advanced education in AI and Machine Learning, built upon a foundation in Computer Science and Engineering.

Mission 2: To foster experiential learning equips students with engineering skills to tackle real-world problems.

Mission 3: To promote collaborative innovation in AI, machine learning, and related research and development with industries.

Mission 4: To provide an enjoyable environment for pursuing excellence while upholding strong personal and professional values and ethics.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO 1: Excel in technical abilities to build intelligent systems in the fields of AI & ML in order to find new opportunities.

PEO 2: Embrace new technology to solve real-world problems, whether alone or as a team, while prioritizing ethics and societal benefits.

PEO 3: Accept lifelong learning to expand future opportunities in research and product development.

PROGRAM OUTCOMES

Engineering students will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO 1: Expertise in tailoring ML algorithms and models to excel in designated applications and fields.

PSO 2: Ability to conduct research, contributing to machine learning advancements and innovations that tackle emerging societal challenges.

ABSTRACT

Recycling used and old materials is a pivotal strategy for fostering environmental sustainability, reducing waste, and conserving natural resources. This practice involves repurposing or transforming discarded items into usable products, thereby minimizing landfill contributions and the depletion of raw materials. Recycling extends beyond conventional materials like paper, plastic, and metal to include creative reuse of household goods, furniture, and textiles, promoting a circular economy. By encouraging responsible consumption and innovative recycling techniques, individuals and communities can reduce their carbon footprint, save energy, and contribute to a healthier planet. This abstract highlights the importance of adopting recycling practices for a sustainable future and examines the role of education, innovation, and policymaking in driving this global initiative. This abstract underscores the importance of public awareness, government policies, and sustainable business practices in promoting effective recycling systems. Through collective action, recycling old and used things can transform waste management into a cornerstone of environmental resilience, fostering a cleaner and greener future for generations to come.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Recycling used and old items is a powerful step toward reducing waste, conserving resources, and protecting the environment. It involves transforming discarded materials and objects into new, useful products, significantly minimizing the strain on natural resources. This process helps reduce the volume of waste sent to landfills and incinerators, lowers pollution levels, and mitigates the adverse impacts of resource extraction.In today's world, where consumerism drives rapid resource depletion, recycling plays a pivotal role in fostering a circular economy—an approach where materials are continuously reused to create a closed-loop system. Beyond traditional recycling methods, creative approaches like upcycling and repurposing everyday items such as furniture, clothes, and electronics have gained prominence. These practices not only prevent waste but also inspire innovation and economic growth.

1.2 PROBLEM STATEMENT

The rapid pace of urbanization and industrialization has led to an exponential increase in waste generation worldwide, posing significant environmental and societal challenges. Landfills are overflowing, natural resources are being depleted at unsustainable rates, and waste management systems struggle to keep up with the growing volume of discarded materials. Moreover, improper disposal of items like electronics, plastics, and textiles exacerbates pollution, contributes to greenhouse gas emissions, and threatens biodiversity. Despite the availability of recycling methods, many old and used items, such as furniture, appliances, and clothing, end up in landfills due to a lack of awareness, infrastructure, or incentives for recycling and repurposing. Addressing these issues requires a systemic approach that encourages recycling, promotes innovative reuse.

1.3 OBJECTIVE

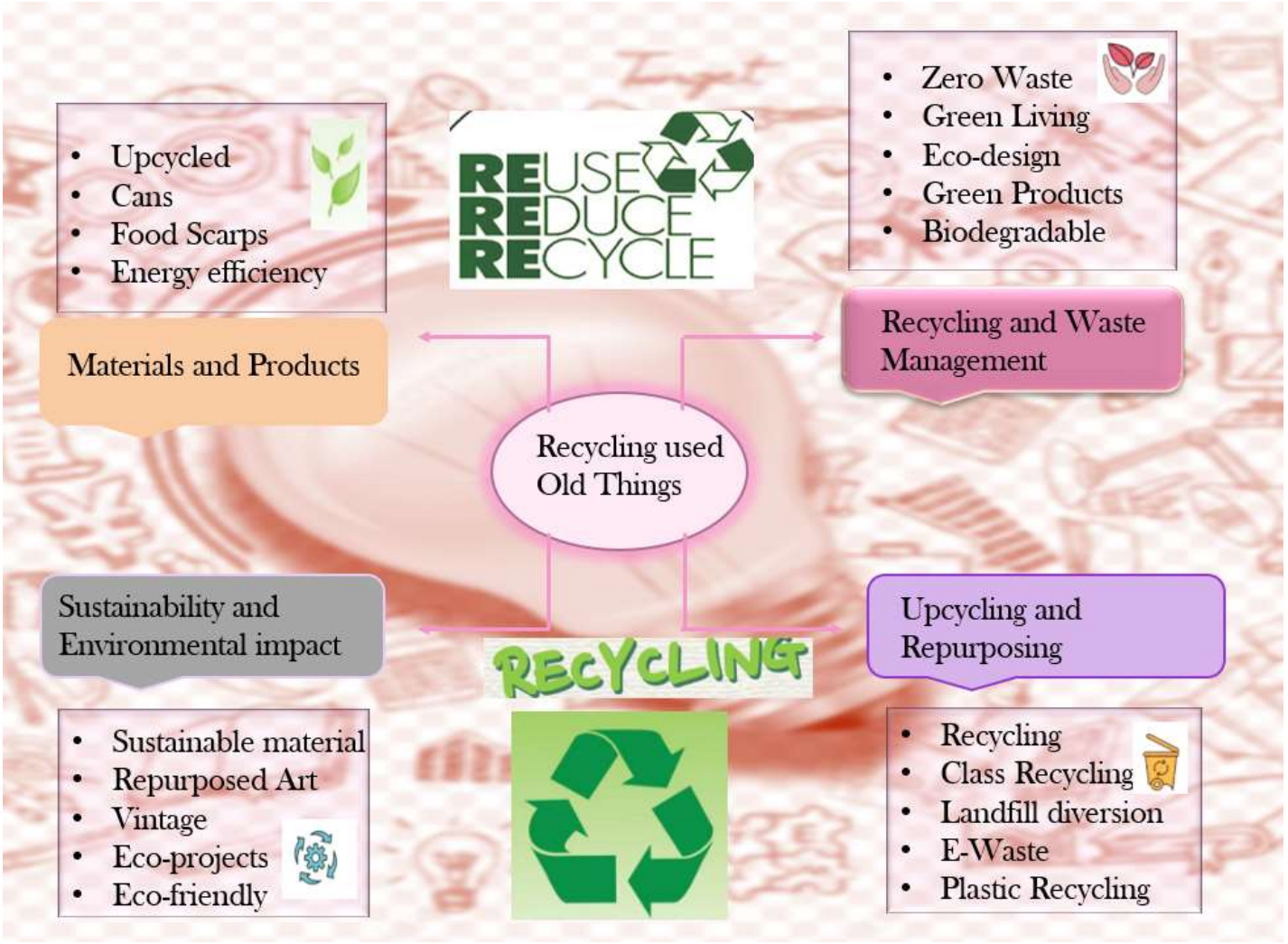
The primary objective of recycling used and old things is to reduce waste, conserve natural resources, and minimize the environmental impact of discarded materials. By transforming waste into reusable products, recycling aims to decrease landfill dependency, lower greenhouse gas emissions, and support the principles of a circular economy. Additionally, it seeks to promote sustainable consumption habits, encourage innovative reuse practices such as upcycling, and foster economic opportunities through the creation of green jobs. This initiative also aspires to raise public awareness about the importance of responsible waste management, engage stakeholders in building effective recycling systems, and contribute to a cleaner, healthier, and more sustainable planet for future generations.

The objective of recycling used and old things is to create a sustainable approach to waste management by reducing the volume of waste sent to landfills, conserving natural resources, and mitigating environmental pollution. It aims to transform discarded materials into reusable or repurposed products, thus supporting the principles of a circular economy where resources are continually reused and regenerated. This includes promoting eco-friendly consumption patterns, encouraging creative and innovative recycling practices like upcycling, and fostering economic opportunities through the development of green industries and jobs. Additionally, recycling seeks to increase public awareness about the importance of environmental responsibility, build efficient recycling infrastructures, and engage communities, industries, and policymakers in collaborative efforts to address global challenges such as resource depletion,

CHAPTER 2

PROJECT METHODOLOGY

2.1 BLOCK DIAGRAM



CHAPTER 3

KEY PHASES OF DESIGN THINKING

EMPATHIZE:

Recycling used and old things is more than a process—it is a reflection of our shared responsibility toward the planet and future generations. As the world grapples with mounting waste, depleting resources, and environmental degradation, the need to recycle goes beyond practicality; it is an act of empathy toward nature and humanity. By recycling, we acknowledge the intrinsic value of materials, reduce the strain on ecosystems, and mitigate the harm caused by excessive waste. It fosters a sense of connection, inspiring individuals to rethink consumption patterns and prioritize sustainability. Empathy in recycling also extends to communities, as it creates opportunities for equitable growth, economic empowerment, and collaboration. Ultimately, it is a commitment to nurturing a world where resources are cherished, waste is minimized, and the well-being of all living beings is safeguarded.

DEFINE:

Recycling used and old things refers to the process of collecting, reprocessing, and repurposing discarded materials or objects to create new products or extend their usability. This practice involves transforming waste—ranging from household items like paper, plastic, glass, and textiles to more complex materials such as electronics and metals—into valuable resources, thereby reducing landfill waste and conserving natural resources. Beyond traditional recycling, it also includes creative methods like upcycling, where items are given new life in innovative and functional ways. Recycling not only helps minimize environmental pollution but also promotes sustainable consumption, reduces energy usage in production processes, and supports the principles of a circular economy, ensuring that materials are reused efficiently and responsibly.

IDEATE:

Recycling used and old things offers immense potential for creativity and sustainability. To innovate in this space, ideas like community recycling hubs can serve as local centers for dropping off items, hosting workshops, and fostering creative upcycling. Digital platforms can enable people to share or trade unwanted items, while smart recycling bins equipped with AI can simplify waste sorting. Incentive programs, such as earning rewards for recycling, can motivate participation. Specialized labs for repurposing e-waste or transforming old furniture and textiles into functional or artistic products can reduce waste streams. Additionally, collaborations with designers to create sustainable fashion from old clothes and corporate partnerships to develop recyclable product designs can support the circular economy. Awareness campaigns using engaging content and interactive activities can further instill the importance of recycling, encouraging individuals and industries to adopt sustainable practices. These initiatives collectively aim to make recycling an integral part of life, contributing to a healthier planet.

PROTOTYPE:

The developed prototype is an innovative solution designed to streamline waste management and promote eco-friendly habits. It features a user-friendly interface that allows users to customize their experience by changing their usernames and setting personalized alerts to remind them to dispose of waste on time. Additionally, it includes interactive checkboxes to track and manage disposal activities effectively, ensuring that users stay on top of their waste disposal responsibilities. The prototype also provides access to valuable general information on proper waste disposal techniques and waste management practices, educating users on sustainable methods to minimize environmental impact. By combining reminders, educational content, and personalized features, this prototype empowers individuals to adopt responsible waste disposal habits and contribute to a cleaner, healthier environment

TESTING:

Testing this prototype involves evaluating its functionality, user experience, and overall effectiveness in promoting responsible waste management. The prototype should be tested to ensure that the username change feature works seamlessly, allowing users to personalize their accounts without any issues. Alerts for waste disposal should be checked for timely notifications and user customization options, making sure they are reliable and engaging. The checkboxes should be tested to confirm that they accurately track and remind users of their waste disposal tasks, enhancing user interaction and adherence to routines. Additionally, the educational content should be assessed for clarity, relevance, and ease of access, ensuring that users can quickly learn about proper waste disposal and management practices. Overall, thorough testing should focus on user satisfaction, interface usability, and the prototype's ability to support and motivate users to maintain eco-friendly waste habits.

Further testing of the prototype should include a range of user scenarios to identify potential improvements and ensure robustness across different use cases. This would involve engaging users from varied backgrounds and tech proficiency levels to gather feedback on the ease of navigation, responsiveness of alerts, and the intuitiveness of setting up reminders. The accuracy and consistency of waste disposal notifications should be monitored over time to confirm that they function reliably in different environments, such as varying network conditions. Additionally, the checkboxes used for task tracking should be tested for accuracy in marking completed tasks, syncing with other reminders, and ensuring that users receive prompt follow-up notifications. he general information section should be reviewed to confirm that the content is up-to-date, comprehensive, and understandable, presenting best practices in waste management in an engaging format. Performance testing should also be conducted to assess the system's ability to handle a large number of users simultaneously without slowing down. Lastly, user feedback collected during testing should be used to refine the prototype, making it more user-centric and effective in promoting better waste management habits.

CHAPTER 4

MODULE DESCRIPTION

3.1 Module 1: Recycling and Sustainability

This module introduces the fundamental concepts of recycling and its importance for environmental sustainability. It covers the impact of waste accumulation on ecosystems and the necessity for sustainable practices to preserve natural resources. The module explains the principles of sustainability and the circular economy, highlighting how recycling used and old items contributes to reducing landfill waste and conserving materials. The key benefits of recycling are outlined to illustrate its relevance in creating a cleaner, greener world.

3.2 Module 2: Recyclable Materials and Techniques

This module delves into the different types of materials that can be recycled, including paper, plastics, metals, glass, and textiles. It explores the various recycling techniques, such as mechanical, chemical, and biological methods, and distinguishes between traditional recycling and innovative approaches like upcycling. Emphasis is placed on e-waste recycling and how old electronics can be repurposed to minimize harmful environmental impacts.

3.3 Module 3: Designing and Implementing Recycling Systems

Focused on practical applications, this module explains the steps involved in setting up effective community recycling programs. It discusses the importance of waste segregation at the source and the role of innovative technology, such as automation and artificial intelligence, in enhancing recycling efficiency. Case studies from successful recycling initiatives around the world are presented to demonstrate how these systems can be adapted and implemented effectively.

3.4 Module 4: Creative and Practical Upcycling Projects

This module highlights various ways to repurpose and transform old items into new, functional, or decorative products. It encourages creative thinking by providing practical examples, such as turning old furniture into unique pieces or using textiles to make sustainable fashion items. The module also introduces tools and resources needed for small-scale upcycling projects and suggests ways to support local communities and small businesses through upcycling.

3.5 Module 5: Challenges, Policies, and Future Prospects

The final module explores the challenges that hinder effective recycling, including logistical, economic, and societal barriers. It covers the role of government policies and regulations in promoting recycling and waste management initiatives. Global trends in recycling practices and emerging technologies are examined, along with strategies for building public awareness and fostering collective action. The module concludes with a vision for a zero-waste future, highlighting the importance of education, innovation, and collaboration in achieving sustainable waste management goals.

CHAPTER 5
CONCLUSION

Recycling used and old things is essential for building a sustainable future and addressing the growing environmental challenges we face today. By repurposing materials and incorporating innovative recycling practices, we can reduce waste, conserve resources, and minimize pollution. Implementing effective recycling systems, promoting creative upcycling projects, and fostering public awareness are key steps in encouraging responsible consumption and waste management. While challenges remain, such as logistical hurdles and economic barriers, continued advancements in technology and supportive policies can pave the way for more efficient and widespread recycling practices. Ultimately, the adoption of recycling as a common practice can contribute to a circular economy, reduce our carbon footprint, and ensure a healthier environment for future generations. Through education, collaboration, and innovation, we can transform waste management from a problem into an opportunity for sustainable development and economic growth. As we advance, continued support for recycling initiatives and increased public engagement will be crucial in overcoming challenges and achieving long-term goals. With dedication and shared responsibility, we can create a world where waste is minimized, and resources are valued. The future of recycling holds the promise of a cleaner, greener, and more sustainable planet for everyone.

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(Page 62-70)

Available at: https://doi.org/10.1016/B0-13-370870-2/00012-X

APPENDIX A – SCREENSHOTS

ENTERING USERNAME ID

OPTIONS AVAILABLE IN THE APP

ALERTS REMAINDERS AND CHECK BOX FOR WASTE EXPORTATION

WASTE MANAGEMENT AWARNESS

WASTE EXPOSURE STATS