

REFLECTION ON THE PERPETUAL RECIPROCAL DEMAND FOR INNOVATION BETWEEN TECHNOLOGY AND THE ARTS

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Abstract

The paper is intended to excite a conscious awakening of understanding the old-aged mutual relation of reciprocal demand for innovation between the arts and technology. The importance of encouraging such a perpetual relationship highlighting the fact that, development in one area invariably leads to new innovation in the other and vice-versa. In fact, the relationship is so cordial that many fail to realize that there is any affinity between the two. It is this assumption as taken for granted that incite the authors to reflect and make conscious effort to bring the relationship once more to light, so that conscious effort can be made by organizations and able individuals to promote such a relationship with the hope that more and more innovations both in technology and the arts can be achieved in future.

Keywords: Arts, Technology, Relationship, Innovation.

Introduction

Technology and the arts can be considered to have a parallel relationship by many, yet, there are some important links, similar to those found in the commercial, industrial and legal sectors. However, technology and the arts have a long standing affinity and special relationship that penetrates all stages of human development (Machiavelli, Sonn, David and Brian, 2013). In fact, this relationship comes to mind with every mention of the word technology, originating from the Ancient Greek *tékhnē*, meaning art. From the first paintings to the production of musical instruments and contemporary cinema, art as we understand it today could simply have been impossible without recourse to humanity's historical reserve of technological development (Gwangua, Zu Khen, & Philip, 1987).

From history to modern day, technologies ranging from ink, paper and glass to cameras, microphones and computers have made the development of new forms of art possible. Without these products, it would be impossible to realize the paintings, ornaments, photography, cinema and contemporary digital works that fill our museums and galleries today. Looking at art

this way prompted a key question:

'How does technological development enable new dimensions of artistic endeavor?'

The reversal of this relationship is also possible, with the arts driving innovation and generating substantial demand on technology. In the course of their work, artists often develop new techniques and push the boundaries of the imagination in ways that can provoke new directions in technological development (Geofrey, 2015). Varied activities in the arts; (from preserving and restoring ancient works to producing stunning visual graphics and immersive environments), generate substantial demand for innovation. Demand for technology is also evident in the consumption of art, as in the use of audiovisual equipment and content. Looking at technology in this way invites another crucial question: How do artistic endeavors enable new dimensions of technological development? The two questions reveal different perspectives of the same deep synergetic relationship between technology and the arts. They buttress each other, and the outcomes are valuable for artists and technologists at the same time also providing wider social, cultural and economic benefits.

This invites a potentially third question: How can the reciprocal relationship between technology and the arts be optimized to maximize its benefits? In this context, Boucher, (2019) delved in to a study of these questions in consideration of the past, present and future of the synergetic relationship between technology and the arts. The first study, as Boucher, found out was conducted by Artshare (2000), who reviews historical developments from cave paintings to photography. While the second, conducted by Nesta, (2012) focuses on the digital era. The Nesta study (more relevant to the interest of this article), comprises a review of trends related to technology and the arts that could become more pronounced in future. Although these are not certain, they seem reasonable and serve to accentuate the growing importance of understanding the relationship between technology and the arts. Trends identified in the Nesta studies include:

- Greater demand for products and services that combine artistic and technical skills in a wider range of domains, as well as greater capacity of companies to deliver them.
- Breakthroughs in the application of virtual and augmented reality creating new platforms for artistic expression.
- Growing proliferation of games and gaming platforms, making links between creative activities and other fields, such as artificial intelligence and machine learning.
- More accessible digital tools (AutoCAD, Photoshop, Corel Draw, Macro-Media Dream Weaver software applications for example), with more people using lots of similar software for creative purposes in a wide range of contexts.
- Greater collaboration, driven by the need for a wider range of highly specialist skills from across the increasingly broad technology-arts sector in order to deliver more ambitious projects.
- Increased pervasiveness of artificial intelligence in the creative sector as recommendation systems are used more often, and become more accurate and

influential.

- The emergence of 'creative artificial intelligence' which produces content for mass consumption or even generating personalized content for individuals in real time.
- Greater collective participation in artistic projects, blurring the boundaries between producers and consumers.
- Increasing role of data, as a pervasive internet of things diminishes the boundary between physical and analogue spaces.

The benefit of the research may include;

1. Promoting all forms of artistic and technological innovation independently.

Considering the deep synergies between technology and the arts, development in one sector tends to lead to benefits for the other, there is the need as Musa (2017) suggested, for research organizations and other relevant institutions to simply support artistic and technological development activities independently, and trust that connections will result from the strength of their mutually beneficial relationship. This can be done through;

- Promoting all kinds of artistic activity by funding artists to explore ideas and concepts within and beyond the cultural sector which in turn can stimulate technological innovation in the same ways that artistic activities always have. This includes developing new technologies and applications and fostering demand for artifacts. Artistic activities could also create wider cultural value related to technology, for example in helping society to make sense of humanity in the digital era.
- Promoting all kinds of technological innovation can also stimulate artistic and creative activities, sometimes in surprising ways. In developed countries, as Ephraim, Rabo, Judith, & Suleiman, (2021) highlighted, Artificial intelligence, for example, has several important links with both the production and consumption of art, from tools that recommend creative content that consumers may appreciate, to the autonomous machine generation of sound

and images. Another good example is 3D printing (a computer Aided sculpting and building tool that can be used in construction industries to build structures using specialized cement) which offers new medium for creativity that may be more accessible to individuals with less technical capabilities or fewer financial resources.

2. Promote artistic activities in technology domains and technology use in artistic activities

This could include stimulating artistic activities within technology domains, which could help add social and cultural value to innovation processes and enable them to pursue broader or more ambitious goals. On the other hand, it could involve stimulating the use and development of innovative technologies (or the purchase thereof in the case of a developing nation like Nigeria), as part of the artistic process, which could help artists to make greater use of technological capabilities and lead to more interesting applications of innovation, as well as more innovative forms of art in this regard it is pertinent to engage in promoting or establishing artist residencies (where they are not already done) within technology research centers. This according to Boucher, (2019) could add value to innovation processes and allow parallel exploration of other avenues , through the addition of artist-led sub-objectives.

- Encouraging technology developers to participate actively in artistic activities from the early stages of projects could help artists to make more effective use of technologies and push the boundaries further than might otherwise be possible.
- Instituting prizes (by e.g. TETFund) for art that makes use of innovative technologies could provide a greater incentive for artists to make use of technologies in their work. Such artistic pieces tend to be comparatively expensive and are considered to have a smaller market.
- The aims of the prize could be refined, for example to focus on supporting Nigeria-Foreign collaboration. Depending on the aims, the program could provide mechanisms

for accessing resources such as equipment, expertise and communications channels, as well as finances.

- Adjusting the definition of research and development to embrace research and development within the arts sector could enable more artistic activities particularly those that make innovative use of advanced technologies to access the funding and support mechanisms that already exist. This could mean extending the definition to embrace knowledge creation and project outcomes related to experiences.

3. Develop understanding of and appreciation for synergies between technology and the arts

The third option, focus on enhancing our recognition of the synergetic relationship between technology and the arts, in particular to fill gaps in our understanding of those activities that do not neatly fit into either category.

- Data science techniques, such as machine learning, can be applied alongside more traditional methods, such as surveys and interviews, to analyze how ecosystems of digital creative activities emerge. The Nesta report showed how European success stories tend to emerge from cities that perform well in the European Digital Cities Index. By understanding these correlations and exploring the conditions that foster success, lessons can be learnt that might be transferable to other locations.
- Job roles at the art-technology interface are not always captured in industrial analyses, which can struggle to capture the importance of fast-changing sectors that do not neatly fit into one category. Initiatives could be launched to explore the full extent of the industry that straddles these sectors, allowing a better-informed reflection on the job market as well as other key indices and future projections. This knowledge can inform the development of strategic policies to support art and technology effectively, and provide evidence to justify the implementation of further programs.

4. Promote collaboration between engineers and artists.

Policies can of course, directly promote collaborations between artists and technology developers, as equal partners, with the aim of stimulating synergies.

- One approach could be to create groups that include technology developers and artists, and deploy them to design and implement projects that respond to real-world challenges. The challenges could have socio-cultural, infrastructural or environmental aspects, such as the organization of specific communities or activities in rural and urban contexts.
- While collaboration may be considered the norm for larger technology projects, as well as major commercial activities from the cultural sector, (such as film making and game design), the stereotype of the lone artist and inventor persists in popular imagination as well as some funding models.
- Developing funding programs that recognize the role of cross-sectoral collaboration could help bring together actors with complementary specialist skills.
- While digital technologies can make it easier to overcome geographical distances and collaborate with a wider range of actors, some spaces and activities have less access to the required tools and expertise. Programs could focus on overcoming these digital divides, but also on ensuring that initiatives are not exclusively digital concern and include actors that, for whatever reason, tend to work offline.

5. Promote skills development that spans art and technology

Finally, policies could promote skills development that capitalizes on synergies to develop the next generation of innovators in technology, the arts and beyond.

- While technology and art are often separate parts of school curriculums and university structures, creating spaces where they are combined at all levels of the education system could help students to develop interdisciplinary skills and enable them to work more effectively with people from other disciplines.

- Developing skills and experience in using open source technologies which are distributed and can be modified by any individual could support individuals in later specializations in technology and the arts. Open source makes powerful tools more accessible in terms of both financial resources and expertise, and often attract supportive knowledge-sharing communities, which can offer encouragement, advice and even collaborative partners that can help people to realize projects.

- While software and hardware are both increasingly accessible, artists working at the cutting edge of technological innovation need advanced skills to work effectively. Promoting artists to develop these skills could not only help them to realize their own projects, but could also contribute to even more accessible interfaces for the next generation of digital tools. Programs could target all stages of creative careers, starting with all levels of digital literacy.

Conclusion

The role of technology in art is sometimes self-evident, for example in the case of immersive digital environments. In other cases, it is less clear and can easily be overlooked by the audience. Many young minds inspired by graphics in films, for example, may not appreciate the range of technical and scientific skills that are required to achieve them. Education programs could deliberately blend art and technology in ways that support students to understand the range of skills that are involved, perhaps, to identify specialist roles of which they might otherwise not have been aware.

Technology as (Uka, 2015) pointed out is nothing but art enshrined in the tenets of science pedagogies. The need to continue develop the realm of artistic explorations is inversely the need to expand the sphere of technological exploration and in doing so bring out new jobs, endless possibilities in social, material and ideological activities.

Recommendations

The points itemized above suffice to serve as ways forward for ensuring the need for putting substantial interest in the encouragement of artists and technologists alike to continue experiment with new ideas so that researchers in both the arts and technology can be in a convenient state to come up with new and tangible ideas that can

assist future contributions in these fields by scholars and professionals alike. Curriculum planners can also instill challenging topics for educational discussions and coach students to be conversant with the interactive class which will open up their creative horizons. No further recommendations necessary, other than those already enumerated in the body of the text above.

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