BRIEFING NOTES

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VULNERABILITIES OF TECHNOLOGY: A FRAMEWORK TO LOOK INTO THE IMPACT ON HUMAN ACTIVITY

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SUMMARY

- This note examines how weaknesses in modern technology affects our lives and proposes a framework to help identify those weaknesses and how humans are impacted.
- The framework offers six areas where the impact of technology is more greatly felt. These are:
    - Jobs and employment
    - Medical/Health issues
    - Privacy/Security
    - Ethics
    - Governance, Law and Public Policy
    - Public Trust
- Scientists, engineers and business people are encouraged to use the framework to reflect on how their work and creations will impact human activity, whether in a positive or negative way.

CONTEXT

- In this briefing note, the proposed framework is a reflection or discussion tool to help identify areas where technological vulnerabilities can affect people in unforeseen ways.
- Most research concentrates on specific areas of technology. We have had many warnings about the effects of Artificial Intelligence and how we ignore them [1], how we fail to understand the impact [2], the unseen risks [3], or how it could end mankind [4].
- The interconnection and comorbidities of various vulnerabilities has rarely been addressed. This briefing note attempts to establish a framework of technology vulnerabilities and impacts into six main areas that affect human endeavour.
- Against this framework the purpose of this note is to create the self-examining questions: “How does technology impact or where is it vulnerable in [areas 1 to 6]”.
- Before proceeding with development of new technologies, designers, engineers, computer scientists and managers should attempt to mitigate the impacts in all or most of these spheres.

CONSIDERATIONS

- Jobs and unemployment.
    - We often blame technology for destroying jobs. We also hear numerous claims that new types of jobs are created by technology.

- A common misconception is that immigration causes job losses. In many cases, this is baseless, as many jobs are lost to automation. When Greg Hayes, the chief executive of United Technologies, agreed to invest $16 million in one of its Carrier factories as part of a Trump deal to keep some jobs in Indiana instead of moving them to Mexico, he said the money would go toward automation. "What that ultimately means is there will be fewer jobs," he said on CNBC [5].
- In 2016, CBS News reported that Donald Trump blames Mexico and China for the loss of manufacturing jobs, but that automation was more to blame. America has lost more than seven million factory jobs since manufacturing employment peaked in 1979.

- Medical/Health issues.
  - Several negative health issues can be associated with technology; we have often heard of addictions to technology.
  - Automated medical devices can have disastrous effects on people if they go wrong.
- Privacy/Security.
  - Research by Chen and Zhao [6] indicate that "According to a survey from IDCI in 2009, 74% IT managers and CIOs believed that the primary challenge that hinders them from using cloud computing services is cloud computing security issues.
  - What happens to our personal information in the hands of unscrupulous corporations or hackers?
- Ethics.
  - Technology has created innumerable opportunities for criminals. According to Chan et al. [7], "In our most conservative definition of prostitution count (Model 7), site entry [to Craig's List] leads to a 17.58% increase in prostitution incidence."
  - Cyberbullying has become a growing problem with sometimes tragic outcomes.
  - Machine Learning (Artificial Intelligence) systems are "trained" using huge datasets that are sometimes biased. This injects 'unfairnesses' into the conclusions of the AI system.
- Governance, Law and Public Policy.
  - Legislation pertaining to technology issues is lagging far behind other societal issues.
  - The cost of constructing rules of governance may be a hindrance to their implementation.
- Public Trust.
  - Is technology and artificial intelligence a factor of moral atrophy? Will we abdicate our social and moral responsibilities because we think the machine can do better than us? Will our morals atrophy as we blindly rely on the machines?
  - As noted by Schwarz: "AI is becoming structural, institutional and pervasive as a powerful but near-invisible organizing principle for the body politic. The human, in turn, becomes 'the last analogue object in a digital universe' with limited capacity for 'data input and output'." [1].

- “Fake News” and “deep fake” videos are eroding public trust. Many people are unsure as to where they should get reliable information.

NEXT STEPS (If applicable)

- We are becoming increasingly reliant on technology. Applying the framework would give us the perspective required so that technology will offer solutions and not more problems.
- We must be wary of both the erosion of public trust in technology and the simultaneous blind faith in technology.
- Engineers, programmers, scientists and business people should apply the framework and be self-reflective before boldly applying technology simply for profit.

REFERENCES

[1] Schwarz, E., 2019. Günther Anders in Silicon Valley: Artificial intelligence and moral atrophy. Thesis Eleven 153, 94–112. https://doi.org/10.1177/0725513619863854

[2] Jaume-Palasi, L., n.d. Why We Are Failing to Understand the Societal Impact of Artificial Intelligence 23.

[3] Parnas, D.L., 2017. The real risks of artificial intelligence. Commun. ACM 60, 27–31. https://doi.org/10.1145/3132724

[4] Cellan-Jones, R., n.d. Stephen Hawking warns artificial intelligence could end mankind 18.

[5] Miller, C.C., n.d. The long-term jobs killer is not China. It's automation. New York Times 2.

[6] Chen, D., Zhao, H., 2012. Data Security and Privacy Protection Issues in Cloud Computing, in: 2012 International Conference on Computer Science and Electronics Engineering. Presented at the 2012 International Conference on Computer Science and Electronics Engineering, pp. 647–651. https://doi.org/10.1109/ICCSEE.2012.193

[7] Chan, J., Mojumder, P., Ghose, A., 2019. The Digital Sin City: An Empirical Study of Craigslist's Impact on Prostitution Trends. Information Systems Research 30, 219–238. https://doi.org/10.1287/isre.2018.0799