The LASERS Model: The Development of a Rubric for Assessing "Tech for Good"

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Abstract

This research presents a new model for evaluating software in the "Tech for Good" domain, with a focus on social impact and responsibility. The model identifies six key characteristics essential for ensuring that technology in this domain meets the needs of both society and the environment. These six pillars—Legal, Accessible, Sustainable, Ethical, Reliable, and Secure—form a comprehensive framework for assessing software systems.

- Legal refers to adherence to regulatory requirements, ensuring compliance with industry standards and laws such as GDPR and the EU AI Act.
- Accessible emphasizes the need for inclusivity, ensuring software is usable by people of all abilities, including those with disabilities.
- Sustainable focuses on minimizing environmental impact, as well as exploring the financial and governance issues associated with sustainability.
- Ethical underscores fairness, transparency, and respect for user privacy and autonomy, avoiding manipulation or exploitation.
- Reliable ensures the system functions correctly under various conditions, maintaining stability, availability, and performance over time.
- Secure highlights the importance of safeguarding data and preventing unauthorized access, breaches, or malicious attacks.

This framework is designed to guide developers, researchers, and organizations in building and evaluating software that not only meets technical requirements but also promotes positive social and environmental outcomes. By applying this model, stakeholders can ensure that technology is not only effective but also responsible and beneficial for society.

1. Introduction

"Tech for Good" is an emerging concept which refers to the use of technologies to help solve global and social problems. Hoek (2023) suggests that the "Tech for Good" movement emerged as a response to the growing concern that unchecked technological advancement could exacerbate inequalities and harm vulnerable communities, and that while technology has traditionally been seen as a driver of innovation and efficiency, it must be coupled with ethical frameworks to ensure it serves the public good. Similarly, Viera Magalhães and Couldry (2021) stress that technology should not just be evaluated on its technical performance but also on its societal impact. Their work on algorithmic fairness highlights how biased algorithms can reinforce discrimination, demonstrating the need for accountability in technological systems.

Mulvenna, *et al*. (2017) outline the concept of "ethical design," which refers to embedding ethical principles—such as transparency, fairness, and respect for privacy—into the development process. They emphasize that tech companies and developers have a moral responsibility to consider the long-

term effects of their products on society. This notion is echoed by Fiore (2020), who argue that ethical frameworks must be operationalized into real-world practices within organizations. They propose a set of guidelines to ensure that companies align their technologies with social good, such as conducting impact assessments and fostering diverse development teams to reduce bias. Challenges in "Tech for Good" While the potential for technology to effect positive change is substantial, significant challenges exist.

One critical issue highlighted by Lythreatis, *et al*. (2022) is the digital divide—the gap between those who have access to technology and those who do not. The authors note that while technology can be a tool for empowerment, it can also deepen existing inequalities if marginalized communities are left behind. For instance, access to the internet, digital literacy, and the affordability of tech solutions remain barriers in many parts of the world. Despite the challenges, there are numerous examples of successful "Tech for Good" initiatives. For instance, technology has played a pivotal role in addressing global health crises, such as the COVID-19 pandemic. According to Benjamin (2023), digital tools like contact tracing apps, telemedicine platforms, and data analytics have been instrumental in managing the spread of the virus and providing timely healthcare services. These innovations demonstrate the transformative potential of technology when deployed with a focus on public health. Similarly, environmental sustainability is a growing area where technology is being used for positive impact.

The concept of ethical technology has gained significant attention since the publication of “Weapons of Math Destruction” (O'Neil, 2016) which highlights how algorithmic decision-making can perpetuate societal biases and injustices. In this book, she discusses the role of data-driven algorithms in sectors such as education and employment, where biased training data can lead to discriminatory outcomes. O'Neil emphasizes the need for transparency and accountability in AI systems to mitigate these risks. As AI technologies become increasingly integrated into critical decision-making processes, ethical considerations surrounding bias and fairness become essential.

The issue of data privacy has been extensively studied in the context of technological advancement. Zuboff (2019) explores the implications of surveillance capitalism in her work, “The Age of Surveillance Capitalism”. She argues that companies exploit personal data for profit, often without users' informed consent. Zuboff calls for a re-examination of the ethical framework governing data collection and usage, advocating for stronger regulatory measures to protect individual privacy rights. The ethical dilemmas posed by data privacy highlight the need for organizations to prioritize user consent and transparency in their data practices.

Green Technology (or GreenTech) is research associated with the development of renewable energy sources (Swetloff, 2023), and this goal is critical for reducing global carbon emissions and combating climate change. Wüstenhagen and Menichetti (2012) highlight the need for policy frameworks and financial investments to support the widespread adoption of renewable energy technologies, which can lead to significant reductions in greenhouse gas emissions and energy costs. This transition not only contributes to environmental sustainability but also fosters economic growth through job creation in the renewable energy sector. Green Building Practices Another important aspect of green technology is the design and construction of sustainable buildings. Awadh (2017) explores the principles of green building, and identifies key strategies for enhancing energy efficiency, such as the use of sustainable materials, efficient insulation, and advanced energy management systems. The author argues that green buildings can significantly reduce energy consumption and improve indoor air quality, thereby benefiting both the environment and human health. Their research provides a comprehensive overview of the benefits and challenges associated with implementing green building practices, highlighting the need for further innovation and stakeholder engagement in the construction industry.

2. The United Nations Sustainable Development Goals (SDGs)

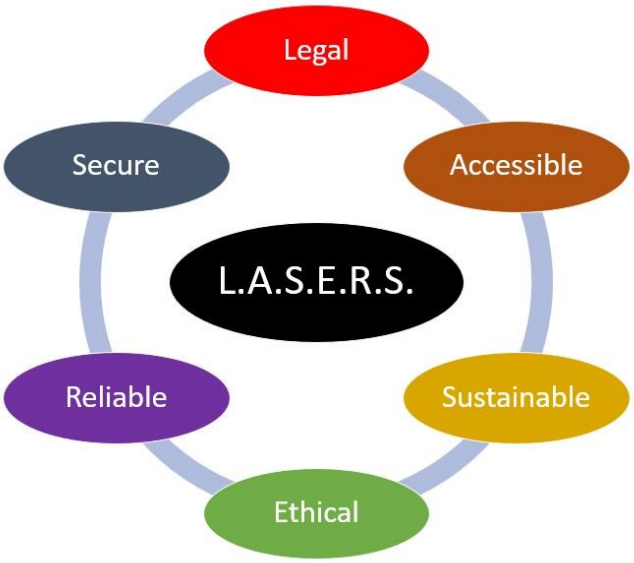
The United Nations Sustainable Development Goals (SDGs) are a collection of 17 global goals established by the United Nations in 2015 as part of the 2030 Agenda for Sustainable Development (Carlsen and Bruggemann, 2022). They serve as a universal call to action to end poverty, protect the planet, and ensure peace and prosperity for all by 2030. The SDGs are integrated, meaning they recognize that actions in one area will affect outcomes in others, and they balance social, economic, and environmental sustainability. Here are the 17 SDGs:

1. No Poverty: End poverty in all its forms everywhere.
2. Zero Hunger: End hunger, achieve food security and improved nutrition, and promote sustainable agriculture.
3. Good Health and Well-being: Ensure healthy lives and promote well-being for all at all ages.
4. Quality Education: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
5. Gender Equality: Achieve gender equality and empower all women and girls.
6. Clean Water and Sanitation: Ensure availability and sustainable management of water and sanitation for all.
7. Affordable and Clean Energy: Ensure access to affordable, reliable, sustainable, and modern energy for all.
8. Decent Work and Economic Growth: Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all.
9. Industry, Innovation, and Infrastructure: Build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation.
10. Reduced Inequalities: Reduce inequality within and among countries.
11. Sustainable Cities and Communities: Make cities and human settlements inclusive, safe, resilient, and sustainable.
12. Responsible Consumption and Production: Ensure sustainable consumption and production patterns.
13. Climate Action: Take urgent action to combat climate change and its impacts.
14. Life Below Water: Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.
15. Life on Land: Protect, restore, and promote sustainable use of terrestrial ecosystems, manage forests sustainably, combat desertification, and halt and reverse land degradation and halt biodiversity loss.
16. Peace, Justice, and Strong Institutions: Promote peaceful and inclusive societies for sustainable development, provide access to justice for all, and build effective, accountable, and inclusive institutions at all levels.
17. Partnerships for the Goals: Strengthen the means of implementation and revitalize the global partnership for sustainable development.

These goals provide a shared blueprint for peace and prosperity for people and the planet, now and into the future, and are designed to be inclusive, with a focus on leaving no one behind. Each SDG also has specific targets and indicators to track progress.

3. Model Development

After exploring some of the literature associated with “Tech for Good”, a Thematic Analysis (Braun and Clarke, 2012) was used to identify recurring themes and concepts across the literature, which in this case turns out to be the following six dimensions - Legal, Accessible, Sustainable, Ethical, Reliable, and Secure. It is worth noting that each dimension is distinct yet interconnected to the broader framework of "Tech for Good".



Some considerations under each dimension include the following:

- Legal - including Laws, Acts, Statutes, Regulations and Rights.
- Accessible - including Usability, Inclusiveness, and Universal Design.
- Sustainable - including Social, Environmental and Governance.
- Ethical - including Fairness, Accountability, Responsibility, and Respect.
- Reliable - including Availability, Scalability, Efficiency, and Maintainability.
- Secure - including Validation, Encryption, Auditing, and Privacy.

Below in the Appendix are two documents, the first are some sample questions designed to facilitate the exploration of the six dimensions of "Tech for Good" in the LASERS model. This set of inquiries aims to guide individuals and organizations in assessing both the specific themes of each of the dimensions, as well as the overall considerations of “Tech for Good”. The second is a scoring rubric that could be used to evaluate how successfully a software tool adheres to the criteria outlined in the LASERS model.

4. Discussion

The LASERS model provides a structured, comprehensive framework to guide the creation, evaluation, and deployment of technologies designed for social impact. Such a model ensures that technology aligns with ethical, legal, and social standards, enhancing its effectiveness and sustainability in addressing real-world problems. The benefits of establishing a model are both practical and strategic, allowing stakeholders to design technology that is not only innovative but also responsible and inclusive.

A model provides a multi-dimensional approach to evaluating "Tech for Good" software, considering factors such as ethics, security, accessibility, sustainability, and more. Without a clear framework, technology development often focuses on functionality or innovation without addressing broader social implications. By integrating various dimensions into a unified model, developers and organizations can assess a system's overall impact, ensuring that it benefits users and society as a whole. This holistic perspective fosters accountability, helping to prevent potential harm or unintended consequences.

One of the key benefits of the LASERS model is the establishment of consistent standards that can be applied across different projects and sectors. Models provide clear criteria for what constitutes socially responsible technology, reducing ambiguity and ensuring that all stakeholders are working toward shared objectives. This consistency enables better communication between developers, regulators, and users, while also making it easier to scale solutions across different environments. Standardized approaches ensure that essential elements—such as privacy, accessibility, and security—are not overlooked during the development process.

Additionally, the clear guidelines offered by a model can help identify gaps in current technologies, encouraging the development of novel solutions to pressing societal challenges. This strategic approach helps maximize the positive impact of technology while mitigating risks, making it an essential tool for developers and organizations committed to responsible and impactful tech development.

5. Summary and Conclusions

This research introduces a new model for evaluating software within the "Tech for Good" domain, built around six key pillars—Legal, Accessible, Sustainable, Ethical, Reliable, and Secure—that form a comprehensive framework for assessing software systems. The Legal pillar ensures regulatory compliance, such as with GDPR and the EU AI Act. Accessible promotes inclusivity, ensuring usability for individuals of all abilities. Sustainable addresses environmental impacts and the financial aspects of sustainability. Ethical focuses on fairness, transparency, and respect for privacy and autonomy. Reliable guarantees the system’s functionality and performance over time, while Secure safeguards against unauthorized access and cyber threats. Ultimately, the goal of this model provides a practical tool for developers, researchers, and organizations to create software that is not only technically sound but also aligned with positive social and environmental objectives.

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The LASERS Model Checksheet

Students pick 4 out of the 6 themes below that are most relevant to their project, and have a section entitled "Social Good" where they answer some of the questions below regarding that theme.

Stage	Questions
Legal	• *Does the system adhere to all relevant legal regulations?* • *Is the system GDPR compliant (including informed consent, transparent data policies, and necessary security measures)?* • *Are there any potential intellectual property issues associated with the system (including patents, trademarks, or copyrights)?* • *Does the system comply with relevant industry regulations and standards?*
Accessible	• *Does the system consider the needs of diverse user groups (including age, size and disability)?* • *Does the system meet the needs of users with various disabilities (including visual, auditory, motor, or cognitive impairments)?* • *Has the system undergone accessibility testing with users representing diverse abilities?* • *Does the system comply with recognized accessibility and usability guidelines (such as the Web Content Accessibility Guidelines)?*
Sustainable	• *Is the system economically viable in the long term (including the cost-effectiveness of production and upgrade)?* • *What is the environmental footprint of the system, considering all stages of the system from production to disposal?* • *Does the system promote resource efficiency and responsible consumption?* • *Does the system impact social equity (including the impact on communities, and individual well-being)?*
Ethical	• *If the system is involved in decision-making processes, are there mechanisms to ensure explainability and fairness?* • *Is there clear accountability established for the system's actions?* • *Does the system avoid contributing to digital divides?* • *Does the system comply with ethical guidelines and frameworks?*
Reliable	• *Does the system have good error checking and error prevention?* • *Does the system incorporate fault tolerance mechanisms to handle unexpected failures?* • *Is the system always stable, and does it perform consistently?* • *Has the system undergone stress testing and performance optimization?*
Secure	• *Does the system handle any data being used in a secure way (adhering to any relevant data protection policies and mechanisms)?* • *How are user access controls implemented, and is multi-factor authentication used?* • *What measures are in place to secure the system with respect to its connection to the internet and other networks?* • *Has the system undergone security testing, including penetration testing and code reviews?*

The LASERS Model Rubric

Students pick out of the themes below that are most relevant to their project.

	Poor (0-6%)	Fair (7-12%)	Good (13-19%)	Excellent (20-25%)
Legal	Little or no mention of legal considerations of their system.	Some consideration given to the legal issues, mentioning some of the key legislation, but with no real discussion of their relevance to this system.	Good consideration given to the legal issues, discussing some of the key legislation, but with only a little discussion of their relevance to this system.	Extensive consideration and discussion of relevant legal and regulatory standards, including GDPR and intellectual property.
Accessible	Little or no mention of accessibility considerations of their system.	Some consideration given to the accessibility issues, mentioning some of the key frameworks, but with no real discussion of their relevance to this system.	Good consideration given to the accessibility issues, discussing some of the key frameworks, but with only a little discussion of their relevance to this system.	Extensive consideration and discussion of relevant accessibility frameworks and standards, including WCAG and diverse user groups.
Sustainable	Little or no mention of sustainability considerations of their system.	Some consideration given to the sustainability issues, mentioning some of the key frameworks, but with no real discussion of their relevance to this system.	Good consideration given to the sustainability issues, discussing some of the key frameworks, but with only a little discussion of their relevance to this system.	Extensive consideration and discussion of relevant sustainability frameworks and standards, including economic, environmental, and social considerations.
Ethical	Little or no mention of ethical considerations of their system.	Some consideration given to the ethical issues, mentioning some of the key frameworks, but with no real discussion of their relevance to this system.	Good consideration given to the ethical issues, discussing some of the key frameworks, but with only a little discussion of their relevance to this system.	Extensive consideration and discussion of relevant sustainability frameworks and standards, including explainability, accountability and fairness.
Reliable	Little or no mention of reliability considerations of their system.	Some consideration given to the reliability issues, mentioning some of the key mechanisms, but with no real discussion of their relevance to this system.	Good consideration given to the reliability issues, discussing some of the key mechanisms, but with only a little discussion of their relevance to this system.	Extensive consideration and discussion of relevant reliability mechanisms, including fault tolerance, error detection, and performance testing.
Security	Little or no mention of security considerations of their system.	Some consideration given to the security issues, mentioning some of the key frameworks, but with no real discussion of their relevance to this system.	Good consideration given to the security issues, discussing some key frameworks, but with only a little discussion of their relevance to this system.	Extensive consideration and discussion of relevant security frameworks and standards, including data security, network security and authentication.