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Use of the Internet by West Papua Indigenous People: Anthropological Approach and Implications

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ABSTRACT

This research discusses the impact of Technological and Scientific Anthropology on the Papuan people. The main issue discussed is how advances in the field of Anthropology Technology and Science have affected the indigenous Papuan people in terms of health, education, economics, politics, social and culture. The research methods used include literature analysis, interviews, participant observation in the field and case study analysis. The research results show that the Anthropology of Technology and Science has brought significant changes to urban and suburban Papuan communities in general, including increased access to health services, more inclusive education, new economic opportunities, and broader political participation. However, internet use is still dominated by non-Papuans. There are no internet facilities for the public and internet facilities are still dominated by one service provider, which results in market monopoly without healthy competition in Tanah Papua. The main contribution of this research is to provide a deeper understanding of how interactions between technology, science and indigenous peoples have shaped social and economic dynamics in Papua, and to provide a basis for developing policies that better meet the internet access needs of Papuan people.

Keywords: Anthropology; Internet; Culture; Papua; Science and Technology.

INTRODUCTION

Anthropology of Technology and Science is a field of study that explores how modern technological and scientific developments affect society and culture. In Papua, a region rich in cultural and natural diversity, the impact of modern technology and science can bring significant changes to the daily lives of indigenous people. This paper will explore how these developments affect identity, power and values in indigenous Papuan communities.

One of the impacts of modern technology and science in Papua is changes in the way indigenous Papuans access information. Advances in communications technology, such as the internet and smartphones, have enabled indigenous Papuans to connect with the outside world more easily. This can bring benefits in terms of access to information about health, education, politics, economic opportunities and other areas. However, at the same time, this progress can also introduce new cultures and values that conflict with local traditions.

The development of science and technology also influences the traditional way of life of Papuan indigenous people. For example, the introduction of modern agricultural technology can change subsistence farming practices that have existed for centuries. This can change the relationship between humans and the environment and influencing the value system and environmental sustainability.

In the context of power, the introduction of modern technology and science can also strengthen or weaken existing power structures in Papuan indigenous communities. For example, the use of information technology by foreign governments or companies could provide greater access to Papua's natural resources, which in turn could threaten the sovereignty and sustainability of indigenous communities. However, not all impacts of modern technology and science in Papua are negative. In

some cases, technology can be used to preserve and strengthen local culture. For example, a digital documentation project of oral traditions or efforts to utilize renewable energy technology in environmental conservation efforts.

It is important to remember that any changes brought about by modern technology and science must be seen in the context of local Papuan culture and values. What may be considered progress from a Western perspective is not always what Papuans want or accept. Therefore, it is important to involve local communities in the process of developing modern technology and science and consider the cultural, social and environmental implications of any innovation or change. Only with a holistic approach and based on respect for Papua's cultural diversity, it is hoped that the development of modern technology and science will bring sustainable benefits to the Papuan people.

In the era of globalization and rapid technological progress, the Papuan people have not escaped the impact of social and cultural changes caused by the adoption of modern technology and developments in science. Papua, as a region rich in cultural and environmental diversity, is an interesting background to study in this context. This research focuses on an in-depth understanding of how technology and science influence indigenous Papuan communities, as well as their implications for cultural identity, power structures, and social values.

A literature review shows that although there has been research on the impact of technology and science on society in various regions, specific research on Papuan indigenous peoples is still limited. Previous research has revealed how modern technology can change patterns of social interaction, social structure, and cultural identity in other societies. However, Papua's unique context offers an exciting new platform for understanding how technology and science interact with local culture and the resource-rich natural environment.

In the face of scientific novelty, research on the impact of technology and science on Papuan society has significant implications. It is hoped that this research will make an important contribution to our understanding of the adaptation of Papuan indigenous peoples to rapid technological and scientific changes. By looking at how modern technology influences daily life patterns, cultural values, and power structures in Papua's indigenous communities, we can gain better insight into the social dynamics of indigenous communities in this region.

The problem of this research is to understand how modern technology and scientific developments affect the society and culture of indigenous Papuan tribes, as well as their implications for identity, power and social values. In this context, the hypothesis proposed is that the adoption of modern technology and the development of science can stimulate changes in culture, social structure and patterns of social interaction in Papuan society.

The aim of this research is to provide a deeper understanding of the impact of technology and science on indigenous Papuan communities, as well as their implications for cultural identity, power and social values. Through this understanding, it is hoped that it can provide valuable insight for the development of more targeted and sustainable policies for the Papuan indigenous people. This research also aims to fill the knowledge gap about the impact of technology and science on the Papuan people, as well as provide a better understanding of how the Papuan people adapt to the changes brought by modern technology and scientific developments. By involving various research methods, including participant observation, in-depth interviews, case studies, and content analysis, it is hoped that this research can make a significant contribution to the fields of anthropology, cultural studies, and other social sciences.

RESEARCH METHODS

In an increasingly connected and rapidly changing era, research that understands the impact of modern technology and scientific developments on society and culture is increasingly important. Papua, with its cultural diversity and unique environment, provides an interesting backdrop for studying how technology and science influence identity, power and values in society. To conduct effective research in this context, the use of appropriate research methods is essential. In this paper, we will explore various research methods that can be used to discuss the impact of technology and science on indigenous Papuan communities.

One of the main methods that can be used in this research is participant observation. Through direct observation of the daily lives of indigenous Papuan people, researchers can understand how modern technology and scientific developments are accepted and used in the local context. By becoming part of the community, researchers can observe direct interactions between indigenous peoples and technology and understand the social and cultural implications.

Apart from observation, in-depth interviews are also an important method for understanding individual perceptions and experiences of technology and science. By conducting interviews with members of the Papuan indigenous community in Jayapura City, Merauke City, and Wamena City, researchers were able to dig deeper into their views on the impact of technology on identity, power, and cultural values. In-depth interviews also allow researchers to capture the nuance and complexity of perspectives.

Case studies are another effective method for understanding the concrete impact of technology and science on indigenous Papuan communities. By choosing the case of internet blackouts in Papua in 2019 and internet blackouts in the South Papua region some time ago, this research aims to look at the Papuan people's response to the importance of a stable and adequate internet network. By examining community responses to several case studies of technology projects implemented in Papua, researchers can analyze their impact on daily life, as well as the implications for cultural identity and power structures. Case study analysis allows researchers to discover general patterns and lessons that can be applied to a broader context.

Apart from using primary data, this research can also rely on content analysis as a method to understand the narrative and understanding of technology and science in Papuan society. By analyzing local media, government publications, and documentation of technology projects, researchers can identify how technology is presented and understood by society and government.

An interdisciplinary approach is very important in this research. By combining knowledge and methodologies from anthropology, technology and science, we can provide a more comprehensive understanding of the impact of modern technology and scientific developments on Papuan society. This approach allows researchers to view phenomena from multiple perspectives, as well as investigate the complex interactions between technology, culture, and society.

In analysing the data collected, researchers can use various analytical methods, including qualitative analysis, narrative analysis, and comparative approaches. By using a combination of these methods, this research can provide an in-depth understanding of the impact of technology and science on Papuan society and culture, as well as its implications for identity, power and values in that society.

Therefore, appropriate research methods are very important in studying the impact of modern technology and scientific developments on Papuan society. Using participant observation, in-depth interviews, case studies, content analysis, and an interdisciplinary approach, this research can provide valuable insights into how technology and science shape and influence the lives of Papuan people.

RESULTS AND DISCUSSION

Health Benefits

Progress in Anthropological Technology and Science globally has had a positive impact on human life universally. One of the most obvious health benefits from advances in Anthropological Technology and Science is in the medical and public health fields [1]. These advances have significant implications for improving human health and well-being. Through research, innovation, and technological applications, this field has made important contributions to understanding and addressing global health challenges [2]. Scientific research conducted within an anthropological framework helps in understanding disease, risk factors, and the complex interactions between humans and their environments [3]. This allows the development of more effective prevention, diagnosis and treatment strategies. For example, through a deep understanding of a community's culture and beliefs, anthropological researchers can design health programs that are more acceptable and effective for local communities. By considering cultural values, social norms, and traditional practices, health interventions can be tailored to local needs and preferences [4].

Additionally, advances in medical technology have been an important milestone in the evolution of disease diagnosis and treatment. The development of increasingly sophisticated medical imaging, innovative laboratory technologies, and ever-expanding drug development have opened the door to more accurate diagnosis and more effective treatment [5]. However, to holistically understand the impact and implications of these advances, it is important to adopt an anthropological approach that looks beyond the technology itself. By using an anthropological perspective, research can explore the social, cultural, and environmental contexts that influence health and disease [6]. This includes understanding how cultural values and social norms influence perceptions of health and illness, how environmental factors such as access to health services influence the use of medical technology, and how social and economic structures influence the accessibility and acceptability of medical care [7].

Thus, an anthropological approach allows us to gain a deeper and more comprehensive understanding of how medical technology interacts with society and culture, and how it influences people's overall experience of health and illness.

For example, let's look at how advances in medical imaging technology, such as MRI (Magnetic Resonance Imaging), impact people's experiences in diagnosing disease [8]. Technically, MRI is a very sophisticated and effective tool in detecting internal health problems, but how society accepts and uses it can be greatly influenced by social and cultural factors. For example, in some Papuan communities, especially those in interior or remote areas, access to health services may be limited. Therefore, even if MRI technology is available, these communities may not be able to fully utilize it due to long distances, high costs, or lack of awareness of its benefits [9]. On the other hand, in communities that are more economically advanced and have access to good healthcare, acceptance of medical imaging technology may be higher [10]. However, cultural norms and traditional beliefs can also influence how people view and use these technologies [11,12]. For example, in some indigenous Papuan cultures, especially those with spiritual beliefs or belief in alternative medicine, the use of modern medical technology such as MRI may be met with skepticism or even rejection. Therefore, to understand how medical technology truly affects society and culture, we need to consider these complex social, cultural, and environmental factors through an anthropological approach.

The Anthropology of Technology and Science also has a very important role in understanding the social determinants of health. This approach not only considers the biological aspects of health, but also analyzes the social, economic and environmental factors that influence the well-being of individuals and society [13]. Thus, anthropological research can open deeper insights into the complex relationship between sociocultural context and health [14]. For example, factors such as socioeconomic status, education, access to health care, and physical environment have a significant impact on a person's health. Through an anthropological approach, researchers can understand how these factors interact and

influence individual and societal experiences of health and illness [15]. In addition, this research can also identify inequalities and gaps in access to health resources and fight for health equality. Thus, anthropological research in this area not only provides a more comprehensive understanding of the social determinants of health but also provides a strong basis for designing policies and interventions oriented towards improving the social and environmental conditions underlying health problems, with the ultimate goal of improving well-being and equal health for all members of society.

For example, this paper conducted anthropological research using participatory methods to investigate public health issues in the densely populated cities of Jayapura and Merauke. Through an anthropological approach, it can investigate various social, economic and environmental factors that influence public health in these areas [16]. This research found that access to affordable and quality health services is one of the main problems faced by indigenous Papuans, especially those from the lower economic strata. Factors such as low income, lack/absence of health insurance, and lack of adequate health infrastructure can hinder a person's ability to get the care they need. Even if they have health insurance such as BPJS, some types of medicine tend not to be covered by this insurance, so people have to buy it themselves.

This study also highlights the role of the physical environment in public health. Densely populated urban areas such as Jayapura and Merauke have limited access to sports facilities or green open spaces, playgrounds, jogging paths, chaotic pedestrian paths, as well as minimal and unintegrated facilities for people with disabilities, which can affect physical activity levels of the population and increases the risk of lifestyle-related diseases such as obesity, heart disease and the risk of other diseases. In addition to economic and environmental factors, anthropological research can also highlight the cultural norms and habits of people that influence their health [17]. For example, unhealthy eating habits and eating patterns can be a risk factor for chronic diseases such as diabetes and hypertension. Some of the indigenous Papuan communities I visited did not have a regular diet, and excessive carbohydrate consumption may have been caused by more physical work. By understanding these factors thoroughly, anthropological research can provide deep insight into the complexity of public health problems. This information can be used to design more effective policies and interventions that are oriented towards improving the social and environmental conditions underlying health problems so that society can achieve a better level of overall health. The application of information and communication technology (ICT) in the health sector is an important contribution to the progress of Technological and Scientific Anthropology [18].

In an increasingly digital era, health information systems, telemedicine, and mobile health applications have become an integral part of efforts to improve health services [19]. Health information systems, for example, enable the storage and exchange of medical data electronically, so that health workers can access patient medical records more easily and efficiently. Telemedicine, on the other hand, enables remote medical consultations via communication technology, thereby allowing a person to receive diagnosis and treatment without having to come to a physical health facility [20]. Meanwhile, mobile health applications, with features such as health tracking, medication reminders, and personalized health information, provide accessibility and convenience in monitoring health conditions and obtaining health education to the wider community.

The information and communication technology not only provides solutions to increase the accessibility of health services but also opens up new opportunities for disease prevention, independent health monitoring, and health promotion in society [21]. The Papua Provincial Government, through the health service, has provided telemedicine services in several areas in Papua, including the Yapen Islands [22]. This activity is important for health services in general. However, this activity is one of the efforts to approach access and quality of service by implementing a telemedicine system, which is expected to be able to meet the demands of health service needs which require speed and accuracy of medical diagnosis as well as fast and quality consultations, especially in areas with high maternal and child mortality rates. which is still high and areas with high stunting rates. With advances in information

technology, the Ministry of Health is building telemedicine in Indonesia which is expected to make it easier for people to get specialist services down to First Level Health Facilities, both at Community Health Centers and Hospitals as service providers.

Thus, the health benefits of advances in Technological and Scientific Anthropology are enormous. From better understanding of the social and cultural factors that influence health, to the development of revolutionary medical technologies, this field has made significant contributions to improving human health and well-being. Therefore, continued investment and support for research and innovation in Technological and Scientific Anthropology is essential to ensure that these health benefits can continue to be felt by communities around the world and more specifically in the indigenous communities of Papua.

Educational Benefits

The Anthropology of Technology and Science has a very significant role in the transformation of modern education to make it more effective, inclusive and relevant. With a deep understanding of humans and society and the appropriate application of technology, this field has opened the door to beneficial educational innovations [23]. One of the main examples is the application of information and communication technology (ICT) in the learning process. By utilizing online platforms, learning applications and other interactive tools, education becomes more accessible to various groups, including those who live in remote areas or have physical limitations [24]. Additionally, anthropological approaches in educational technology also enable more inclusive learning, where individual needs and preferences are considered in curriculum and learning design experience. For example, by understanding students' diverse cultures and backgrounds, educational technology can be adapted to include diverse and culturally relevant content, so that all students feel recognized and valued in the learning process. Additionally, anthropology also provides insight into how cultural values and social norms influence perceptions about education and learning. By considering these aspects, education can be designed to better suit society's needs and expectations, resulting in more meaningful and sustainable outcomes [25]. In this way, Anthropology of Technology and Science serves as an important mediator between technology, science, and education, helping to create a more dynamic, inclusive, and relevant learning environment for everyone.

One of the main benefits of advances in the Anthropology of Technology and Science in education is the use of technology in learning. With the advent of the internet, computers, mobile devices, and online learning platforms, students and teachers have greater access to educational resources. This allows distance learning, use of multimedia, and collaboration between students from different geographical areas [26]. The application of technology also opens the door to more interactive and experience-based learning methods [27]. Simulations, educational games, and learning applications allow students to actively engage in the learning process, increasing their understanding of scientific and cultural concepts. Additionally, technology also facilitates project-based learning, where students can use digital tools and resources to explore topics that are interesting and relevant to them.

Anthropology of Technology and Science also allows for the development of a more inclusive and diverse curriculum. By considering the diversity of cultures, values, and perspectives of societies around the world, educational curricula can be designed to encompass a variety of viewpoints and experiences [28]. This helps foster a deeper understanding of cultural plurality and increases tolerance and appreciation for differences [29]. In addition, advances in the Anthropology of Technology and Science also make a major contribution to the training of teachers and educators. Through professional development programs and innovative educational resources, teachers can improve their skills in teaching and mentoring students. With a better understanding of effective ways to deliver material and facilitate learning, teachers can create inspiring and motivating learning environments. Apart from that, Anthropology of Technology and Science can also help promote science and technology literacy among students [30]. By introducing science and technology concepts holistically, and emphasizing the

importance of critical and analytical thinking, education can help students develop the skills necessary to succeed in an increasingly connected and changing society [31].

Thus, the educational benefits of advances in the Anthropology of Technology and Science are enormous. From the application of technology in learning to the development of inclusive curricula, this field has brought about significant changes in the way we learn and teach. Therefore, continued investment and support in the Anthropology of Technology and Science is essential to ensure that the benefits of this education can continue to be felt by future generations.

Although the Anthropology of Technology and Science is believed to have a positive impact in improving education, there are some views that criticize this approach. Some argue that over-reliance on technology in education can reduce human interaction and obscure important values such as cooperation, caring and diversity [32]. In addition, although technology can expand accessibility to education, there are still big challenges related to the digital divide that prevents some people from accessing this technology easily. Factors such as unequal access, lack of technological skills, and inadequate infrastructure remain major obstacles to the implementation of educational technology in some regions [33]. Apart from that, there are also concerns regarding data privacy and security that arise when using technology in learning, especially in terms of the collection and use of students' personal data. Therefore, although the Anthropology of Technology and Science can make a valuable contribution in improving education, it is important to consider the challenges and potential negative impacts that may arise from the application of such technology wisely and carefully.

Economic Benefits

The Anthropology of Technology and Science has a role in creating a significant impact on the economic aspects of society. Although in the past this field was often considered to be closely related to health sciences and education, its contribution to the economy is increasingly promising. In an era of globalization and rapid technological innovation, advances in this field have opened the door to new opportunities for sustainable and inclusive economic development [34]. One prominent example is the use of technology to support the micro and small economic sectors, which are often the backbone of the economy in many regions [35]. Through e-commerce platforms, such as e-commerce websites and mobile applications, small businesses can expand their market reach and increase the accessibility of their products to local and global consumers [36]. This not only helps increase the income of micro and small entrepreneurs, but also encourages economic inclusion and empowerment of previously marginalized communities.

Moreover, technology has also played an important role in changing the way markets work and structure in various economic sectors, from agriculture to manufacturing and financial services [37]. For example, the use of precision agricultural technology and data analysis applications has increased productivity and efficiency in the agricultural sector, while innovations in manufacturing technology and automation have enabled increased production capacity and product quality in the manufacturing sector [38]. This not only opens up new opportunities for economic growth, but also increases the competitiveness and economic resilience of a region's people in facing global challenges.

Additionally, one of the major economic benefits of advances in the Anthropology of Technology and Science is that technological innovation drives economic growth. Through technology research and development, we have seen the emergence of new products and services that improve efficiency, productivity, and quality of life [39]. For example, information and communications technology has opened the door to new industries such as cloud computing, e-commerce, and social media, all of which have had a major impact on global economic growth. Advances in science and technology also provide opportunities for the development of new industries and economic diversification [40]. By utilizing local knowledge and resources, communities can develop new economic sectors that are sustainable, and knowledge based. For example, by utilizing traditional skills

and local natural resources, communities can develop sustainable tourism industries or the production of unique local goods.

The Anthropology of Technology and Science can also help improve society's access to global markets. Through the use of information and communications technology, people can connect with customers and business partners around the world, opening the door to international trade opportunities and market expansion [41]. This can help expand the local economic base and improve community welfare. Opportunities for communities to access global markets do exist, but the level of participation of indigenous Papuans in global markets is very low.

Advances in anthropology can also contribute to the sustainable management of natural resources and the environment. By understanding the complexity of interactions between humans and the environment, anthropological research can assist in designing policies and practices that encourage sustainable and responsible use of natural resources [42]. This is not only having the potential to generate long-term economic benefits, but also to maintain a healthy and sustainable living environment for future generations. Apart from that, Anthropology of Technology and Science can also help strengthen human skills and capacities [43]. Through education and training in science and technology, people can gain the skills necessary to participate in an increasingly connected and knowledge-based global economy. This can help increase the competitiveness of individuals and society in the global job market.

Thus, the economic benefits of advances in Technological and Scientific Anthropology are enormous. Starting from technological innovation that triggers economic growth to the development of new sustainable industries, this field has brought about significant positive changes in the economic structure of society [44]. Therefore, it is important to continue to support research and innovation in the field of Technological and Scientific Anthropology to ensure that these economic benefits can continue to be felt by communities around the world.

One real example of the economic benefits of advances in Anthropology, Technology and Science can be seen from the opportunities for applying ICT through the development of local craft industries in Papua. In Papua, indigenous Papuans have a cultural heritage of making handicrafts, such as Noken, traditional clothing, loincloths, woven bamboo and rattan, or making traditional cloth and others.

With the adoption of digital technology and online marketing, local craftsmen can expand their market reach beyond local and national areas. In the past, craftsmen could only sell their products in local markets or through local traders at prices that might be low due to limitations request.

However, with the use of e-commerce platforms and social media, they can now showcase their works to a wider audience, including international tourists and fans of traditional art from all over the world. This not only increases the income of craftsmen, but also increases added value for cultural owners as a whole by strengthening the local economy and promoting the unique cultural heritage of the entire Land of Papua that the world tends to forget. Additionally, with the adoption of modern technologies such as automated Nokken looms or digital inventory management systems, production efficiency can also be improved, which in turn increases productivity and product quality. This can lead to increasing the competitiveness of local products in the global market and opening up greater export opportunities, which ultimately contributes to sustainable economic growth for society [45].

By continuing to support research and innovation in the field of Anthropology, Technology and Science, such as the development of technology that suits local needs and contexts, economic benefits like this can be expanded and strengthened in communities throughout the Land of Papua and can even reach the world [46]. This shows how important investment in this area is to support inclusive and sustainable economic growth, while strengthening and preserving the cultural heritage and traditions of local communities [47].

Political Benefits

Anthropology of Technology and Science is not only about understanding health, education, and economics, but also has a significant impact in the political realm. Through the application of technology and deep scientific understanding of humans and society, this field has opened up new opportunities for more inclusive political participation, more effective decision making, and the empowerment of society as a whole [48].

One of the main political benefits of advances in the Anthropology of Technology and Science is that it facilitates broader and more inclusive political participation. By using information and communications technology, citizens can connect with political leaders, participate in decision-making processes, and express their views on political issues [49]. For example, social media allows citizens to discuss and share information about political policies and issues, thereby enabling them to play an active role in the political process. Advances in the Anthropology of Technology and Science can also help increase transparency and accountability in government. Through the use of information and communication technology, data and information about government activities can be accessed more easily by the public. This helps reduce opportunities for corruption and abuse of power and gives citizens greater control over their government's actions.

Anthropology of Technology and Science can also help in designing more effective and evidence-based public policies. By leveraging scientific knowledge and methodology, policies can be designed to address complex social and economic problems in a more targeted and efficient manner [50]. For example, using scientific data and analysis, governments can decide, legislate and design public health programs that are more effective in addressing infectious diseases or reducing health inequalities through political decisions. In addition, Anthropology of Technology and Science can also play an important role in facilitating intercultural dialogue and international cooperation. By understanding different cultural and social perspectives, societies can build better relationships with other countries and work together to overcome global challenges such as climate change, natural disasters, and infectious diseases.

Advances in Technological and Scientific Anthropology can also help empower society as a whole. By facilitating people's access to information, education, and resources, technology can help increase people's capacity to participate in the political process and advocate for their own interests [51]. This helps create a more democratic, inclusive and empowered society.

Thus, the political benefits of advances in the Anthropology of Technology and Science are enormous. From more inclusive political participation to more effective policymaking, this field has opened up new opportunities to improve the political process and empower society as a whole. Therefore, it is important to continue to support research and innovation in the Anthropology of Technology and Science to ensure that these political benefits can continue to be felt by society.

Although the Anthropology of Technology and Science is considered to have a significant impact in the political realm, there are some views that question the extent of this field's contribution in creating more inclusive political participation and more effective decision making. Some critics argue that too much reliance on technology in politics can obscure the essence of political participation which should be based on dialogue, direct interaction and social experience [52]. Additionally, there are concerns that the dominance of technology in the political process could strengthen inequalities in access to and control of information, which in turn could affect the integrity and transparency of political decision-making. For example, social media platforms are often a means of spreading inaccurate or even disinformation, which can influence public opinion and lead to the formation of unhealthy or radical political views.

Additionally, when it comes to elections, there are concerns about the security of electronic voting systems and the potential risk of cyberattacks or data manipulation [53]. This suggests that

although the Anthropology of Technology and Science can make a positive contribution to politics, it is important to consider the challenges and risks associated with the judicious use of technology in political contexts, as well as ensuring that inclusive political participation and effective decision-making remain based on values. the values of democracy, accountability and justice.

Social and Cultural Benefits

The Anthropology of Technology and Science not only influences the economic and political aspects of society, but also has a significant impact in the social and cultural domains. Through a deep understanding of humans and society, as well as innovative applications of technology, this field has brought great benefits in improving relationships between individuals, strengthening cultural identity, and promoting social equality [54].

One of the social benefits of advances in the Anthropology of Technology and Science is in expanding access to education and information. Through information and communication technology, society has greater access to educational resources, such as digital textbooks, online courses, and interactive learning platforms [55]. This helps increase the accessibility of education for individuals from various social and economic backgrounds and promotes inclusivity in learning.

In addition, advances in the fields of Technological and Scientific Anthropology also enable broader and more diverse cultural exchanges. By utilizing communications technology, individuals can interact with people from different cultures and backgrounds, enriching their experiences and broadening their insight into the world [56]. This helps strengthen cultural diversity and promote intercultural tolerance in an increasingly connected society.

Technological and Scientific Anthropology also plays an important role in strengthening cultural identity and recognizing cultural rights. Through anthropological research, local culture can be studied, understood and appreciated, thereby helping to strengthen people's sense of pride and attachment to their cultural heritage. In addition, technology can also be used to preserve and promote local culture through digital platforms, such as websites and online archives.

Additionally, advances in the Anthropology of Technology and Science can also help address social inequality and marginalization. Through evidence-based research, society can identify and understand the root causes of social inequality, and design strategies to overcome them. Technology can also be used as a tool to mobilize people and fight for their rights, thereby helping to change the unequal power dynamics in society. Apart from that, advances in technological and scientific anthropology also bring benefits in improving the quality of life of society as a whole. Through technological innovations in health, the environment, and everyday life, we have seen improvements in individual health, comfort, and safety. This helps create a more prosperous and socially and culturally sustainable society.

Thus, the social and cultural benefits of advances in Technological and Scientific Anthropology are enormous. From expanding access to education and information to strengthening cultural identity and overcoming social inequality, this field has brought about significant changes in human social and cultural life. Therefore, it is important to continue to support research and innovation in the field of Technological and Scientific Anthropology to ensure that these social and cultural benefits can continue to be felt by society.

Case Study: Community Response to Internet Blackout in Papua

In the era of globalization filled with increasingly sophisticated information and communication technology, the internet has become an important element in the daily lives of people throughout the world, including in Papua, Indonesia. Papua, with its rich culture and unique environment, experienced a significant impact from the internet blackout in 2019 when there were cases of racism against Papuans in Surabaya by members of the public [57]. The government admitted that they deliberately controlled the flow of information, which according to the government, the spread of hoaxes was more massive at that time [58].

So, the decision taken was to turn off internet access with various considerations. Internet network outages also occurred in the South Papua Province region, which according to reports occurred due to non-human factors, namely sharks biting underwater cables [59]. These two cases are interesting to study in this research to analyze the general response of the Papuan people to what extent the Papuan people are dependent on internet access. The findings in this research show that the utilization of internet network access in Papua is generally quite high. However, if categorized into the use of internet access for health, education and economic purposes, the numbers are still small.

It must be acknowledged that the internet has become a vital tool for the Papuan people in accessing information, doing business, communicating and getting education. However, when the internet goes down, Papuan people face serious challenges in carrying out their daily activities. The impact is very broad and varied, affecting various aspects of people's lives. In the economic sector, many small and medium businesses in Papua rely on the internet to run their business. With the internet cut off, these businesses experienced a significant decline in income and were even threatened with bankruptcy. Apart from that, the internet is also an important tool in the world of education in Papua. Many students and students rely on the internet to study, conduct research, and complete assignments. With the loss of internet access, they face difficulties in obtaining learning materials and other educational resources.

People's responses to internet blackouts in Papua vary, depending on their social, economic and cultural backgrounds. Most people may experience frustration and distress due to losing access to the internet. They may face difficulties running a business, communicating with family and friends, and getting the information they need. However, others may have alternative strategies for staying connected to the outside world, such as using expensive satellite networks where available or relying on direct communications.

In addition to economic and social impacts, internet blackouts also have deep cultural and identity implications. The internet has become an important channel for Papuans to share their culture with the outside world and gain access to information and other cultural resources. With the loss of internet access, there is a risk of cutting off the exchange of local culture and identity with the outside world [60]. This can influence the way Papuans understand themselves and their place in the global context.

To avoid internet blackouts in Papua, there needs to be a collaborative effort between the government, internet service providers, security forces and the community. The government can prioritize telecommunications infrastructure in Papua to ensure the availability of reliable and affordable internet in the region. Meanwhile, internet service providers can develop alternative solutions, such as wider cellular service or providing internet access via satellite, although these are expensive. Security forces oversee the development of local and online infrastructure. Apart from that, the community can also be involved in developing and maintaining local telecommunications infrastructure, so as to increase the sustainability of internet access in the area.

Thus, the internet blackout in Papua has a broad and serious impact on society, both socially, economically and culturally. Community responses to this situation have varied, but it is important for

governments and other stakeholders to work together to find sustainable solutions. Through this collaboration, it is hoped that reliable and affordable internet access can be provided to the community, so that the Papuan people can continue to be connected to the outside world and make maximum use of the potential of information and communication technology.

CONCLUSION

The Anthropology of Technology and Science has an important and multidimensional role in shaping and influencing various aspects of human life, including health, education, economics and politics. Through the application of technology and deep scientific understanding of humans and society, this field has brought about significant positive changes in the structure and dynamics of society. In the health context, the Anthropology of Technology and Science has facilitated a better understanding of the social determinants of health and enabled the development of more effective interventions. In the field of education, the contribution of this field has increased the accessibility, inclusivity and relevance of learning. Economically, the Anthropology of Technology and Science has opened up new opportunities for sustainable and inclusive economic growth through technological innovation. And in politics, this field has created more inclusive political participation and more effective decision making through the application of technology and data analysis. However, it needs to be acknowledged that there are still challenges and risks associated with the use of technology in social and cultural contexts.

In addition to exploiting the positive potential of Technological and Scientific Anthropology, it is also important to carefully consider the social, ethical and justice implications of these technological innovations. Therefore, this conclusion emphasizes the importance of continuing to support research and innovation in Technological and Scientific Anthropology to ensure that its benefits can be widely experienced by people around the world, while wisely managing the risks that may arise.

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