Deploying the Power of IT-Engaged Youths in Effective Plastic Use and Waste Management

EXECUTIVE SUMMARY:

This project is targeted at reducing the plastic waste that litters neighborhood, clog drainage (resulting in flooding), and mount up refuse dumpsites by using the well-established methodology, tested over the past twenty years of engaging youths and their use of digital technology to proffer solutions for urgent national challenges (the hallmark of DPI's annual computer boot camp, DIGITEST). The project execution procedure includes forming a team of youths with 5 youths each per team. After receiving the basic expository directions regarding the relevant body of knowledge concerning plastics and their wastes, each team will be challenged to generate the ideas, tools, and methods that will contribute to solutions both better ways through which this finding can be disseminated to the concerned communities and other stakeholders for their assimilation. The best of the solutions in the three-tier quest (best plastic production/use practices, best waste management practices, best information dissemination and community engagement methods, and recycling/alternative use of plastic) will be chosen through a weeding process to leave the adjudged best alternatives in these proffered solutions.

STATEMENT OF PROBLEM

The improper management of plastic waste leads to environmental pollution, impacting ecosystems, wildlife, and public health. The high dependence on single-use plastics also exacerbates resource depletion and contributes to climate change. To ensure a greener and cleaner environment, we must address the pressing issue of plastic waste pollution. Plastic waste pollution is a pressing global challenge, and the Federal Capital Territory (FCT) is no exception. The "Trash to Treasure" initiative aims to address this issue by unlocking the FCT's plastic potential through innovative solutions, including developing a networking app that incentivizes responsible waste management. By empowering the community, collaborating with local authorities, and fostering environmental consciousness, the project strives to create a greener, more sustainable future for the FCT.

PROJECT OBJECTIVE:

The project is targeted at reducing the plastic wastes that litter neighborhoods, clog drainages (resulting in flooding), and mount up refuse dumpsites in such a way that they have become perennial environmental challenges;

- Creating awareness of the need for advanced plastic waste recycling through ICT in FCT and Environs

- Guiding community-based youths in the use of digital technology to proffer solutions to plastic waste recycling

- Empowering youths to be plastic waste management ambassadors in their communities through business startups

Youth Engagement Using ICT for Plastic Waste Management

- **Call for Youth Participation:** The process of engaging youth participation for this project commenced with an effective awareness through advertisement on media houses, community-based platforms, and the new media. Out of Four Hundred, and Eighty (480) applicants that applied, 200 participants were carefully and thoroughly selected with the following eligibility criteria, **Age – (15 to 35 years**), **Education (Minimum of SSCE)**, **Skills – (ICT/Basic Computer savvy)**, and **Location – (Abuja and Environs).**

- **Inception Meeting with participants:** Selected youths were engaged in an onboarding session which clearly stated the project objectives, expectations, and deliverables to aid the participants' preparations for the expected outcomes in the use of effective and efficient plastic use and waste management

Training Methodologies, Tools, Processes, and Policies for Implementation

Lectures and Training: The training was carried out through classroom sessions, which included interactive and hands-on practical sessions, dump site visits, and recycling factories within the FCT and environs. Participating youths were engaged in intensive brainstorming sessions for a period of one week which covered the following subjects

- **The science of Plastic**: Plastics are synthetic materials derived from petrochemicals and are known for their diverse properties, including durability, flexibility, and resistance to moisture and chemicals. They are classified into various types, such as Polyethylene (PE), Polypropylene (PP), Polyvinyl Chloride (PVC), Polystyrene (PS), and more, each with unique applications across industries. PE and PP are commonly used for packaging, while PVC finds applications in construction materials and pipes. PS is widely used in disposable utensils and packaging, and other plastics serve specific purposes in electronics, automotive parts, and medical devices. The versatility of plastics has led to their extensive use in modern life.

- **Using Plastics – Products Design, Uses, Specification:** Plastics have become an integral part of our daily lives, offering versatility, durability, and cost-effectiveness. The design, uses, and specifications of plastic products have evolved over the years, contributing significantly to various industries. Designing plastic products involves a careful consideration of the intended purpose, material properties, and manufacturing processes. Designers need to account for factors such as strength, flexibility, and durability while maintaining an aesthetically pleasing appearance. Plastic products find applications across numerous industries due to their lightweight nature, corrosion resistance, and molding capabilities. In packaging, plastics provide a cost-effective and versatile solution, ensuring the protection and preservation of various goods. In the automotive sector, lightweight yet sturdy plastic components contribute to fuel efficiency.

- **State of Plastic Disposal in the FCT:** Plastic waste pollution has become a critical global environmental issue, and the Federal Capital Territory (FCT) faces significant challenges in managing its plastic waste. With increasing plastic consumption and inadequate recycling infrastructure, there is an urgent need to find innovative and sustainable solutions to tackle this problem. The FCT currently faces challenges in managing plastic waste, with inadequate recycling facilities and a lack of proper waste collection systems. The majority of plastic waste is either improperly disposed of in open areas or ends up in landfills, contributing to environmental pollution. The increasing population and urbanization in the FCT have led to a surge in plastic consumption, resulting in a proportional increase in plastic waste generation. This growing volume of plastic waste poses challenges in managing and recycling it effectively.

- **Use of ICT for Research:** Information and Communication Technology (ICT) has revolutionized the landscape of research, providing researchers with powerful tools and resources to conduct studies more efficiently and effectively. The use of ICT in research enhances the entire research lifecycle, from data collection to dissemination. It accelerates the pace of discovery, facilitates collaboration, and democratizes access to information, contributing to the advancement of knowledge across various disciplines.
- **Business Sense of Plastic: Recycled Plastic Products:** Participants were lectured and introduced to business opportunities that lie in plastic use and waste management, from recycling to collection and evacuation to diverse products made from recycled plastics

Site Visitation: the sightseeing and visitation were done in two phases. First, the youths were engaged in a sightseeing visit to the Nasarawa Waste Management Board and their landfill, in Nasarawa State. Secondly, the GOSA landfill through the Abuja Environmental Protection Board (AEPB), and some private plastic production factories such as Impulse Recycling in Abuja and its environs.

1. **Ideas Generated by the Youths:** Out of the suggested ideas generated in the ongoing project, the following are considered for urgent implementation:
   a. Mobile App development for plastic waste management, collection incentives, tracking, and recycling process. This app includes an E-library and Directory Mobile Apps, a Gamified Plastic Waste Management App. These apps serve as a bridge between individuals who collect specific types of plastic waste, recyclers, and collectors. It introduces gamification elements, wherein participants earn credits for their contributions. These credits can be converted into cash or utilized as carbon-saving credits, thus aligning environmental responsibility with financial incentives.
   b. Interlocking Tiles: Converting plastics into interlocking tiles is a practical and sustainable solution that transforms a potential environmental problem into a valuable resource. This process showcases the potential for innovation in recycling practices, providing not only functional products but also contributing to a more sustainable and circular economy.
   c. Development of websites for networking to connect plastic waste collectors with the recycling factories within Abuja and the environs
   d. Establishing Plastic collection and Evacuation management system
   e. Develop a Database Collection on plastic to enforce data-driven decisions in plastic waste management
   f. Organize training and entrepreneurship skills on plastic upcycling to train and empower community members on various ways of alternative uses of recycled plastics.

Project Outcomes.

1. **Collaborations:** From the inception of this project, the following institutions became collaborators for the enforcement of the project:
   a. Abuja Environmental Protection Board (AEPB),
   b. The Federal Ministry of Education
   c. The University of Abuja (Geography and Environmental Faculty).
2. The use of Communication Media: Leveraging media for information dissemination, awareness creation, and sensitization was a powerful strategy in promoting effective plastic use and management, especially when fully engaging youths from different communities in Abuja and its environs. Collaboration with media houses such as AIT, NTA, Channels TV, Clear View TV, and Arise TV, as sources of continuing dissemination of solution efforts and avenues for the persuasion of the public in engagement in solution quest as may be necessary. **Radio Stations,** such as FRCN, and Wazobia FM, and Newspaper media which includes, Guardian Newspaper, Daily Trust Newspaper
3. Internet and Social media: Through social media campaigns, documentaries, and interactive platforms, young individuals were able to play a vital role in spreading knowledge, fostering behavioral change, and building a collective commitment toward sustainable plastic practices within their communities.
4. Training manuals and writing materials
5. Provision of ICT tools such as laptop computers, and internet accessibility for research on idea generation, ability to quickly store and retrieve materials, progress, and results done so far.
6. Provision of hand gloves for hygiene sorting and picking practices
7. Provision of net bags for batch plastic collection in different environments (Apo resettlement area and Durum, Garkii)

Project Achievements and community ownership of the project:

1. Through this project, 35 students and teachers from all Federal Unity College (FUC), 5 students with 2 teachers from Government Science Technical College (GSTC), and 5 students with 2 lectures from the University of Abuja were fully involved in this project, thereby serving as a medium to implement the knowledge acquired.

2. **Project Empowerment and Job Creation**: The winning ideas from the overall idea generated were empowered with some amount to start up their project ideas. These teams are listed as follows

   a. Team 1: Idea tile**: Conversion of plastic waste into interlocking tiles**: This team were students of the Government Science Technical College, Garki, Abuja, with their unique idea came out as the first prize during the idea generation and presentation

b. Team 17, with project title: **Plastic Upcycling and interior plastic furniture design**

c. Team 3: with project tile: Sensitizations: Community-based sensitization to schools, restaurants, churches, mosques, and estates.

d. Plastic Mobile Application Development winners' team.

App 1: Name: Gamified Plastic Waste Management App. The proposed gamified app for plastic waste management emerges as an innovative solution that unites stakeholders, promotes recycling, and rewards responsible behavior. With careful planning and execution, this app can address pressing environmental concerns while providing financial incentives. The DIGITEST Facilitation Team recommends exploring this opportunity as a strategic step toward advancing sustainability through technology.

App 2: Name: Plastic Waste Management Platform (E-Library and Directory): The envisioned plastic waste management platform represents a strategic endeavor to channel prototype projects from DIGITEST 2023 into impactful products. This platform's integration of a stakeholder directory and an e-learning module will empower individuals to collaborate, educate, innovate, and generate revenue within the realm of recycling, reduction, and reuse. The DIGITEST Facilitation Team encourages the exploration of this opportunity to advance sustainability through knowledge sharing, networking, profitability, and mutual benefit.

3. 53 teams (5 participants/team) of plastic waste management ambassadors were impacted to reach out to their communities and schools to mitigate the mismanagement of plastic use and its waste.
4. **Establish and ensure plastic Waste Segregation from source:** Created a new plastic waste collection point in Apo settlement and ensured timely evacuation of plastic waste from homes, markets, schools, and public places in these environs

Project Challenges:

The few challenges observed during the execution of this project include;

1. **Time Factor:** The reality of time to complete and implement the suggested ideas for this project is relatively not sufficient.
2. **Financial constraints**: With the ideas so far generated, as highlighted above, there will be a need to allocate funds to the development of the apps and websites among many others as the budget allocated so far is insufficient to effectively engage the services of software developers.

Conclusion:

In conclusion, leveraging Information Technology (IT) to address plastic waste management presents a powerful and innovative solution to a pressing global challenge. The integration of IT solutions offers a multifaceted approach, providing tools and systems that enhance efficiency, transparency, and sustainability in the management of plastic waste. From smart waste collection and tracking systems to blockchain-enabled traceability, IT initiatives contribute to a more robust waste management ecosystem. In essence, the convergence of IT and plastic waste management signifies a transformative shift towards smarter, more sustainable practices. By harnessing the power of technology, we can create a comprehensive, data-driven approach to plastic waste management that not only mitigates environmental harm but also fosters a culture of responsibility, innovation, and collaboration on a global scale.

We affirmed that the empowerment of youths with Information Technology (IT) skills for plastic waste management is a transformative strategy that not only addresses the environmental challenges posed by plastic waste but also fosters youth engagement, entrepreneurship, and sustainable development.

Thank you.