Eastern Visayas State University

Information Technology Department

Bachelor of Science in Information Technology

Group 7 – Reflection Paper

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BSIT – 3B

Multimedia technologies has transformed the manner by which individuals interact, communicate, and exchange information. Multimedia combines text, images, audio, video, and animation to maximize engagement and interactivity in numerous sectors, including but not limited to education, entertainment, healthcare, and business (Sharma & Gupta, 2020). Still, the increased use of multimedia is coupled with challenges such as compatibility problems, accessibility limitations, storage constraints, and security threats. Addressing these various challenges in this new innovative landscape of media is the unique problem of our time in the 21st century.

One of the first challenges encountered in the history of development of multimedia applications is the incompatibility of file formats and playback between different devices and platforms. Users can be frustrated by the inability to access content because of software constraints or outdated systems. To counteract this, developers and creators of content must embrace commonly accepted formats developed for standardization like MP4 for video, PNG and JPEG for photographs, and normalized HTML5 and CSS3 for web-based multimedia (Brown, 2019).

Another unique and still pervasive problem is ensuring multimedia accessibility for individuals with disabilities. Most multimedia resources, especially legacy ones, are not accessible, which excludes visually impaired or hearing-impaired users. Adding accessibility features like subtitles, closed captions, screen readers, and alternative text descriptions can greatly enhance usability. Newer methods addressing accessibility has seen mainstream attention, such as speech-to-text and text-to-speech capabilities driven by AI making multimedia resources more inclusive for everyone (World Wide Web Consortium [W3C], 2021).

A big problem especially in our more modern era of multimedia technology is that high-resolution multimedia content demands necessitate large files, which necessitate high storage and bandwidth needs. This becomes a challenge to companies and ordinary users with insufficient resources. Scalable storage from cloud computing offerings like Google Drive, Dropbox, and AWS S3 addresses storage challenges for dealing with large multimedia files (Smith et al., 2022). Another layer complicating this problem is the

fact that big data and its storage require vast amounts of resources and energy, which presents a problem in environmental sustainability in providing the necessary energy for these electricity-hungry data centers. Additionally, advanced compression algorithms like HEVC (H.265) for videos and WebP for images reduce file sizes while maintaining quality, optimizing bandwidth consumption.

Multimedia programs tend to contain sensitive information and are, therefore, susceptible to cyber-attacks in the form of unauthorized access, data theft, and digital piracy. Strong security protocols, such as encryption, digital rights management (DRM), and blockchain technology, have to be instituted by organizations to safeguard multimedia resources from unauthorized circulation and cyber-attacks (Doe, 2023). System updates and user authentication processes enhance the security of multimedia platforms further. The field of cybersecurity exists as a vibrant and dynamic field dedicated to addressing the challenges to privacy and security of our data in this new big data world.

Finally, the most recent development of both a solution to existing challenges of multimedia technologies as well as its own unique challenge itself is the role of artificial intelligence in meeting multimedia challenges. AI-based solutions can improve image and video quality, automate translations and captioning, and even optimize media files for quicker delivery. Machine learning algorithms also facilitate content personalization, enhancing the user experience through recommendation of similar multimedia content to the user as per their choice (Lee & Kim, 2023). However, there are various ethical and legal issues regarding AI and automation regarding intellectual property and fair use as well as in regards to ethical data collection. AI is a complicated tool that must be understood as neither inherently bad nor good but as a force for either depending on how it is used and utilized and the impacts that it may have to everyone involved.

In conclusion, multimedia technology continues to revolutionize contemporary landscape as a whole from communication and connectivity to education and business. Properly identifying its problems and issues then rectifying them with the correct solutions for the benefit of the people is crucial in order to have a smooth and accessible experience for everyone. By embracing standardized file formats, promoting accessibility, minimizing storage, fortifying cybersecurity, and utilizing AI-powered automation, sectors can achieve the full capacity of multimedia uses. With developing technology, constant innovation will be required to resolve upcoming challenges and enhance multimedia use globally. It is imperative for people to understand that the development of multimedia technology requires public oversight and transparency to ensure that the challenges and problems faced by its development is available to its stakeholders but also to ensure the democratic and cooperative forward-thinking solution-driven thinking that brings everyone's ideas to the table towards fixing the various problems discussed earlier. With the innovation of technology and the oversight of the greater public we can ensure a stable and equitable future for everyone involved.

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