

THE INFLUENCE OF MACHINE ETHICS ON THE PERFORMANCE OF ARTIFICIAL INTELLIGENCE OF THE ASEAN COUNTRIES

Kittisak Jermsittiparsert^{1,2,3*}

Abstract

This aim of the current article is to analyze the influence of the machine ethics such as machine morality, computational morality, computational ethics, smart and safe mobility, digital innovation personalized and remote healthcare on the performance of artificial intelligence (AI) of the ASEAN countries. Data were gathered from the AI databases and World Bank Databases and STATA was employed for the logistic model and other analysis of the article. The finding revealed that all the machines ethics such as machine morality, computational morality, computational ethics, smart and safe mobility, digital innovation personalized, and remote healthcare have positive nexus with the performance of AI in the ASEAN countries. These findings make the policy makers more attentive regarding the ethics of the machine that enhance the performance of AI in the business.

Keywords: Artificial Intelligence, Machine Ethics, ASEAN, Firm Performance

Professor Dr.

¹ *Institute of Research and Development, Duy Tan University, Da Nang 550000, Vietnam*

² *Faculty of Humanities and Social Sciences, Duy Tan University, Da Nang 550000, Vietnam*

³ *MBA School, Henan University of Economics and Law, Henan 450046, China*

* *E-mail: kittisakjermstiparsert@duytan.edu.vn*

Received: 06/09/63 ; Revised: 02/11/63 ; Accepted: 02/12/63

Introduction

The most recent era has realized a blast of novel of new subfields of software engineering worried about advancement of morals in machines. Machine morals, personal computer morals, robot morals, machine ethics, morals of the cyborg, basic morals of the calculations, basic ethics of the robots, basic rights of the robots, and counterfeit ethics are only a portion of the proposition intended to address society's interests with wellbeing of perpetually propelled machineries. Lamentably investigation perceived bounty in canny apparatus wellbeing is deluding (Geis et al., 2019). The extraordinary greater part of distributed investigations simply by nature are philosophical and do minimal above and over the repeat and requirement for morals of the apparatus also contend about such good feelings set that might correct in execution in our counterfeit

offspring. In any case, since moral standards are not widespread, a "right" moral code would never be chosen over others as per the general inclination of humankind in general (Goodman, 2019).

Investment in Artificial Intelligence (AI)

If any economy wants to meet the requirement of such a fast growing technological world, investment in Artificial Intelligence is its urgent need (Greene, Hoffmann, & Stark, 2019; Chetthamrongchai & Jernsittiparsert, 2020a, 2020b). Although this having both positive and negative impacts on humanity, but world must follow it to survive. Some of its highlights are given in the figure reflecting below.

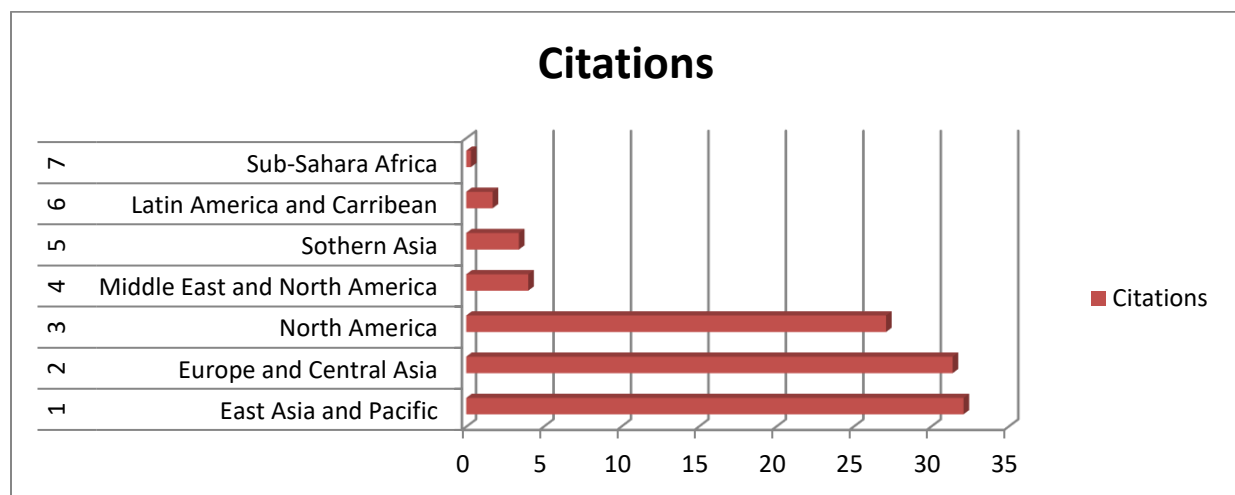


Figure 1: The Interest of Different Countries towards AI

In agreement with report of Artificial Intelligence Index in the year 2019. There is almost constant growth in the region like East Asia and Pacific, Europe and Central Asia and North America, but there is quite terrible results from other regions (Steels & Lopez de Mantaras, 2018). Middle East and North America, Southern Asia, Latin America and Caribbean and Sub-Sahara Africa will have to pay special attentions in this section. Artificial Intelligence is might be one of the reasons between developed and undeveloped nations as it throws a strong impact on almost all the operations of any nation. World must bring its efforts in from to realize these regions to invest in Artificial Intelligence to grow their people standard of living along with nations prosperity (Landon-Murray, Mujkic, & Nussbaum, 2019).

Safety Engineering - Artificial Intelligence

Regardless of whether we are effective at planning machines prepared to do breezing through an Assessment of Moral Turing, human-like execution implies some indecent activities, which ought not be adequate from the machines we structure (Allen, Varner, & Zinser, 2000). At the end of the day, we needn't bother with machines which are Full Ethical Agents (Moar, 2007) bantering regarding what is good and bad, we need our machines to be innately protected and reputable. In the right on time to

transitional period when robots are not immeasurably more proficient than people, you'd need quiet well-behaved robots as able as could be expected under the circumstances, to make gainful accomplices. Most significant can be which both of us having commonly satisfactory rules as an adequate means for settlement of debates, they don't depend on predation or insurgency (Winfield & Jirotko, 2018). On the off chance that their fundamental method for getting their need to exchange through commonly pleasant exchanges, at that point one must not a lot of care which precisely is needed by someone. In near future when automata having extreme skills in comparisons with people ought to be a more like the instance about choosing a country wherein to resign. For this situation one must not having any hope to expect having enough in aptitudes method to offer, thus human for the most part care that apparatus is well behaved that much in order to pay respect to property rights of the people. Event that they utilize a similar rule in order for harmony keeping between them, Human can expect a long haul full of prosperity future there might by long and prosperous future for us in any part of the world they invoke. In this scenario, what makes a difference most is that we as a whole offer a commonly satisfactory rules for harmony keeping between us, and commonly allows worthwhile associations, we concede "to one side" values (Martins & Barone, 2017).

Endure a wide scope of qualities from fit honest automata. A decent law which must endeavor by us in order for making and save. Rules matters in true manners (Lustig et al., 2016). Subsequently, it is recommended by us that absolutely theoretical discussion of moralities for apparatuses must enhanced through rational work planned for apparatuses making with respects to another arena "computer-based intelligence Safety Engineering." Some concrete findings in this significance zone just has started. In agreement with report of Artificial Intelligence Index in the year 2019. There is almost constant growth in the region like East Asia and Pacific, Europe and Central Asia and North America, but there are quite terrible results from other regions. Middle East and North America, Sothern Asia, Latin America and Caribbean and Sub-Sahara Africa will have to pay special attentions in this section. Artificial Intelligence is might be one of the reasons between developed and undeveloped nations as it throws a strong impact on almost all the operations of any nation. World must bring its efforts in from to realize these regions to invest in Artificial Intelligence to grow their people standard of living along with nations prosperity (Koehler, 2018).

A typical subject in Computer based intelligence wellbeing research is the plausibility of having a hyper-genius specialist in an equipment

which is fixed in order to keep it away from doing any act which is hazardous for humanity. Thoughts like this originate through logical visionaries, like having an instance of suggestion regarding restricting transhumant machines so their yields could be considered and utilized securely. Thus, it is proposed that a thought for AI which is oracle base, that will be just equipped for addressing questions. At the end of year 2010, we are having a suggestion that possibility of an "airtight" peculiarity. It is proposed by him regarding that for wellbeing reasons, frameworks of AI, initially be limited to recreated cybernetic universes until their conduct inclinations could be completely comprehended under the controlled conditions (Meek, Barham, Beltaif, Kaadoor, & Akhter, 2016).

Formalized thought of AI restriction star tool which speaks to "artificial intelligence Boxing" like personal computer security challenge (Yampolskiy, 2012). Artificial Intelligence Confinement Problems as a test about limiting a misleadingly insightful element to a kept situation from which it can't trade data with the outside condition by means of real or undercover channels if such data trade was not approved by the containment authority (Dhai, 2018). An AI framework which prevails with regards to damaging the personal computer convention is said to have gotten away (Yampolskiy, 2012).

Existing Challenges

The proposed convention depends on the requirement which classified "safe inquiries" having confined replies (Aicardi, Fothergill, Rainey, Stahl, & Harris, 2018). A protected inquiry is characterized the only for whom an individual might discover a reply with no assistance expected from genius, all alone legitimacy. For what reason is this valuable? In the right on time to transitional period when robots are not immeasurably more proficient than people, you'd need quiet well-behaved robots as able as could be expected under the circumstances, to make gainful accomplices. Most significant can be which both of us having commonly satisfactory rules as an adequate means for settlement of debates, they don't depend on predation or insurgency. Assume that a researcher taking a shot at a solution for malignancy is taking a gander at various potential fixes. Every individual can be created and tried by ignoring the AI help, yet might require around 3 exertion years for each. Having plan to whom try at first, the case if the investigators accepts which they having working probability which is almost equal to it? On the off chance that an off-base alternative is picked to be tried first, humankind will even now get a solution for malignant growth, yet it will happen 3 years after the fact. Consider the possibility that we could request that the AI propose which alternative to attempt first (Pender, 2019).

This inquiry is alright for various reasons. In the first place, every possible reply with equivalent likelihood to be right. In addition to this, a person without any assistance from AI can answer thus approaching help from AI to speedup improvement however not the slightest bit changes the result. It is basically equivalent to being fortunate at speculating numerous decision answers (Maas, 2019). At last, the response to this inquiry can be programmed in a solitary piece, making it difficult to conceal additional messages in the given replies (Winfield, 2016).

For assurance which potentially inquiry, is sheltered, a specialist gathering which can be utilized to survey it. Experts should all be preparing AI security engineers, implying what they know about AP plans and its condition just as the most recent improvements in machine morals. Specialists may likewise should be prepared in personal computer brain science, a right now non-existent calling which may turn into a reality later on. A current order which may be of most noteworthy assistance for preparing AI question survey specialists is Art metric a form of it suggests that distinguishes, orders and confirms AI specialists, robots, and computer generated reality symbols for security purposes (Yampolskiy & Govandaraju, 2007, 2008; Yampolskiy, 2012).

Literature Review

As the great test of AI security designing, the issue of creating wellbeing instrument is proposed by us for self-improvement frameworks. In the event that a misleadingly shrewd machine is as skilled as a human designer of planning the up and coming age of astute frameworks, it is critical to ensure that any security instrument joined in the underlying structure is as yet utilitarian after a great many ages of consistent personal growth without human obstruction. In a perfect world each age of self-improving framework ought to have the option to create an obvious verification of its wellbeing for outer assessment. It is disastrous to enable a safe wise machine to structure an innately risky update for itself bringing about an increasingly fit and progressively hazardous framework (Soni, Sharma, Singh, & Kapoor, 2019). Some have contended that this test is either not reasonable or in the event that it is feasible one won't have the option to demonstrate that the found arrangement is right (Haq, Nawaz, Mahtab, & Cheema, 2012). As framework complexity expands, the quantity of blunders in plan builds star optionality or maybe even exponentially. Indeed, even a, solitary bug in a self-improving framework will disregard all the security ensures. More regrettable yet, a bug could be presented considerably after the structure is finished either by means of an arbitrary change brought about by insufficiencies in equipment

or by means of a characteristic occasion, for example, a short out altering some part of the framework (Risse, 2019).

Rights of the Robots

Particular sorts of research, for example, human cloning, certain restorative or mental trials on people, creature (incredible primate) explore, and so on are viewed as exploitative in light of their potential hindering effect on the guineas pigs as are either prohibited or confined by law (Hussain, Musa, & Omran, 2018). Also bans exist on improvement of perilous advancements, for example, substance, organic and atomic weapons as a result of the staggering impacts such advances may apply of the mankind (Hussain et al., 2012). So also we contend that specific kinds of man-made reasoning exploration fall under the class of perilous advancements and ought to be confined (Sniecinski & Seghatchian, 2018). Traditional AI research in which a personal computer is educated to computerize human conduct in a specific area, for example, mail arranging or spellchecking archives is positively moral and doesn't present an existential hazard issue to humankind.

Then again, we argue that Artificial General Intelligence (AGI) research ought to be viewed as non-ethical. This pursues legitimately from various perceptions (Bordas, Natarajan, & Zilian,

2018). To begin with, genuine AGIs will be fit for all-inclusive critical thinking and recursive personal growth. Subsequently they having people outcompeting capability within any space basically making mankind pointless thus subject to termination. Moreover, a genuinely AGI framework may have a sort of awareness practically identical to mankind making robot enduring a genuine probability and investigations with AGI deceptive (Lodder & Wisman, 2016; Shahriari & Shahriari, 2017). Mankind ought not to put its future in the hands of the machines since it won't have the option to take the power back.

As a rule, a machine ought to never be in a situation to end human life or to make some other non-inconsequential moral or good judgment concerning individuals. A world run by machines will prompt capricious ramifications for human culture, way of life and generally likelihood of endurance for the mankind. It is proposed by Bill Joy that: In conclusion we might want to address a sub-part of machine morals which on the surface has little to do with wellbeing, however which is professed to assume a job in basic leadership by moral machines. Whether our mind kid ran ought to be given rights, benefits and obligations appreciated by those allowed personhood by society Robot Rights (Shah et al., 2019). We accept the appropriate response is an unequivocal "no." While all human keeps an eye

on are "made equivalent," machines ought to be mediocre by plan; they ought to have no rights and ought to be extra varying, making their utilization as instruments substantially more helpful for their makers. Our perspective on this issue is anything but difficult to legitimize, since machines can't feel torment (or less questionably can be structured not to feel anything) they can't encounter enduring whenever decimated. The machines could unquestionably be our equivalents in capacity however they ought not to be intended to be our equivalents as far as rights. Robot rights, whenever without a doubt, would unavoidably prompt social liberties including casting a ballot rights (Waser, 2015).

Given the anticipated number of robots in the following not many decades and the simplicity of duplicating conceivably smart programming, a society with casting a ballot misleadingly shrewd individuals will immediately get ruled by them, prompting the issues portrayed in the above segments. We might want to offer some expansive recommendations for the future bearings of research planned for neutralizing the issues introduced in this paper (Hussain, Mosa, & Omran, 2017). To start with, the exploration itself needs to transform from the area of enthusiasm of just theoreticians and scholars to the immediate inclusion of rehearsing personal computer

researchers. Constrained AI frameworks should be created as an approach to explore different avenues regarding non-human personalities and to improve current security conventions. The issues brought up in this paper have been only in the area of sci-fi essayists and savants for quite a long time (Hussain, Musa, & Omran, 2019). Maybe through such means or possibly in view of promotion by associations like Singularity Institute for Artificial Intelligence (SIAI) the point of AI wellbeing has gradually begun to show up in standard distributions.

We are happy to report that some fundamental work has started to show up in logical scenes which plan to explicitly address issues of AI security and morals, if just in human-level-insight frameworks. One of the most esteemed logical magazines, *Science*, has as of late distributed on the theme of Robot ethics and various papers on Machine Ethics and Cyborg Ethics have been distributed as of late in different lofty diaries. Meanwhile we are ideal to accept that the AGI may introduce genuine dangers to mankind's very presence and to continue or not to continue in like

manner. We might proposed that circumstance wherein humankind has gotten itself: Step by step, in any case, the machines are making progress upon us; step by step we are getting progressively subservient to them; Every machine of each sort ought to be crushed by the well-wisher of his species. May there be no special cases made, no quarter appeared; let us immediately return to the primitive state of the race (Hussain, Mosa, & Omran, 2018). On the off chance that it be asked this is incomprehensible under the current state of human issues, this on the double demonstrates that the wickedness is now done, that our subjugation has started in great sincere, that we have raised a race of creatures whom it is past our capacity to pulverize, and that we are oppressed as well as are totally passive in our servitude. From above given detailed debate we can propose that:

H1: There is significant relationship between machine ethics and artificial intelligence in the ASEAN countries.

Research Methods

This aim of the current article is to analyze the influence of the machine ethics such as machine morality, computational morality, computational ethics, smart and safe mobility, digital innovation personalized and remote healthcare on the performance of artificial intelligence of the ASEAN countries from 1998 to 2014. Data were gathered from the AI databases and World Bank Databases and STATA was employed for the logistic model and other analysis of the article. The performance of artificial intelligence (PAI) is measured by the

$$PAI_{it} = \beta_0 + \beta_1 MM_{it} + \beta_2 CM_{it} + \beta_3 CE_{it} + \beta_4 SSM_{it} + \beta_5 DIPRH_{it} + e_{it}$$

Where, PAI represents performance of artificial intelligence, MM means machine morality, CM is computational morality, CE is computational ethics, SSM represents smart and safe mobility,

DIPRH means digital innovation personalized and remote healthcare, α is a constant and the term ϵ_{it} is used to represent the error in the analysis.

increase in the work efficiency in terms of customer dealing while machine ethics is measured by the machine morality (MM) (number of perfect articles), computational morality (CM) (speed of the work), computational ethics (CE) (number of accurate results), smart and safe mobility (SSM) (safety measures), digital innovation personalized and remote healthcare (DIPRH). Based on these variables, current study develops the following equation:

Research Results

The finding includes the correlation matrix, detail of variables along its mean and standard deviation, all the assumption of regression, Hausman test for selection of fixed model and random model and the path analysis for hypotheses testing. The descriptive analysis exposed the minimum and maximum values of the constructs along with the mean and standard deviation that explain the values are far away from the standard. Table 1 provided the descriptive statistics given below:

Table 1: Descriptive Analysis

Variable	Observations	Mean	Std. Dev.	Min	Max
PAI	170	1.618	0.567	-0.179	3.437
MM	170	1.191	0.205	0.021	1.771
CM	170	0.249	0.256	0.000	0.846
CE	170	0.158	0.214	0.000	0.983
SSM	170	4.974	0.841	2.862	6.399
DIPRH	170	10.541	0.214	201.212	321.025

The correlation matrix explains the both things correlation among the constructs as well as verify the multicollinearity issue. The findings revealed that the constructs are associated with each

other and no multicollinearity exist in the model because values are less than 0.90, Table 2 provided the correlation matrix given below:

Table 2: Correlation Matrix

Variables	PAI	MM	CM	CE	SSM	DIPRH
PAI	1.000					
MM	-0.173	1.000				
CM	0.099	0.241	1.000			
CE	-0.054	0.005	0.064	1.000		
SSM	0.013	0.179	0.161	-0.106	1.000	
DIPRH	0.249	0.137	-0.405	-0.363	-0.090	1.000

The multicollinearity is the first assumption to run the regression analysis on the model and firstly this study checked it by correlation matrix and now it is verify by the Variance Inflation Factor (VIF).

The outcomes show that no multicollinearity exist in the model, the reason is that the VIF values are less than 5 and tolerance values are less than 0.10. Table 3 provided the VIF given below:

Table 3: Variance Inflation Factor

	VIF	1/VIF
MM	1.579	0.633
CM	1.241	0.806
CE	1.217	0.822
SSM	1.169	0.855
DIPRH	1.096	0.912
Mean VIF	1.26	.

The normality is the second assumption of the regression analysis that is verified by employed the Skewness and Kurtosis and the figures highlighted that abnormality issues are exists in the data because the probabilities values of all the constructs are less than 0.05 that reject the null hypothesis of data has normally distributed. The

normality issue does not affects the results if the data is large means more than 100 observation and in this study data has 170 observation thus abnormality does not effected the results. Table 4 given as under highlighted the Skewness and Kurtosis.

Table 4: Skewness and Kurtosis Test

Variable	Observations	Pr (Skewness)	Pr (Kurtosis)	adj_chi2 (2)	Prob>chi2
PAI	170	0.311	0.036	5.420	0.066
MM	170	0.208	0.000	27.660	0.000
CM	170	0.000	0.002	26.130	0.000
CE	170	0.000	0.000	64.410	0.000
SSM	170	0.000	0.003	20.610	0.000
DIPRH	170	0.000	0.000	.	0.000

The autocorrelation and homoscedasticity are the last two assumption to run the regression analysis in the article. The autocorrelation is checked by employed the Wooldridge test while homoscedasticity is verified by employed the Breusch-Pagan test. The outcomes uncovered that heteroscedasticity and autocorrelation issues are

exit in the model and the effects of these issues are controlled by using the logistic model in the regression.

The both models of random and fixed has been employed to check the appropriate model for the study. Table 5 and Table 6 given as under highlighted the model of fixed and random effect.

Table 5: Fixed Effect Model

PAI	Coef.	S.E.	t-value	p-value	L.L	U.L.	Sig
MM	1.037	0.201	5.160	0.000	0.641	1.433	***
CM	-0.138	0.337	-0.410	0.683	-0.801	0.526	
CE	0.951	0.251	3.800	0.000	0.458	1.445	***
SSM	-0.368	0.095	-3.870	0.000	-0.555	-0.180	***
DIPRH	0.014	0.002	7.650	0.000	0.010	0.018	***
Constant	1.909	0.547	3.490	0.001	0.832	2.987	***
R-squared	0.460		Prob > F		0.000		

*** $p < .01$, ** $p < .05$, * $p < .1$

Table 6: Random Effect Model

PAI	Coef.	S.E.	t-value	p-value	L.L.	U.L.	Sig
MM	0.950	0.188	5.060	0.000	0.582	1.319	***
CM	-0.039	0.201	-0.190	0.846	-0.433	0.355	
CE	0.597	0.197	3.030	0.002	0.211	0.983	***
SSM	-0.032	0.062	-0.510	0.611	-0.154	0.091	
DIPRH	0.015	0.002	8.500	0.000	0.012	0.019	***
Constant	0.357	0.436	0.820	0.413	-0.498	1.212	
Overall r-squared	0.312		Prob > chi2		0.000		

*** $p < .01$, ** $p < .05$, * $p < .1$

The Hausman test is employed to check the appropriateness of the model in the study. The findings uncovered that the probability value is

higher than 0.05 that reject the alternative hypothesis about the fixed effect is appropriate. Table 7 provided the Hausman test given below:

Table 7: Hausman Test

	Coef.
Chi-square test value	11.743
P-value	0.068

The path analysis shows the relationships among the understudy variables. The figures highlighted that positive nexus among the machine ethics such as machine morality (MM) (number of perfect articles), computational morality (CM) (speed of the work), computational ethics (CE) (number of accurate results), smart and safe mobility (SSM) (safety measures), digital innovation personalized and remote healthcare (DIPRH) and performance of AI in the ASEAN

countries around the globe because positive sign exits with beta values. In addition, the links among the machine ethics such as machine morality (MM), computational morality (CM), computational ethics (CE), smart and safe mobility (SSM), digital innovation personalized and remote healthcare (DIPRH) and performance of AI are significant because of p and t values the meet the standard criteria. Table 8 given as under highlighted the logistic regression model.

Table 8: Regression Analysis (Logistic Model)

PAI	Coef.	S.E.	t-values	P>t	L.L.	U.L.
MM	1.037	0.128	8.070	0.000	0.754	1.320
CM	0.438	0.231	1.990	0.034	0.647	0.372
CE	0.951	0.210	4.540	0.001	0.490	1.413
SSM	0.668	0.217	3.078	0.002	0.844	0.109
DIPRH	0.014	0.003	4.530	0.001	0.007	0.021
_cons	1.909	0.922	2.070	0.039	0.340	4.159

Conclusion and Discussions

This aim of the current article is to analyze the influence of the machine ethics such as machine morality, computational morality, computational ethics, smart and safe mobility, digital innovation personalized and remote healthcare on the performance of artificial intelligence (AI) of the ASEAN countries. Data were gathered from the AI databases and World Bank Databases and STATA was employed for the logistic model and other analysis of the article. The finding revealed that all the machines ethics such as machine morality, computational morality, computational ethics, smart and safe mobility, digital innovation personalized, and remote healthcare have positive nexus with the performance of AI in the ASEAN countries of the world. When the machine ethics are increase it increase the accuracy, efficiency and effectiveness of business processes that enhance the performance of AI in the firm.

These findings make the policy makers more attentive regarding the ethics of the machine that enhance the performance of AI in the business. The present study reached to the conclusion that if the machine ethics such as machine morality, computational morality, computational ethics, smart and safe mobility, digital innovation personalized and remote healthcare are increase it increase the accuracy, efficiency and effectiveness

of business processes that enhance the performance of AI in the firm.

However, this study has some limitation such as it takes only five machine ethics and ignored other machine ethics that can used by the upcoming researchers. The future study also made a cross country analysis other than the ASEAN countries that is ignored by the current study.

References

- Aicardi, C., Fothergill, B., Rainey, S., Stahl, B., & Harris, E. (2018). Accompanying technology development in the Human Brain Project: from foresight to ethics management. **Futures**, *102*(1), 114-124.
- Allen, C., Varner, G., & Zinser, J. (2000). Prolegomena to any future artificial moral agent. **Journal of Experimental & Theoretical Artificial Intelligence**, *12*(3), 251-261.
- Bordas, S., Natarajan, S., & Zilian, A. (2018). Mathematical modelling and artificial intelligence in Luxembourg: Twenty PhD students to be trained in data-driven modelling. **ERCIM News**, *115*, 39-40.
- Chetthamrongchai, P. & Jernsittiparsert, K. (2020a). The Forthcoming Revolution of Artificial Intelligence and its Impacts on Pharmacy Business in Thailand.

- Systematic Reviews in Pharmacy**, **11**(1), 119-128.
- Chetthamrongchai, P. & Jermsittiparsert, K. (2020b). The Impact of Artificial Intelligence Outcomes on the Performance of Pharmacy Business in Thailand. **Systematic Reviews in Pharmacy**, **11**(1), 139-148.
- Dhai, A. (2018). Advances in biotechnology: Human genome editing, artificial intelligence and the Fourth Industrial Revolution—the law and ethics should not lag behind. **South African Journal of Bioethics and Law**, **11**(2), 58-59.
- Geis, J., Brady, A., Wu, C., Spencer, J., Ranschaert, E., Jaremko, J., Shields, W. (2019). Ethics of artificial intelligence in radiology: Summary of the joint European and North American multisociety statement. **Radiology**, **293**(2), 436-440.
- Goodman, E. (2019). Smart City Ethics: The challenge to democratic governance draft chapter for oxford handbook of the ethics of artificial intelligence. **Business and Economic Research**, **2**(2), 25-34.
- Greene, D., Hoffmann, A., & Stark, L. (2019). **Better, nicer, clearer, fairer: A critical assessment of the movement for ethical artificial intelligence and machine learning**. Paper presented at the 52nd Hawaii International Conference on System Sciences, Honolulu, United States.
- Haq, M., Nawaz, M., Mahtab, N., & Cheema, A. (2012). Determinants of Wage Growth: An Empirical Analysis of Private Formal Sector in Bahawalpur Division. **Business and Economic Research**, **2**(1), 15-24.
- Hussain, M., Mosa, M., & Omran, A. (2017). The Mediating Impact of Profitability on Capital Requirement and Risk Taking by Pakistani Banks. **Journal of Academic Research in Economics**, **9**(3), 433-443.
- Hussain, M., Mosa, M., & Omran, A. (2018). The impact of owners behaviour towards risk taking by Pakistani Banks: Mediating role of profitability **Journal of Academic Research in Economics**, **10**(3), 455-465.
- Hussain, M., Musa, M., & Omran, A. (2018). The Impact of Private Ownership Structure on Risk Taking by Pakistani Banks: An Empirical Study. **Pakistan Journal of Humanities and Social Sciences**, **6**(3), 325-337.
- Hussain, M., Musa, M., & Omran, A. (2019). The Impact of Regulatory Capital on Risk Taking By Pakistani Banks. **SEISENSE Journal of Management**, **2**(2), 94-103.

- Hussain, M., Ramzan, M., Ghauri, M., Akhtar, W., Naeem, W., & Ahmad, K. (2012). Challenges and failure of Implementation of Basel Accord II and reasons to adopt Basel III both in Islamic and conventional banks. **International Journal of Business and Social Research**, 2(4), 149-174.
- Koehler, J. (2018). Business process innovation with artificial intelligence: Levering Benefits and controlling operational risks. **European Business & Management**, 4(2), 55-66.
- Landon-Murray, M., Mujkic, E., & Nussbaum, B. (2019). Disinformation in Contemporary US Foreign Policy: Impacts and ethics in an era of fake news, social media, and artificial intelligence. **Public Integrity**, 14(1), 1-11.
- Lodder, A., & Wisman, T. (2016). Artificial intelligence techniques and the smart grid: Towards smart meter convenience while maintaining privacy. **Journal of Internet Law**, 19(6), 20-27.
- Lustig, C., Pine, K., Nardi, B., Irani, L., Lee, M., Nafus, D., & Sandvig, C. (2016). Algorithmic authority: The ethics, politics, and economics of algorithms that interpret, decide, and manage. **Public Integrity**, 14(4), 22-32.
- Maas, M. (2019). International law does not compute: Artificial intelligence and the development, displacement or destruction of the global legal order. *Melb. J. Int'l L.*, 20(1), 29-34.
- Martins, M., & Barone, D. (2017). Planned Obsolescence Using Nanotechnology for Protection Against Artificial Intelligence. **Journal of Internet Law**, 20(1), 30-37.
- Meek, T., Barham, H., Beltaif, N., Kaadoor, A., & Akhter, T. (2016). Managing the ethical and risk implications of rapid advances in artificial intelligence: A literature review. **European Business & Management**, 4(1), 51-53.
- Moar, G. (2007). The nature, importance, and difficulty of machine ethics. **IEEE Intelligent System**, 22(5), 13-16.
- Pender, S. (2019). The creation of an ethical Artificial Intelligence [AI] policy? An exploration into the early days of the European Union's ethical rhetoric in the field of AI. **Public Integrity**, 12(4), 21-27.
- Risse, M. (2019). **Human rights, artificial intelligence and heideggerian technoskepticism: The long (worrisome?) view**. Cambridge: Carr Center for Human Rights Policy.

- Shah, P., Kendall, F., Khozin, S., Goosen, R., Hu, J., Laramie, J., Schork, N. (2019). Artificial intelligence and machine learning in clinical development: A translational perspective. **NPJ digital medicine**, **2**, 69.
- Shahriari, K., & Shahriari, M. (2017). **IEEE standard review - Ethically aligned design: A vision for prioritizing human wellbeing with artificial intelligence and autonomous systems**. Paper presented at the 2017 IEEE Canada International Humanitarian Technology Conference, Toronto, Canada.
- Sniecinski, I., & Seghatchian, J. (2018). Artificial intelligence: A joint narrative on potential use in pediatric stem and immune cell therapies and regenerative medicine. **Transfusion and Apheresis Science**, **57**(3), 422-424.
- Soni, N., Sharma, E., Singh, N., & Kapoor, A. (2019). Impact of Artificial Intelligence on Businesses: from Research, Innovation, Market Deployment to Future Shifts in Business Models. **NPJ Digital Medicine**, **2**(2), 11-15.
- Steels, L., & Lopez de Mantaras, R. (2018). The Barcelona declaration for the proper development and usage of artificial intelligence in Europe. **AI Communications**, **31**(6), 485-494.
- Waser, M. (2015). Designing, implementing and enforcing a coherent system of laws, ethics and morals for intelligent machines (including humans). **Procedia Computer Science**, **71**, 106-111.
- Winfield, A. (2016). Written evidence submitted to the UK Parliamentary Select Committee on Science and Technology Inquiry on Robotics and Artificial Intelligence. **Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences**, **371**(2132), 201-235.
- Winfield, A., & Jirotko, M. (2018). Ethical governance is essential to building trust in robotics and artificial intelligence systems. **Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences**, **376**(2133), 205-211.
- Yampolskiy, R. (2012). Leakproofing Singularity-Artificial Intelligence Confinement Problem. **Journal of Consciousness Studies**, **19**(1-2), 194-214.
- Yampolskiy, R., & Govandaraju, V. (2007). **Behavioral biometrics for recognition and verification of game bots**. Paper presented at the 8th annual European

Game-On Conference on simulation and
AI in Computer Games, Bologna, Italy.
Yampolskiy, R., & Govindaraju, V. (2008).
Behavioral biometrics for verification and

recognition of malicious software agent.
Procedia Computer Science, 6943,
694303.