

INFORMATION TECHNOLOGY UTILITY ON COMPANY PERFORMANCE IN THE INDUSTRIAL REVOLUTION ERA 4.0: CASE STUDY AT GERAI DINAR PEKALONGAN

AM. Muh. Khafidz Ma'shum 

State Islamic Institute of Pekalongan, Indonesia

R Nia Marotina 

State Islamic Institute of Pekalongan, Indonesia

Nur Hidayah 

State Islamic Institute of Pekalongan, Indonesia

Abstract

The revolution of Islamic financial institutions in terms of technology has now become a necessity. Similar to conventional financial institutions or other companies, Islamic financial institutions also need to take advantage of technological advances to be able to compete with other financial institutions. This study aims to find out how financial institutions take advantage of advances in information technology in the company's operations, the impact obtained and the policies taken by the company in responding to advances in technology and information. The method used in this research is a field study with a qualitative descriptive approach with data collection through structured interviews and documentation methods as supporting data in the study. The results showed that the use of information technology at Gerai Dinar Pekalongan was not as maximal as other Islamic Financial Institutions, but still provided convenience for employees in carrying out promotions, daily price updates, and financial reporting in each period. As for consumers or customers, they can find out daily price updates through social media and Gerai Dinar Pekalongan website and can also make purchase transactions through Gerai Dinar Pekalongan website. In addition, there is an increase in the Captive Market, which was originally people who were old and usually old entrepreneurs or civil servants and retirees, now with the existence of information technology coupled with the target of productive young people.

Keywords: Information Technology, Company Performance, Industrial Revolution 4.0

Introduction

The development of digital and internet is a sign that the world has experienced the 4th industrial revolution, after the automation technology that occurred in the 3.0 industrial revolution. The industrial revolution 4.0 is an era where science and technology is developing rapidly so that it changes the lifestyle and behavior of people in all corners of the world, including in Indonesia. This era is able to present various kinds of technological developments that aim to facilitate all activities (Mumtaha & Khoiri, 2019). The impact of the industrial revolution has penetrated all aspects of human life such as the economic, political, social, and cultural fields.

As a result of the development of technology and information requires innovation in all aspects of life without exception. Of course, the innovations carried out must be based on accurate considerations, not only focusing on the technology used, but also the benefits and possible obstacles or threats that will arise from the innovations carried out. Therefore, good management is needed in the face of the current industrial revolution.

The ease of doing work as a result of the development of technology and information has now been felt by the community. It's not just jobs that are starting to be helped because of the emergence of high-tech machines, but the process of exchanging information can run easily and quickly. The rapid use of information technology has a positive impact on economic growth in Indonesia (Sundari, 2019). This condition occurs because economic actors have been able to digitize the operations of the companies or institutions they have, so the work of employees will be lighter.

Technological developments in the 4.0 revolution era are thought to be able to make a major contribution to the country's economy, but on the other hand the country is also under threat arising from these technological advances (Faqih, 2019). The industrial revolution has taken on the role of human labor in work, so HR (Human Resources) must be able to adapt to changes that occur (Faqih, 2019). The increasing number of unemployed due to the quality of human resources who are not able to keep up with technological developments is one of the consequences of the shift of human work to machine technology.

The convenience that occurs in human life, especially in the field of information, has resulted in the birth of a young generation with superior competencies who are ready to coexist with technological advances. It is the superior generation that will later lead to fierce competition in life. The aspect of life that can be felt the most changes after the industrial revolution is the economic field. Digital-based economic actors are starting to emerge, offering easy products and services to become the main factor to rely on in an effort to compete with other economic actors.

In financial institutions, for example, management is competing to apply technology to all operational aspects to make it more attractive to the public and to be able to increase the income of the institution or company. The form of application of technology and information in financial institutions can be divided into several parts, for example in the promotion section starting from making graphic designs, to dissemination on social media. Then in the field of services that can be done online without having to come directly to the office of the financial institution, then in the internal section which is able to facilitate the process of making reports in each period. Ease of course it will feel more effective and efficient.

The advantage of implementing effective and efficient operations will have an impact on the company's performance, not only on easier work to do but also the time required will be faster, so the company will be more productive than before. Internal parties will easily find out how the condition of the company will then affect the policies that will be set in the future.

The revolution of Islamic financial institutions in terms of technology has now become a necessity (Nurzianti, 2021). Similar to conventional financial institutions or other companies, Islamic financial institutions also need to take advantage of technological advances to be able to compete with other financial institutions. The use of this technology must also be guided by the provisions that apply in Islamic economics.

Literature review

Industrial Revolution 4.0

The industrial revolution occurred 4 times, so that the term industrial revolution 4.0 appeared which initially started in 1784 in England, then developed again at the end of the 19th century, then came computer technology as a sign of the third revolution in 1970 and is now in its infancy. in the era of the fourth industrial revolution. Revolution is simply defined as change. Changes in the revolution involve several forces as stated by Soekarno (Putra, 2018) namely changes that are fundamental or fundamental, radical changes, comprehensive changes, changes that take place at a fast time, changes that intersect with people's lives, changes that are only made by certain parties, as well as changes that collide with other changes. The change into the digitalization era brings quite a lot of influence on human life (Amalia, 2021). There are 5 reasons why the industrial revolution is considered important (Irwansyah, 2018) :

1. Able to minimize the burden of business challenges in the current era
2. There is a process of accelerating innovation in the business model
3. Because it places the consumer at the center of all activities, it requires skills for the workforce to manage work more flexibly
4. Industry 4.0 makes it possible to increase prosperity due to technological advances so as to ease work.
5. Technological advances due to the industrial revolution 4.0 are able to provide useful data and services for future production decisions.

The industrial revolution has 4 principles (Nurzianti, 2021) including:

1. Transparent information, in the form of data analysis and provision of information
2. Independent decisions

3. Technical assistance that facilitates work, in the form of physical and virtual assistance, and
 4. The existence of conformity with the needs, namely with collaboration, security, and standards.
- The challenges that are often experienced in the era of the industrial revolution 4.0 (Hamdan, 2018)

:

1. Problems that occur in the security of the information technology used
2. Problems on the stability of the machine for production
3. Incompetent quality of human resources
4. There is a lot of unemployment due to human labor being replaced by machines.

Information Technology

Information technology is a technology created by humans that combines computers with high-speed communication channels for the process of delivering information in the form of data, voice and video so that its distribution is faster, wider and can be stored for a long time (Marhaen & Jaenab, 2021). Information technology is a technology that is useful for storing, processing, producing, and sharing information (Putra, 2018). The presence of information technology has an influence on people's lives, because it is able to provide convenience for everyone in the communication process, both receiving and disseminating information. Haag dkk (2000) divide information technology into several parts (Putra, 2018) namely: input technology, output technology, hardware technology, storage technology, communication technology and processing machines

The purpose of implementing information technology in companies (Yuliana, 2000) :

1. To attract interest from consumers by promoting on social media
2. Improve and simplify service to consumers
3. Marketing of products that have been produced through the website
4. Facilitate the process of introducing new products through social media.

The advantages that can be obtained after applying information technology (Endraswari, 2006):

1. Global Dissemination, which means that all communication in business is done through the web so that information dissemination can occur effectively and efficiently.
2. Interactive communication, communication that occurs with consumers occurs online and a fast response will be able to establish good relationships with consumers
3. Automation, related to information services to consumers, services tailored to what is needed by consumers/customers
4. Collaboration, able to improve cooperative relationships between fellow business partners
5. Electronic commerce, between sellers and buyers connected via the internet, ranging from forms of marketing to service.
6. Integration, the internet is used as a unifying forum between business people from different places, making it easier to obtain information.

Company performance

Performance is a condition that must be confirmed by certain parties to be able to find out how the achievement of an institution or company in completing work in accordance with the vision and policies set (Zamzami & Zuhri, 2015). Performance is the result of real achievement in a certain period both individually and in groups (Nurjaya et al., 2021). Performance appraisal is closely related to the completion or failure of a task, the success or failure of employees in carrying out the work.

In Darma (2013) there are several elements contained in performance management, including: the preparation of an agreed framework between managers and employees, the process of a series of performance, an understanding of mistakes by making performance improvements, and the last is an approach where this is one of the efforts made to develop existing human resources (Zamzami & Zuhri, 2015).

The use of information technology (internet) has an effect on 3 dimensions of company performance (Endraswari, 2006). These dimensions are:

1. Coordination, cooperation between producers and suppliers related to the production sector
2. Efficiency, this dimension refers to productivity in a company
3. Trade, with advances in information technology, companies are able to expand their products/trade with easier services.

Research methods

The approach used in this study is a qualitative approach with a descriptive method. Data collection techniques that researchers use are interview and documentation techniques. The questions addressed to the interviewees have been prepared beforehand so that the interview process can be more structured and no data is missed. The interview process was carried out at Gerai Dinar Pekalongan, located at Jalan Argopuro No. 26 Podosugih, Kec. West Pekalongan, Pekalongan City, Central Java with Manager from the financial institution as the resource person.

The data in this study are divided into two, namely primary data obtained directly from the financial institution in the form of interviews, and secondary data taken from the social media of financial institutions that are used as supporters in this study.

Results and discussion

Based on the research that has been done by the researcher, the researcher can describe the results of this study in the attached description below. The use of information technology in this study showed results that were felt to be less than optimal in their use when compared to the development of the industrial revolution 4.0.

This research was conducted at Gerai Dinar Pekalongan, located at Jalan Argopuro No. 26 Podosugih, Kec. West Pekalongan, Pekalongan City, Central Java. The Pekalongan Dinar Outlet is a gold-based Islamic financial institution that has been established since October 1, 2010. The products offered by the Dinar Outlet are 3, namely Antam Gold, Dinar Coin and Dirham Coin. In addition, the Gerai Dinar Pekalongan also provides savings services for gold savings and leads to the introduction of gold savings to the general public so that they are interested in investing in gold.

Overview of Information Technology at Gerai Pekalongan Dinar

Technology and information are important aspects that must be owned by institutions or companies because they are useful in the process of achieving company goals (Putri & Srinadi, 2020). The information system or technology used at Gerai Pekalongan Dinar is considered relatively still less than the maximum when compared to the leading Islamic Financial Institutions. Both in terms of content or software that has been used. This is also evidenced by a statement from the manager of Gerai Dinar Pekalongan:

"Yes, if you say you have used an information system or not, yes, here it is, but it is not as sophisticated as a good Islamic Financial Institution. So here is still semi-manual. Most just for internal section and even if for the public there is only a website and social media."

(Gerai Pekalongan Dinar Manager, 7 October 2021)

The manager also mentioned that there are two types of information technology that can be accessed by customers and the public, namely: Website: <https://geraidinarpekalongan.com/> and Instagram: [geraidinarpekalongan](#).

The use of information technology in a company is expected to have a positive impact on the sustainability of the company, both for internal and external parties. This will be able to increase the competitiveness of institutions or companies so that they are not left behind or even excluded from the rush of competition. However, the application of the technology must be adjusted to the capabilities of existing human resources.

Human Resources Involved in Information Technology at Gerai Dinar Pekalongan

Advances in technology and information will have a good impact on all aspects of people's lives if they are in the right hands. This means that the progress of science and technology must coincide with the increase in the quality of human resources. The human resources involved in information technology at the Gerai Dinar Pekalongan are internal parties of the Gerai Dinar Pekalongan itself. Both from the service and the manufacture of the information technology. Customers and the general public can also use information technology at the Gerai Dinar Pekalongan in the form of websites and social media. This is also evidenced by a statement from the manager of the Gerai Dinar Pekalongan:

"The information technology that we have here we make our own, especially in the IT department. For information technology in the form of accounting and bookkeeping, internal parties are running. Customers can only view the website and social media."

(Gerai Dinar Pekalongan Manager, October 7, 2021).

Administrative digitization is understood as a digital change in correspondence services designed to react to incoming or outgoing information and make it easier for human resources to complete tasks (Hendriarto, 2021). Matutina said that the quality of human resources (employees) must be guided by 3 things, namely knowledge, skills, and abilities (Hilda & Elly, 2019). There are at least these 3 things in determining or assessing the quality of human resources. Likewise, in a company, organization, or institution, the selection of competent resources must really be considered because later they will be the ones who will run the company's operations.

The Mechanism of Making Information Technology at Gerai Dinar Pekalongan

Creating an application to facilitate the work of employees is one form of utilizing advances in technology and information in a company or institution. The party who creates a program must have a good ability to avoid mistakes in decision making. The manufacture of Information Technology at the Gerai Dinar Peaklongan took into account a SWOT analysis, although it was not exactly in line with the theory and followed the existing SOPs at the time. But over time, SOPs and the development of Information Technology go hand in hand. This is also evidenced by a statement from the manager of the Gerai Dinar Pekalongan:

"Yes, definitely consider yes, but don't get hung up on SWOT analysis like in theory."

"Yes, according to the SOP. But now SOP and information technology go hand in hand. So if there is a new product or mechanism, the SOP will also follow."

(Gerai Dinar Pekalongan Manager, October 7, 2021).

The use of SWOT analysis (Strengths, Weaknesses, and Opportunities) in the planning of a company is not a new thing. This analysis has an important role in the course of a business or business which is now increasingly competitive (Apriandes et al., 2013). The ability to analyze where the strength of the company is so that it can become a supporting factor for the development of a business, being able to find out the weaknesses of the company or business so that it needs to be closed with existing opportunities, and being able to see threats that may occur in the future are the main things that must be owned by someone in running a business or enterprise. Thus, the obstacles that may occur will be able to be overcome properly and minimize the possibility of harm to the company.

Efficient Use of Information Technology at Gerai Dinar Pekalongan

The industrial revolution 4.0 brought changes in the world of business or business, especially in terms of company operations. Information Technology at Gerai Dinar Pekalongan is considered quite helpful in terms of accounting, bookkeeping, for the company's internal division which was originally still using the manual system so that now it can be faster in terms of data collection as well as better financial accuracy. For things such as disseminating information about the movement of gold prices, to purchasing transactions for products from Gerai Pekalongan Dinar, which was originally a manual system, now it can be done online which can be seen on each customer's smartphone. This is also evidenced by a statement from the manager of Gerai Dinar Pekalongan:

"Very efficient, what used to be manual is now by system, everything is so much better in terms of internal. For customers, it's also good, gold price movements can be updated directly from the center if there are changes and if you want to buy gold or dinars or dirhams now you can also go through the website. So the website also has a marketplace"

(Gerai Pekalongan Dinar Manager, October 7, 2021)

Use of digital technologies should be customized to allow a stronger impact on entrepreneurial intention and to deepen relations with the entrepreneurial ecosystem. Learning styles and teaching strategies need to evolve and to move to a more problem-(re)solving style and critical thinking (Ben Youssef et al., 2021). "Easy, fast, and safe" is a term that is already familiar to the ears, this term is often used by marketing parties in offering products to attract more public attention. This is an advantage for both parties as a result of advances in technology and information. Effective and efficient have been felt by both. Efficiency is described as a measure to compare the planned input with the input actually used, while effectiveness refers more to how the target can be achieved with the number of existing inputs (Indrayani, 2012). In the company, of course, these two aspects will be felt because they can ease the

work of employees, besides being able to reduce the energy expended, technological advances are also able to reduce the time needed in the company's operational processes.

The Effect of Information Technology on Human Resources

The reduced workload on employees is a consideration for a manager in managing workforce, with reduced time spent in each work segment, a reduction in the number of workers may occur in a company that has used technology in its business. The use of Information Technology at Gerai Dinar Pekalongan does not result in a reduction in Human Resources. Like Frontliners and marketing are still running as they should. The presence of Information Technology does not hinder employee performance but instead encourages employee performance to be more structured and accurate. This is also evidenced by a statement from the manager of Gerai Dinar Pekalongan:

"No reduction of employees, still the same."

"Thank God everyone can use it and make them perform better."

(Gerai Dinar Pekalongan Manager, October 7, 2021)

Risks Before and After Information Technology

Risk is one component in the business world, it can never be separated. Even after the development of technology and information, old risks will be replaced with new risks caused by information technology itself. Before the existence of information technology, the risk that emerged was the need for word of mouth information about everything that was at Gerai Dinar Pekalongan, accounting accuracy still needed to be questioned, all of which and people who wanted to buy products or open a savings book had to come to the office.

After the existence of information technology, information on all matters concerning Gerai Dinar Pekalongan can be viewed through the website and social media, product purchases and opening a savings book can also be done online, but the existence of information technology also poses a new risk, namely server errors, which can occur at any time. and anywhere.

This is also evidenced by a statement from the manager of Gerai Dinar Pekalongan:

"Yes, the risk has been reduced. Initially, the accounting calculations could have been wrong. At first, when a customer wanted to buy a product, he had to come here, now he can just go to the website, and in the past, if he wanted to open a savings book, he had to come to the office, now it can be done through social media orders. they fill out the form via the message, then when the customer has time, they can just come to the office and just sign."

"Yes, there must be, usually a server error, that's what happened several times."

(Gerai Dinar Pekalongan Manager, October 7, 2021)

Facing the risks arising from technology is not easy, so internal parties must have more capabilities in this regard. Although not all risks can be predicted, at least the company is able to implement risk management to minimize the negative impacts that will occur (Kurniati et al., 2020).

Changes in Segmenting Targeting Positioning and Captive Market with Information Technology

Setting a strategy in running a business is a must, because without a strategy, business people will experience difficulties if in the future they experience obstacles or the emergence of new competitors. The application of information technology does not change STP but instead adds to it, where initially the targets were adults and usually old entrepreneurs or civil servants and retirees, now with the existence of information technology, the target is young, productive people. Which in the sense does not require what type of work, but really young people who are productive and have income. This is also evidenced by a statement from the manager of Gerai Dinar Pekalongan:

"It's not changing, but it's increasing. In the past, people who were adults who worked as civil servants, retired or old entrepreneurs, now have penetrated into productive young people who basically have jobs and incomes."

(Gerai Dinar Pekalongan Manager, October 7, 2021)

The presence of social media is able to expand marketing targets for business people, who were previously only able to make transactions in one city, now even to other countries can be done easily because of technological advances.

Hilda & Elly (2019) say that a person or group of people in general will use futuristic considerations in the decision-making process. This means that everyone has forward thinking in determining something, adapted to existing needs and conditions. In relation to the captive market, the emergence of similar business competitors for business people will not be a significant problem if internal parties are able to provide new innovations to products and have analytical skills that each customer has different product criteria.

Conclusion

Based on the research conducted, the conclusions are as follows:

1. The Information Technology used by Gerai Dinar Pekalongan is still not optimal when compared to other leading Islamic Financial Institutions
2. Provide convenience for employees in carrying out promotions, daily price updates, and financial reporting in each period.
3. Consumers or customers can find out daily price updates through social media and Gerai Dinar Pekalongan website and can also make purchase transactions through Gerai Dinar Pekalongan website.
4. The information technology used does not hinder employee performance but instead encourages employee performance to be more structured and accurate.
5. There is an increase in the Captive Market, which initially targeted people who are old and usually old entrepreneurs or civil servants and retirees, now with the existence of information technology, the target is young people who are productive.

References

- Amalia, A. (2021). Sejarah Revolusi Industri dari 1.0 sampai 4.0. *JURNAL ILMIAH SUMBER DAYA MANUSIA Tema : SDM Dalam Menghadapi Revolusi Indust Ri Arham Lat If*, 1(January), 2–3. <https://doi.org/10.13140/RG.2.2.20215.24488>
- Apriandes, E., Ranius, A. Y., & Syakti, F. (2013). Analisis Swot Guna Penyusunan Rencana Induk E-Government Pada Pemerintahan Daerah Kabupaten Muara Enim. *Jurnal Ilmiah Teknik Informatika Ilmu Komputer*, 17(2), 1–11.
- Ben Youssef, A., Boubaker, S., Dedaj, B., & Carabregu-Vokshi, M. (2021). Digitalization Of The Economy and Entrepreneurship Intention. *Technological Forecasting and Social Change*, 164(January 2018), 120043. <https://doi.org/10.1016/j.techfore.2020.120043>
- Endraswari, R. M. (2006). *faktor-Faktor yang Mempengaruhi Aplikasi Teknologi Informasi dan Pengaruhnya Terhadap Kinerja Perusahaan*.
- Faqih, W. A. (2019). *Strategi Pengembangan SDM dalam Persaingan Bisnis Industri Kreatif di Era Digital*. 13.
- Hamdan. (2018). Industri 4.0: Pengaruh Revolusi Industri Pada Kewirausahaan Demi Kemandirian Ekonomi. *Jurnal Nusantara Aplikasi Manajemen Bisnis*, 3(2), 1. <https://doi.org/10.29407/nusamba.v3i2.12142>
- Hendriarto, P. (2021). Understanding Of The Role Of Digitalization To Business Model and Innovation: Economics and Business Review Studies. *Linguistics and Culture Review*, 5(July), 160–173. <https://doi.org/10.37028/lingcure.v5nS1.1347>
- Hilda, A. M., & Elly, M. J. (2019). Peningkatan Kualitas Sumber Daya Manusia untuk Pengembangan Sistem Informasi Geospasial. *Jurnal SOLMA*, 8(2), 258. <https://doi.org/10.29405/solma.v8i1.3126>
- Indrayani, H. (2012). Penerapan Teknologi Informasi Dalam Peningkatan Efektivitas, Efisiensi Dan Produktivitas Perusahaan. *Jurnal EL-RIYASAH*, 3(1), 48. <https://doi.org/10.24014/jel.v3i1.664>
- Irwansyah, M. &. (2018). *Transformasi dan Kontribusi Industri 4.0 pada Stratejik Kehumasan*. 7(1), 27–36.
- Kurniati, A., Nugroho, L. E., & Rizal, M. N. (2020). ... Informasi pada e-Government: Ulasan Literatur Sistematis Information Technology Risk Management on e-Government: Systematic Literature Review. *Jurnal IPTEK-KOM (Jurnal Ilmu ..., 22(2)*, 207–222.
- Marhaen, & Jaenab. (2021). Pengaruh Teknologi Informasi Terhadap Pengembangan Potensi Dan Kinerja Pegawai Di BPMDES Kabupaten Bima. *Jesya (Jurnal Ekonomi & Ekonomi Syariah)*, 4(2), 886–895. <https://doi.org/10.36778/jesya.v4i2.466>
- Mumtaha, H. A., & Khoiri, H. A. (2019). Analisis Dampak Perkembangan Revolusi Industri 4.0 dan Society 5.0 Pada Perilaku Masyarakat Ekonomi (E-Commerce). *JURNAL PILAR TEKNOLOGI : Jurnal Ilmiah Ilmu Teknik*, 4(2), 55–60. <https://doi.org/10.33319/piltek.v4i2.39>
- Nurjaya, N., Affandi, A., Ilham, D., Jasmani, J., & Sunarsi, D. (2021). Pengaruh Kompetensi Sumber Daya Manusia Dan Kemampuan Pemanfaatan Teknologi Terhadap Kinerja Aparatur Desa Pada Kantor Kepala Desa Di Kabupaten Gunungkidul, Yogyakarta. *JENIUS (Jurnal Ilmiah Manajemen Sumber Daya Manusia)*, 4(3), 332. <https://doi.org/10.32493/jjsdm.v4i3.10460>

- Nurzianti, R. (2021). Revolusi Lembaga Keuangan Syariah Dalam Teknologi Dan Kolaborasi Fintech. *Jurnal Inovasi Penelitian*, 2(1), 37.
- Putra, P. (2018). Peluang Pengembangan Perpustakaan Berbasis. *Revolusi Industri 4.0: Peluang Pengembangan Perpustakaan Berbasis Teknologi Informasi*, 25(3), 35–41.
- Putri, N. M. K. D., & Srinadi, N. L. P. (2020). Pengaruh Kecanggihan Teknologi Informasi dan Kemampuan Teknik Personal terhadap Eektivitas Penggunaan SIA. *Journal Widya Akuntansi Dan Keuangan*, 1–15.
- Sundari, C. (2019). Revolusi Industri 4.0 Merupakan Peluang Dan Tantangan Bisnis Bagi Generasi Milenial Di Indonesia. *Prosiding SEMINAR NASIONAL DAN CALL FOR PAPERS, Fintech dan E-Commerce untuk Mendorong Pertumbuhan UMKM dan Industri Kreatif*, 555–563.
- Yuliana, O. Y. (2000). Penggunaan Teknologi Internet Dalam Bisnis. *Jurnal Akuntansi Dan Keuangan*, 2(1), 36–52. <https://doi.org/10.9744/jak.2.1.pp.36-52>
- Zamzami, R. M., & Zuhri, S. (2015). Faktor-Faktor yang Mempengaruhi Kinerja Lembaga Keuangan Mikro Syari'ah dengan Menggunakan Metode Indonesia Zakat Development Report (IZDR). *Muqtasid: Jurnal Ekonomi Dan Perbankan Syariah*, 6(2), 1. <https://doi.org/10.18326/muqtasid.v6i2.1-21>