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How Can Companies "Go Green" with Their Software?

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ABSTRACT

An increasing number of companies are setting stricter and more defined guidelines on their relationship between software and energy consumption in order to take greater responsibility for their impact on the environment. However, “going Green” can be easier said than done, and most certainly does not happen overnight. So, how can companies go Green with their software? What does that process look like, how much does it cost, and how long does it take? A three-part process articulated by a group of researchers suggest deploying the following process is the best approach to “Going Green”:

- Review and refine the software development life cycle
- Articulate a strategy that guides trade-offs and allows for flexibility
- Make the cloud green

METHODOLOGY

The research conducted was based on a systematic literature review with the goal to integrate findings and perspectives from other empirical findings.

BACKGROUND

Software is a key component in creating solutions to tackle many problems we have in the world today. By itself, software isn’t harmful to the environment. However, as the software grows, so does the need for increased capacity of hardware, meaning an exponential growth in the consumption of energy.

It is estimated that by 2040, the information and communications sector as a whole will account for 14% of the world's carbon footprint.

It is estimated that the energy needed to maintain the Bitcoin network is more than the entire nation of Switzerland.

Training a single neural network model can emit as much carbon as five cars in their lifetime.

At this point in time without an alternate solution, we can't limit our reliance on software. This is why it is crucial that companies make green software an integral part of their sustainability efforts and commit themselves to re-thinking, re-designing, re-developing, and re-deploying new ideas.

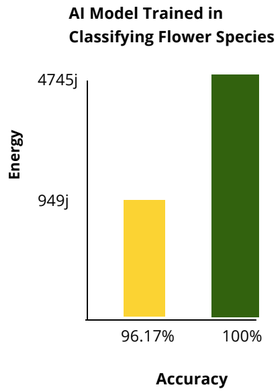
FINDING 1

Review and refine the software development life cycle.

To guide the first stages of the software development cycle ask “What is the smallest possible environmental footprint we could make with this application?” Then require constant assessment of alternatives that might be more efficient and commit to tracking energy consumption in real time.

FINDING 2

Articulate a strategy that guides trade-offs and allows for flexibility.



There are, and will continue to be, trade-offs in business and environmental goals. Companies need to have boundaries set so they can determine if the last jump in accuracy (a 3.83 difference) is worth 400% more energy. Being flexible is equally important, as Green Software is an emerging field of study with few guidebooks or resources to learn from.

FINDING 3

Make the Cloud Green.

Today, data centers consume about 2% of global electricity. It is estimated that by 2030, that number will be at 8%. Companies should focus on optimizing hardware, reducing carbon emissions, eliminating duplicate copies of data, and deploying graphic-processing units.

CONCLUSION

Beyond fulfilling the moral and ethical obligations that “Going Green” has, another huge reward is that companies who prioritize this will be ahead of the game and become an attractive prospect for potential investors, current stakeholders, and future employees. The long-term benefit of building green software is that the products will be higher-quality, leaner and cleaner, which makes them cost efficient in the long run. Following these four steps will help companies and organizations start down the path of "Going Green" with their software.

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