UNIVERSITAS AHMAD DAHLAN

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KAMPUS 4 : Jalan Kolektor Ringroad Selatan, Tamanan, Banguntapan, Bantul, Yogyakarta
KAMPUS 5 : Jalan Ki Ageng Pemanahan 19, Sorosutan, Yogyakarta
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Nomor : R/659/B.6/VII/2022
Lampiran : -
Perihal : Klarifikasi karya ilmiah
a.n. Hapsoro Agung Jatmiko, S.T., M.Sc.

25 Dzulhijjah 1443 H
26 Juli 2022 M

Kepada
Yth. Kepala Lembaga Layanan DIKTI Wilayah V
di Yogyakarta

Assalamualaikum w.w.
Menindaklanjuti pemberitahuan Bapak mengenai kemiripan karya ilmiah pada usulan jabatan akademik atas nama Sdr. Hapsoro Agung Jatmiko, S.T., M.Sc. (NIDN 0522069102) dan membutuhkan klarifikasi terhadap karya ilmiah tersebut.
Sehubungan dengan hal tersebut, kami bermaksud melampirkan klarifikasi artikel yang bersangkutan.
Selanjutnya, kami mohon bantuan Bapak untuk menyampaikan klarifikasi artikel yang bersangkutan ke Tim Penilai Penetapan Angka Kredit untuk dapat diproses lebih lanjut.

Atas perkenan Bapak disampaikan terima kasih.

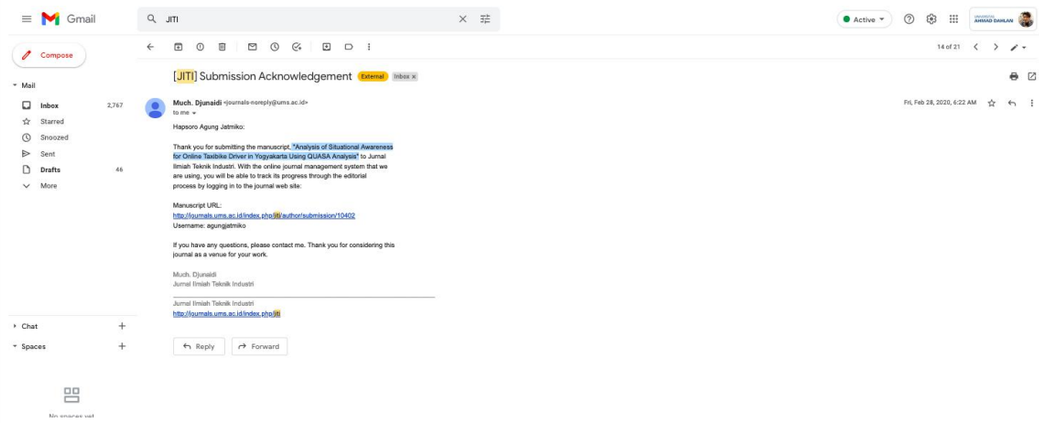
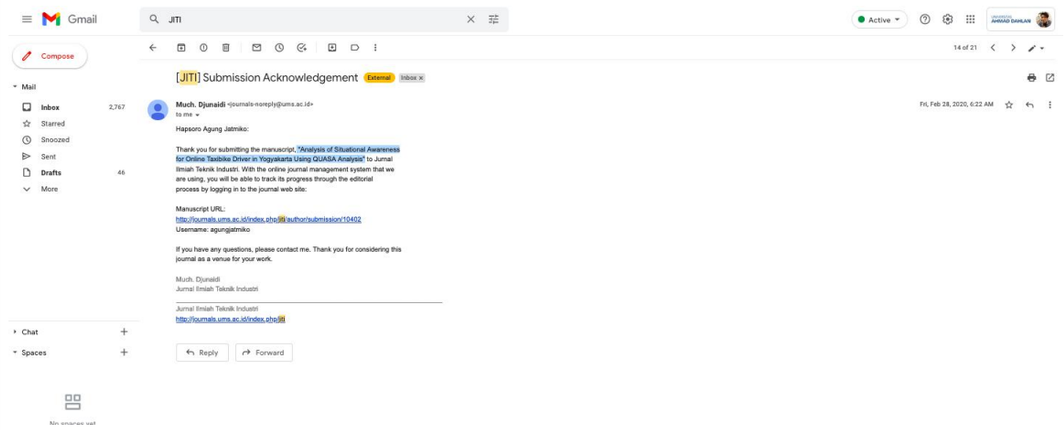
Wassalamualaikum w.w.

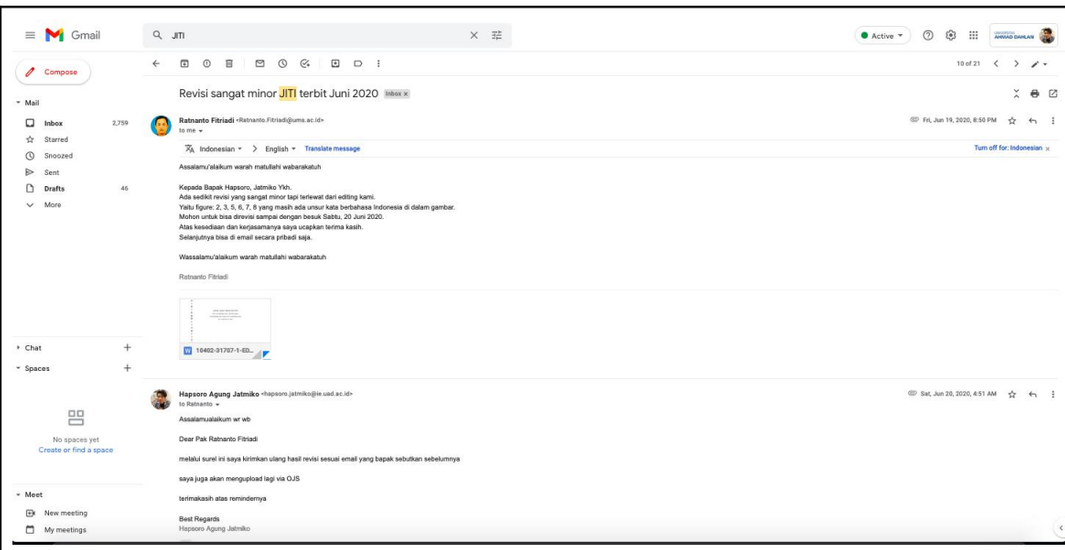
Rektor,

Dr. Muchlas, M.T.
NIP. 196202181987021 001

Tembusan :
Hapsoro Agung Jatmiko, S.T., M.Sc.
Universitas Ahmad Dahlan

Klarifikasi Paper dengan Judul "*Analysis of Situational Awareness for Online Taxibike Driver in Yogyakarta Using QUASA Analysis*"

Poin Klarifikasi	Bukti Klarifikasi
1.Penulis melakukan *submission* pada OJS Jurnal Ilmiah Teknik Industri (JITI) Universitas Muhammadiyah Surakarta (UMS) pada tanggal 28 Februari	
2. Setelah melakukan Submission, reviewer mengontak penulis untuk memberikan point review pada manuscript yang di submit, tertanggal 2 Juni 2020	
3. Melalui proses review yang diberikan dan dikerjakan oleh penulis, maka Editor in Chief mengeluarkan Letter of Acceptance pada tanggal 4 Juni 2020 (file pdf kami lampirkan di bawah)	ISSN 2460-4038 (online) * ISSN 1412-6869 (print) JURNAL ILMIAH TEKNIK INDUSTRI No. : 025/A.1-III/JITI/VI/2020 Surakarta, 3 June 2020 Subj. : Acceptance Letter To: Mr. Hapsoro Agung Jatmiko Universitas Ahmad Dahlan Yogyakarta Dear Mr. Hapsoro Agung Jatmiko *Assalaamu'alaikum wa rahmatullaahi wa barakaatuh* *Alhamdulillah*, all praise is due to Allah, the Most Gracious and the Most Merciful. We congratulate that the manuscript that you have sent to the editor of Jurnal Imiah Teknik Industri, Title : Analysis of Situational Awareness for Online Taxibike Driver in Yogyakarta Using QUASA Code : 10402 Author(s): Hapsoro Agung Jatmiko has been accepted for publication in Vol. 19 No. 1, which will be published in June 2020. For this reason, a publication fee of IDR 1,000,000 can be transferred to Bank Mandiri, account number 138.00.0501276.5 (Much Djunaidi). We expect publication fees to be transferred no later than June 15, 2020. Thank you for your attention. *Wassalaamu'alaikum wa rahmatullaahi wa barakaatuh* Editor in Chief, Much. Djunaidi Sekretariat: Jurusan Teknik Industri, Fakultas Teknik, Universitas Muhammadiyah Surakarta.

4. Reviewer memberikan point revisi minor yang terlewatkan pada proses review sebelumnya, pada tanggal 19 Juni 2020	

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TEKNIK INDUSTRI

No. : 025/A.1-III/JITI/VI/2020 Surakarta, 3 June 2020
Subj. : Acceptance Letter

To: **Mr. Hapsoro Agung Jatmiko**
Universitas Ahmad Dahlan
Yogyakarta

Dear Mr. **Hapsoro Agung Jatmiko**

Assalaamu'alaikum wa rahmatullaahi wa barakaatuh

Alhamdulillah, all praise is due to Allah, the Most Gracious and the Most Merciful.

We congratulate that the manuscript that you have sent to the editor of Jurnal Imiah Teknik Industri,

Title : **Analysis of Situational Awareness for Online Taxibike Driver in Yogyakarta Using QUASA**
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Thank you for your attention.

Wassalaamu'alaikum wa rahmatullaahi wa barakaatuh

Editor in Chief,

Much. Djunaidi

Sekretariat: Jurusan Teknik Industri, Fakultas Teknik, Universitas Muhammadiyah Surakarta.
Gedung H, Lantai 2, Kampus II, Jalan Ahmad Yani Tromol Pos 1, Pabelan, Surakarta, 57102, Indonesia
Telp. 0271.717417 ext. 3237, email: jurnal.industri@ums.ac.id, http:// journals.ums.ac.id/index.php/jiti/index

Tertanda

Hapsoro Agung Jatmiko M.Sc.

LEMBAGA PENELITIAN DAN PENGABDIAN KEPADA MASYARAKAT
UNIVERSITAS AHMAD DAHLAN
Jl. Gondosuli No. 1B Semaki Yogyakarta, Telp. 0274-542886, 0274-583515 ext. 1502, 1503 Fax. 0274-542886, Website : lppm.uad.ac.id, email : lppm@uad.ac.id

SURAT PERJANJIAN PELAKSANAAN PENELITIAN

Nomor: PF-133/SP3/LPPM-UAD/IV/2019

Pada hari ini, **Senin** tanggal **Delapan** bulan **April** tahun **Dua ribu sembilan belas (08-04-2019)**, kami yang bertandatangan di bawah ini:

1. Nama : **Dr. Widodo, M.Si.**
   Jabatan : Kepala Lembaga Penelitian dan Pengabdian Kepada Masyarakat Universitas Ahmad Dahlan (LPPM UAD), selanjutnya disebut sebagai **PIHAK PERTAMA.**
2. Nama : **Farid Ma'ruf, S.T., M.Eng.**
   Jabatan : Dosen/Peneliti pada Program Studi **Teknik Industri Fakultas Teknologi Industri** Universitas Ahmad Dahlan (UAD), selaku Ketua Peneliti, selanjutnya disebut **PIHAK KEDUA.**

Kedua belah pihak menyatakan setuju dan mufakat untuk mengadakan perjanjian pelaksanaan penelitian untuk selanjutnya disebut Surat Perjanjian Pelaksanaan Penelitian (SP3) dengan ketentuan dan syarat-syarat sebagai berikut.

JUDUL PENELITIAN

Pasal 1

(1) PIHAK PERTAMA memberikan pekerjaan kepada PIHAK KEDUA dan PIHAK KEDUA menyatakan menerima pekerjaan dari PIHAK PERTAMA berupa kegiatan pada skim **Penelitian Fundamental (PF).**

(2) Judul penelitian sebagaimana dimaksud dalam ayat (1) di atas adalah: "ANALISIS SITUATIONAL AWARENESS PADA PENGEMUDI OJEK ONLINE RODA DUA DI KOTA YOGYAKARTA DENGAN METODE QUASA."

PERSONALIA PELAKSANA PENELITIAN

Pasal 2

Pelaksana kegiatan ini terdiri dari:

Ketua Peneliti	: Farid Ma'ruf, S.T., M.Eng.
Pembimbing/Konsultan	: -
Anggota Peneliti 1	: Hapsoro Agung Jatmiko, S.T., M.Sc.
Anggota Peneliti 2	:

BENTUK DAN JANGKA WAKTU PERJANJIAN

Pasal 3

PIHAK KEDUA melaksanakan penelitian dalam jangka waktu paling lama **6 (enam) bulan** sejak ditandatangani SP3 ini, dan menyerahkan hasil laporan penelitian sementara kepada PIHAK PERTAMA selambat-lambatnya pada **08 Oktober 2019.**

LUARAN/*OUTPUT* PENELITIAN

Pasal 4

PIHAK KEDUA berkewajiban untuk merealisasikan luaran/*output* penelitian seperti yang dijanjikan dalam proposal penelitian di luar Laporan Hasil Penelitian.

BIAYA PENELITIAN DAN CARA PEMBAYARAN

Pasal 5

PIHAK PERTAMA menyediakan dana pelaksanaan penelitian kepada PIHAK KEDUA sejumlah **Rp 9.000.000,00 (Sembilan juta rupiah)** yang dibebankan pada Anggaran Pendapatan dan Belanja (APB) LPPM UAD Tahun Akademik 2018/2019 dibayarkan melalui rekening bank atas nama Ketua Peneliti oleh Bidang Finansial UAD dengan tahapan sebagai berikut.

(a) **Tahap I sebesar 70% x Rp 9.000.000,00 = Rp 6.300.000,00 (Enam juta tiga ratus ribu rupiah)** yang akan dibayarkan selambat-lambatnya dua minggu setelah SP3 ini ditandatangani oleh PARA PIHAK dan PIHAK KEDUA telah mengunggah file scan SP3 ini pada portal UAD.

(b) **Tahap II sebesar 30% x Rp 9.000.000,00 = Rp 2.700.000,00 (Dua juta tujuh ratus ribu rupiah)** yang akan dibayarkan setelah PIHAK KEDUA menyelesaikan seluruh kewajibannya dalam jangka waktu seperti yang dimaksud dalam Pasal 3 serta dinyatakan benar dan lengkap.

PELAKSANAAN PEMBIMBINGAN

Pasal 6

(1) Khusus peneliti skema Penelitian Dosen Pemula (PDP) wajib melakukan pembimbingan atau konsultasi dengan dosen pembimbing penelitiannya paling sedikit 3 (tiga) kali pembimbingan.

(2) Pembimbingan sebagaimana dimaksud dalam ayat (1) yaitu pembimbingan dalam hal:
a. penyusunan angket/kuesioner dan atau teknik pengumpulan data lainnya;
b. analisis data dan interpretasinya;
b. penyusunan hasil penelitian, pembahasan, penarikan kesimpulan.

(3) Pembimbingan sebagaimana dimaksud dalam ayat (1) dan ayat (2) dituliskan dalam form pembimbingan yang ditandatangani oleh peneliti dan dosen pembimbing penelitian.

JENIS LAPORAN PENELITIAN

Pasal 7

(1) PIHAK KEDUA wajib menyusun dan menyampaikan laporan penelitian baik secara *on line* melalui portal UAD maupun *hardcopy* kepada PIHAK PERTAMA yang terdiri atas:
a. Laporan Kemajuan
b. Laporan Sementara
b. Laporan Akhir Penelitian

(2) Berkas **Laporan Kemajuan** digunakan sebagai bahan monitoring dan evaluasi (monev) internal.

(3) Berkas **Laporan Sementara** digunakan sebagai bahan kolokium laporan penelitian.

(4) Berkas **Laporan Akhir Penelitian** merupakan revisi dari Laporan Penelitian Sementara yang telah dikolokiumkan.

MONITORING DAN EVALUASI

Pasal 8

(1) PIHAK PERTAMA berhak untuk melakukan monitoring dan evaluasi (monev) internal pelaksanaan penelitian, baik secara administrasi maupun substansi.

(2) Pemantauan kemajuan penelitian dilakukan oleh Tim Monev yang dibentuk oleh PIHAK PERTAMA.

(3) PIHAK KEDUA diharuskan MENYIAPKAN SEMUA DOKUMEN/BUKTI kemajuan pelaksanaan penelitiannya guna kepentingan monev.

(4) Waktu pelaksanaan monev akan ditentukan oleh PIHAK PERTAMA.

KOLOKIUM LAPORAN PENELITIAN

Pasal 9

(1) PIHAK KEDUA wajib menyerahkan **Laporan Penelitian Sementara** sebagai bahan kolokium selambat-lambatnya **8 Oktober 2019.**

(2) Ketua Peneliti wajib hadir dan mempresentasikan hasil penelitiannya pada kolokium **Laporan Penelitian Sementara** yang pelaksanaannya akan diatur oleh PIHAK PERTAMA.

(3) Revisi laporan penelitian yang sudah dikolokiumkan harus mendapatkan pengesahan dari *reviewer* dalam bentuk **Surat Pernyataan** dan dijilid dalam satu kesatuan laporan penelitian.

LAPORAN AKHIR PENELITIAN

Pasal 10

(1) PIHAK KEDUA wajib menyerahkan **Laporan Akhir Penelitian** selambat-lambatnya **2 (dua) pekan** setelah dikolokiumkan.

(2) Sistematika dan format laporan penelitian mengacu pada ketentuan dalam Pedoman Penelitian yang dikeluarkan oleh LPPM dan ketentuan lain yang berlaku.

(3) Berkas Laporan Akhir Penelitian yang diserahkan kepada PIHAK PERTAMA harus dilampiri:
   (a) artikel/draft publikasi ilmiah;
   (b) naskah/draft seminar (prosiding) dan sertifikat seminar;
   (c) lampiran lain yang dianggap perlu (seperti angket atau lainnya);
   (d) Profil Penelitian;
   (e) Borang Capaian Luaran Penelitian;
   (f) Form Pembimbingan (khusus skema PDP)
   (g) Daftar hadir kolokium laporan penelitian; dan
   (h) produk penelitian (naskah buku ajar, modul, naskah akademik, dan sejenisnya) atau dokumentasi/fotonya jika produk penelitian berupa barang atau perangkat keras *(hardware)* yang disertai penjelasan ringkas alat dan petunjuk pemakaiannya.

   Komponen (a) sampai dengan (g) dijilid dalam satu kesatuan sebagai berkas laporan akhir penelitian.

   Komponan (h) dijilid terpisah dari berkas laporan akhir penelitian, kecuali dokumentasi/foto produk penelitian.

(4) Laporan Akhir Penelitian sebagaimana tersebut pada ayat (1), (2), dan (3) memenuhi ketentuan sebagai berikut:
   a. bentuk/ukuran kertas A4;
   b. warna cover sesuai ketentuan;
   c. di bawah bagian cover ditulis:

PENELITIAN INI DILAKSANAKAN ATAS BIAYA
ANGGARAN DAN PENDAPATAN DAN BELANJA UNIVERSITAS AHMAD DAHLAN
TAHUN AKADEMIK 2018/2019
NOMOR KONTRAK: PF-133/SP3/LPPM-UAD/IV/2019

(5) Berkas Laporan Akhir Penelitian sebagaimana tersebut dalam ayat (1) diserahkan kepada PIHAK PERTAMA sebagai berikut.
   1 eksemplar **ASLI** untuk PIHAK PERTAMA;
   1 eksemplar untuk PIHAK KEDUA;
   1 eksemplar untuk arsip Program Studi;

(6) PIHAK KEDUA wajib mengunggah file laporan akhir penelitian secara lengkap pada alamat *http://www.simpel.uad.ac.id* melalui akun portal ketua peneliti dengan format file PDF.

KEWAJIBAN UNGGAH LAPORAN PADA PORTAL UAD

Pasal 11

(1) PIHAK KEDUA wajib mengunggah berkas Laporan Akhir Penelitian pada *www.portal.uad.ac.id* melalui akun portal masing-masing peneliti.
(2) Berkas Laporan Akhir Penelitian sebagaimana dimaksud pada ayat (1) yang terdiri dari:
   i. Abstrak (PDF).
   ii. Laporan Akhir Final (PDF).
   iii. Profil Penelitian (PDF).
   iv. Borang Capaian Luaran Penelitian (PDF).

SANKSI DAN PEMUTUSAN PERJANJIAN PENELITIAN

Pasal 12

(1) PIHAK PERTAMA berhak memberikan peringatan dan atau teguran atas kelalaian dan atau pelanggaran yang dilakukan oleh PIHAK KEDUA yang mengakibatkan tidak dapat terpenuhinya kontrak penelitian ini.
(2) PIHAK PERTAMA berhak melakukan pemutusan perjanjian penelitian, jika PIHAK KEDUA tidak mengindahkan peringatan yang diberikan oleh PIHAK PERTAMA.
(3) Segala kerugian material maupun finansial yang disebabkan akibat kelalaian PIHAK KEDUA, maka sepenuhnya menjadi tanggungjawab PIHAK KEDUA.
(4) Jenis sanksi yang diberikan dapat berupa:
   (a) tidak diperkenankannya mengajukan proposal penelitian pada tahun anggaran berikutnya sampai kewajibannya terselesaikan; dan atau
   (b) tidak dapat mencairkan dana tahap 2; dan atau
   (c) mengembalikan dana yang telah diterima oleh PIHAK KEDUA.

KEADAAN MEMAKSA (*FORCE MAJEUR*)

Pasal 13

Ketentuan dalam Pasal 10 tersebut di atas tidak berlaku dalam keadaan sebagai berikut:

a. Keadaan Memaksa (*force majeur*)
b. PIHAK PERTAMA menyetujui atas terjadinya keterlambatan yang didasarkan pada pemberitahuan sebelumnya oleh PIHAK KEDUA kepada PIHAK PERTAMA dengan **surat pemberitahuan** mengenai kemungkinan terjadinya keterlambatan dalam penyelesaian kegiatan penelitian sebagaimana dimaksud dalam Pasal 1 dan Pasal 3; dan sebaliknya PIHAK KEDUA menyetujui terjadinya keterlambatan pembayaran sebagai akibat keterlambatan dalam penyelesaian perjanjian penelitian.

Pasal 14

(1) Keadaan Memaksa (*force majeur*) sebagaimana yang dimaksud dalam Pasal 11 ayat (1) adalah peristiwa-peristiwa yang secara langsung mempengaruhi pelaksanaan perjanjian serta terjadi di luar kekuasaan dan kemampuan PIHAK KEDUA ataupun PIHAK PERTAMA.
(2) Peristiwa yang tergolong dalam keadaan memaksa (*force majeur*) antara lain berupa bencana alam, pemogokan, wabah penyakit, huru-hara, pemberontakan, perang, waktu kerja diperpendek oleh pemerintah, kebakaran dan atau peraturan pemerintah mengenai keadaan bahaya serta hal-hal lainnya yang dipersamakan dengan itu, sehingga PIHAK KEDUA ataupun PIHAK PERTAMA terpaksa tidak dapat memenuhi kewajibannya.
(3) Peristiwa sebagaimana dimaksud pada ayat (2) tersebut di atas, wajib dibenarkan oleh penguasa setempat dan diberitahukan dengan Surat oleh PIHAK KEDUA atau PIHAK PERTAMA kepada PIHAK PERTAMA atau PIHAK KEDUA selambat-lambatnya 7 (tujuh) hari sejak terjadinya peristiwa yang dikategorikan sebagai Keadaan Memaksa (*force majeur*).

(4) PIHAK PERTAMA memberikan kesempatan kepada PIHAK KEDUA untuk menyelesaikan perjanjian kontrak ini sampai pada batas waktu yang disepakati oleh kedua belah pihak jika keadaan *force majeur* dinyatakan telah selesai.

PENYELESAIAN PERSELISIHAN

Pasal 15

(1) Apabila dalam pelaksanaan perjanjian dan segala akibatnya timbul perbedaan pendapat atau perselisihan, PIHAK PERTAMA dan PIHAK KEDUA setuju untuk menyelesaikannya secara musyawarah untuk mencapai mufakat.

(2) Apabila penyelesaian sebagaimana termaksud dalam ayat (1) di atas tidak tercapai, maka PIHAK PERTAMA dan PIHAK KEDUA sepakat menyerahkan perselisihan tersebut melalui mediasi dengan Rektor sebagai atasan langsung dari PIHAK PERTAMA yang putusannya bersifat final dan mengikat.

PENGUNDURAN DIRI

Pasal 16

(1) Apabila PIHAK KEDUA mengundurkan diri atau membatalkan SP3 ini, maka PIHAK KEDUA wajib mengajukan Surat Pengunduran Diri yang ditujukan kepada PIHAK PERTAMA.

(2) Surat Pengunduran Diri sebagaimana dimaksud pada ayat (1) wajib disahkan oleh Dekan fakultas ketua peneliti yang bersangkutan; dan bagi peneliti skim PDP ditambah persetujuan Dosen Pembimbing.

(3) PIHAK KEDUA wajib mengembalikan dana yang telah diterima kepada PIHAK PERTAMA

LAIN-LAIN

Pasal 17

(1) Hal-hal yang dianggap belum cukup dan perubahan-perubahan perjanjian akan diatur kemudian atas dasar permufakatan kedua belah pihak yang akan dituangkan dalam bentuk Surat atau Perjanjian Tambahan (*addendum*), yang merupakan kesatuan dan bagian yang tidak terpisahkan dari perjanjian awal.

(2) Pemberitahuan dan/atau surat menyurat dari PIHAK KEDUA kepada PIHAK PERTAMA dialamatkan kepada Kepala Lembaga Penelitian dan Pengembangan Universitas Ahmad Dahlan.

Pasal 18

(1) Surat Perjanjian Pelaksanaan Penelitian (SP3) ini berlaku sejak ditandatangani dan disetujui oleh kedua belah pihak.

(2) Surat Perjanjian Pelaksanaan Penelitian (SP3) ini dibuat rangkap 2 (dua); bermeterai cukup pada kedua belah pihak; dan masing-masing memiliki kekuatan hukum yang sama. Biaya meterai dibebankan kepada PIHAK KEDUA.

PIHAK PERTAMA,	PIHAK KE DUA,
Dr. Widodo, M.Si.	**Farid Ma'ruf, S.T., M.Eng.**
NIP: 19600221198709101	NIP/NIY.

HASIL CEK1_60181170

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Analysis of Situational Awareness for Online Taxibike Driver in Yogyakarta Using QUASA Analysis

Farid Ma'ruf[1*], Hapsoro Agung Jatmiko[2#]

Abstract. *Online taxibike service has its own charm because it is a new breakthrough for current conditions that make it easy for consumers to order a vehicle. Riding a motorcycle is an activity that requires awareness against road conditions that are dynamic and can change in seconds. This study aims to determine the level of awareness of online taxibike driver when using a GPS and non GPS. The method used in this research is the QUASA method which combines the probing method in the situational awareness process with the self rating method. The results of data processing obtained that the value of actual accuracy and perceived accuracy when online taxibike driver uses a GPS is greater than non GPS. In addition, other results stated that the level of awareness of online taxibike driver when using a GPS was 4.7% greater than when without non GPS.*

Keywords: QUASA; Situational Awareness; Online Taxibike Service; Signal Detection Theory, Alertness Level

I. Introduction

Transportation, is one of the most important things for people nowadays, furthermore in Indonesia (Aminah, 2006; Sutardi & Martina 2012; Kadarisman et al, 2015). The needs to move freely yet as fast as we can, have changed the type and face of businesses model in transportation section. Technology become the most disruption point, even in transportation model, with the rise of application based business, even in transportation have become the most favourable point for customers, compared to the old conventional means of transportation, such as ojek pengkolan, conventional taxi drives and so on. Customers tend to choose the application based transportation compared to the old one, because of it's easiness, moreover they offer cheaper fare compared to the old one (Hariyatno et al 2018).

On 2017, it was recorded that, there are at least 1.5 Million active users in Indonesia which known using the online taxibike services (Bohang, 2017), thus it shown that many people in Indonesia are started to find ease and comfort in using online transportation methods including the online taxibike (Hariyatno et al, 2018).

Indonesian Government have already stated that, every person whom riding any kinds of transportation vehicles are obliged to drive the vehicle in a full concentration and in a

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Submitted: 27-02-2020 Revised: xx-0x-2020

Accepted: xx-0x-2020

good manner (Undang-Undang no 22, 2009, Pasal 106, Ayat 1), which means, that will be a problem for the online taxibike drivers, that divert their attention to their gadget, whilst checking their ordering status of their taxibike account.

By the end of 2013, there are at least 168.174 road accident that happened in Indonesia (Djaja et al 2016), motorcycles are dominating most cases with 119.550 accidents. Most of the accidents, are collision type one, dominating in a huge 65% cases (Saputra, 2016).

Driving, is a strenuous activity that requires both physical and mental work, while the goal of driving itself, is by going to another destination safely (Mustapha et al, 2016). Driving in the streets, basically will increasing the stress level of the driver (SchieBl, 2006), starting from the harsh environment (heat or even rain), the abilities of the driver itself, traffic condition, to unpredicted road condition will decrease the concentration of the driver. One of the main concerns while driving is the Situational Awareness (SA) of the driver. SA, is a condition which the driver could esasily perceived the surrounding condition, and could easily detect what s/he must do in that condition (Endsley & Garland, 2000; Endsley, 1995; Endsley, 1993). According to the situational awareness model in driving, we could break down the level into 3 (Michon, 1985; Bernotat, 1970; Rasmussen, 1983; Schomig & Metz, 2012), namely : operational, tactical and strategic. In order to survive the unstable condition on the road, drivers need to fully understand the three level of SA.

One of the method to measure and evaluate the level of Situational Awareness, is "Quantitative Analysis of Situational Awareness" or QUASA. QUASA is a combination of several evaluation method in situational awareness, it combined the probing method in the classical situational awareness and adding the self-rating process of which the drivers answer (McGuiness, 2004). This method is done by giving queries or questions regarding the condition while driving, including the True/False questions in order to find how sure the drivers with their own answers. (McGuiness, 2004).

II. Research Methodology

This research was conducted in two major way, the first method was collecting the demographics data of the respondents. The respondents of this research are the online taxibike drivers in Yogyakarta. Following the demographics questionnaire, the next step of the research is the QUASA questionnaire, that will be distributed to the same respondents, which are the online taxibike drivers.

The Demographics questionnaire, contains the questions related to the driver's experience regarding their skills, whilst the second questionnaire, QUASA, contains the questions of the situational awareness condition of the drivers.

Using the demographics data, collected from the questionnaire, the route of the simulation for the situational awareness test is determined. There will be two (2) models of simulation, the first model asking the drivers to use the online map (application) while driving, whilst the second one asking the drivers to drive without the online map.

Based on the data from the QUASA questionnaire, the data then will be processed with several tools, in order to find how the level of the SA of the respondent on both model mention above.

III. Result and Discussion

Research Overview

This research was conducted in Yogyakarta, with 30 online taxibike driver as it's respondent. The drivers will first be

briefed about the current research, including the model of the research, the questionnaire that should be filled, and the route that should be taken. This research is not limiting in several companies in taxibike driver, but the time of which the data taken, will be specified in order to prevent any misinterpretation of the data.

There are 2 questionnaire thay being used in this research, namely : a) Demographic Questionnaire, b) QUASA Questionnaire. The demographic questionnaire is being used in order to find the personal data, including their length of time being an online taxibike driver. Using this questionnaire, the researchers then determine the route of the experiment that will be used in both model. The route of the experiment itself will take 31 minutes or equals to 11 km.

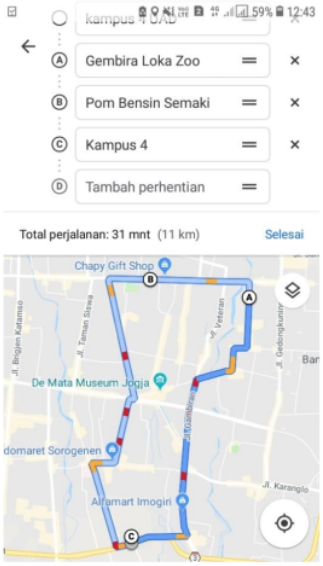

Figure 1 Route of the Simulation

Based on the route created, the QUASA questionnaire then being used in two models. This models is chosen by the researcher, in order to compare both situation that being implemented to the respondent. The two (2) conditions that being compared are namely : a) GPS situation b) Non-GPS situation. On the first simulation model, the respondent needs to fully follow the instructions given by the GPS, along the way, the respondent will be asked with several questions related to the current situation in the road. The questions will be used as a gauge of the driver on how high their SA level. The research itself will only using two (2) levels of SA namely : Perception and Comprehension. Moving onto the second model, or the non-GPS situation, is basically having the same treatment and route regarding the simulation. The major difference of the first and second model is the absence of the GPS. Drivers needs to go to the same main goal, without the assistance of the GPS.

Using the second data collected from the QUASA questionnaire, researchers are going to classify the level of the SA by using the Signal Detection Theory (SDT). SDT is a model which illustrate how a person doing their task based on the stimuli they receive (McGuiness, 2004). Basically, SDT classify the probability of responses of which someone having when doing several job namely : hit, false alarm, miss, correct rejection (McGuiness, 2004)

The main goal on this research is concerning and finding the difference of using GPS while driving and not using GPS for online taxibike driver.

Calibrating the Situational Awareness

Several steps needs to be done, in this research to obtain the main goal. The first step is by doin the Calibration in Situational Awareness. This step is used in order to find the comparison between actual accuracy and

perceived accuracy. Based on the model that being created, there will be 2 types of confidence level that will being shown in Table 1 and 2 below.

Table 1 Confidence Level without GPS Scenario

Respondent	Confidence Level
No. 1	19
No. 2	14.6
No. 3	16.8
No. 4	15.4
No. 5	15.2
No. 6	15
No. 7	12.4
No. 8	15.4
No. 9	19.4
No. 10	17.4
No. 11	14
No. 12	17
No. 13	15.8
No. 14	16.2
No. 15	14
No. 16	0
No. 17	20
No. 18	20.8
No. 19	21
No. 20	19.8
No. 21	21.6
No. 22	21.4
No. 23	19.8
No. 24	22
No. 25	20
No. 26	21.2
No. 27	19.8
No. 28	21.2
No. 29	19.6
No. 30	0

Confidence level shown in Table 1, will be the perceived accuracy of the drivers. In order to find the comparison between the actual and perceived accuracy, we need first to use the mathematical formulation shown in (1).

$$\sum \text{Score} = \sum \text{Questions X} \sum \text{Respondent X } 100\% \quad ...(1)$$

Using (1), thus we could find the total score answered by the respondent

Total Score (1st Scene) = 22X 30X100%

= 660

While both Actual and Perceived Accuracy can be found using the mathematical formulation shown in (2) and (3)

$$\text{Actual Accuracy} = \frac{\sum \text{Questions Answered Correct}}{\sum \text{Score}} \text{X } 100\% \quad ....(2)$$

$$\text{Perceived Accuracy} = \frac{\sum Confidence\ Level}{\sum Score} X\ 100\% \quad ....(3)$$

Using (2) and (3), we could find both score shown below.

$$\text{Actual Accuracy} = \frac{353}{660} X\ 100\%$$

$$= 0.5348 \approx 53{,}48\%$$

Perceived Accuracy = $\frac{506,4}{660} X\ 100\%$

= 0.7672 ≈ 76.72%

Following the first model, next step that should be done is finding the comparison in the second model, namely the "GPS Simulation" model. Using the same steps done in the previous model, it is shown in Table 2, regardless of the confidence level of the respondents while doing the simulation.

Table 2 Confidence Level with GPS Scenario

Respondent	Confidence Level
No. 1	15.2
No. 2	13
No. 3	15
No. 4	19
No. 5	16
No. 6	15.8
No. 7	15.8
No. 8	15.2
No. 9	14.6
No. 10	18.4
No. 11	18.2
No. 12	15
No. 13	18.2
No. 14	18.2
No. 15	15.4
No. 16	0
No. 17	21
No. 18	20.8
No. 19	21.2
No. 20	18.8
No. 21	20.6
No. 22	20.8
No. 23	21.4
No. 24	21.6
No. 25	20.2
No. 26	20.4
No. 27	20.4
No. 28	21.6
No. 29	21
No. 30	0

Table 2 shown the perceived accuracy of the respondents, but in the second model, which the respondents are guided by the GPS in order to finish the simulation. Using (1), (2), and (3) we could find the comparison between both actual and perceived accuracy of the second model.

Total Score (2nd Scene) = 660

Actual Accuracy = $\frac{397}{660} X\ 100\%$

= 0.6015 ≈ 60.15%

Perceived Accuracy = $\frac{512.8}{660} X\ 100\%$

= 0.777 ≈ 77,7%

Following both results, we then could proceed into the next step which is finding the actual condition of the Situational Awareness of the respondents, by doing a calibration based on the results. The Calibration is basically finding how far could the persons decide the truth based on their

observation or decision (McGuiness, 2004), to put it simple, the calibration process is a method to find a conformity between their actual accuracy and self-perception/perceived accuracy (Koriat & Goldsmith, 1996). The Calibration process, basically is divided into two (2) big region, namely: a) Over-Confident Condition b) Under-Confident Condition (McGuiness, 2004). Based on the research's results on both models shows us, that the drivers are in over-confident conditions, which means that drivers tend to believe that they have correctly answer the questions or could comprehend the current situation, but in contrast, most of the answers were not right, hence drivers are in over-confident condition, which are shown in both Figure 2 and Figure 3.

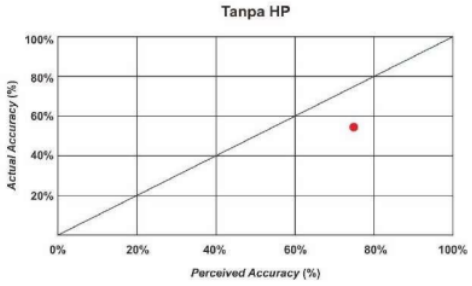

Figure 2 Calibration Curve of Non-GPS Scenario

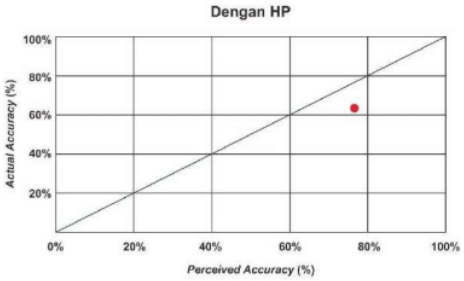

Figure 3 Calibration Curve of GPS Scenario

Over-Confidence condition is a situation which the calibration point/dot, falls below the calibration line. On both cases, it indicates that drivers in both simulation models could not fully understand their surrounding, yet believing that what they have done are correct. This kind of condition, is a problem in a driving condition, which could lead to fatal accident due to their negligence on the road.

Alertness Level

Alertness level, refers to how driver's cognition while driving on the road. Based on the three level of SA (Endsley, 1995), we could relate the alertness level with how their attitude while driving. Alertness level, can be found by multiplying the confidence level answer with the correct answer, shown in (4)

$$Alertness\ level = \frac{Confidence\ Level\ X\ Correct\ Answers}{\sum Total\ Score} \quad \ldots (4)$$

Based on (4), it is imperative to know score of the confidence level multiplied by the correct answers, in this case shown in Table 3 and Table 4.

Table 3 Confidence Level Multiplied by

Correct Answers in Non-GPS Scenario

Respondent	Confidence Level X Numbers of Answer Correct Score
No. 1	10.2
No. 2	8.8
No. 3	9.4
No. 4	6
No. 5	7
No. 6	11.4
No. 7	6.2
No. 8	8
No. 9	9
No. 10	10.8
No. 11	8.4
No. 12	10.4
No. 13	10.2
No. 14	6.4
No. 15	6.8
No. 16	0
No. 17	15.4
No. 18	14.2
No. 19	12.6
No. 20	13.8
No. 21	14.8
No. 22	14.4
No. 23	15.4
No. 24	16
No. 25	11.2
No. 26	13
No. 27	10.8
No. 28	13.6
No. 29	10.4
No. 30	0
Total Scores: 304.6	

Based on Table 3, and using the formulation on (4), we could find out the alertness level of the drivers in the first scenario model.

Alertness Level (Non-GPS Scene)

$= \frac{304.6}{660}$

$= 0.4615 \approx 46.15\%$

Table 4 Confidence Level Multiplied by Correct Answers in GPS Scenario

Respondent	Confidence Level X Numbers of Answer Correct Score
No. 1	10.2
No. 2	7.6
No. 3	7.4
No. 4	13
No. 5	8.8
No. 6	9.6
No. 7	11
No. 8	9.4
No. 9	8.4
No. 10	13.8

Respondent	Confidence Level X Numbers of Answer Correct Score
No. 11	14
No. 12	8
No. 13	12.4
No. 14	15.6
No. 15	7.4
No. 16	0
No. 17	13.6
No. 18	15.2
No. 19	14.2
No. 20	12
No. 21	13
No. 22	11.8
No. 23	14.6
No. 24	14
No. 25	12.8
No. 26	12.6
No. 27	15.4
No. 28	15.6
No. 29	14.2
No. 30	0
Total Scores: 335.6	

Based on data shown in Table 4 and the formulation on (4), we could find out the alertness level in the GPS Scenario (second scenario model).

Alertness Level (GPS Scene)

$= \frac{335.6}{660}$

$= 0.5085 \approx 50.85\%$

Following the result of the Alertness level on both models, surprisingly drivers had a higher alertness level while driving in the GPS model rather than without the GPS. Although insignificant, the difference on the Alertness level on both models shows that driving while using GPS, requires higher cognitive level, in order to avoid accidents, thus the GPS Scenario provide higher Alertness level.

7 Signal Detection Theory (SDT)

Signal Detection Theory (SDT), shows how accurate a person could describe and analyzing the current task that given (McGuiness, 2004). It is also to find how good the persons could distinguish a stimuli given to them. The better the persons to distinguish the stimuli, the lower their "miss rate". SDT could be easily breakdown into 4 phase, that is shown in Figure 4.

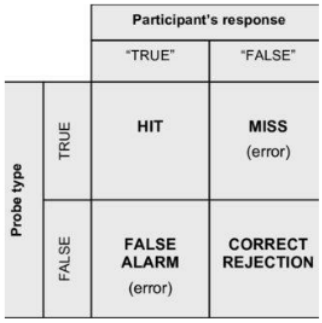

Figure 4 Signal Detection Theory Model (McGuiness, 2004)

Using the SDT model shown above, we could find the SDT level on both models, ran in this research. Using the formulation shown in (5), (6) (7) and (8), we could find the "Hit Rate", "Miss Rate", "False Alarm Rate"

"Correct Rejection Rate" in SDT.

$$Hit\ Rate = \frac{\sum Right\ Answers\ being\ Answered\ Correctly}{\sum Questions\ Answered\ Correctyly\ X\ \sum Respondent} \ldots(5)$$

$$Miss\ Rate = 1 - \text{hit rate} \ldots(6)$$

$$False\ Alarm\ Rate = \frac{\sum Wrong\ Answers\ being\ Answered\ Correctly}{\sum Questions\ Answered\ Falsely\ X\ \sum Respondent} \ldots(7)$$

$$Correct\ Rejection\ Rate = 1 - \text{False Alarm Rate} \ldots(8)$$

Based on the formulation written in (5), (6), (7), (8) we could predict the "Hit Rate", "Miss Rate", "False Alarm" and the "Correct Rejection Rate" in both model. The first result is the Non-GPS Model shown below.

Hit Rate Probablity (Non-GPS) = $\frac{197}{12X30}$

= 0.55

Miss Rate Probability = 1- Hit Rate

= 1 – 0.55

= 0.45

False Alarm Rate = $\frac{122}{10X30}$

= 0.41

Correct Rejection Rate = 1-False Alarm Rate

= 0.59

Following the formulation that have been found, we could create the contingency table in SDT, shown in Figure 5

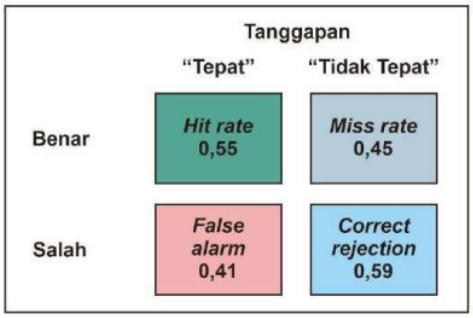

Figure 5 Contingency Table for Non-GPS Scenario

Using the same formulation in (5),(6), (7), and (8), we could then proceed to find the SDT for the second model.

Hit Rate Probablity (GPS Scenario) = $\frac{258}{12X30}$

= 0.72

Miss Rate Probability = 1- Hit Rate

= 1 – 0.72

= 0.28

False Alarm Rate = $\frac{139}{10X30}$

= 0.46

Correct Rejection Rate = 1-False Alarm Rate

= 0.54

Based on the formulation shown above, we could create the contingency table in SDT for the second model shown in Figure 6

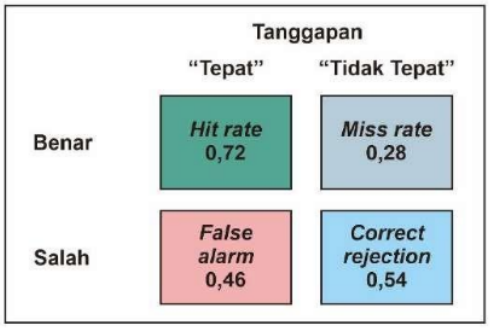

Figure 6 Contingency Table for GPS Scenario

Using both SDT table, we could proceed into the next step of the Situational Awareness analysis. Sensitivity (d'), shows how could a person could distinguish between signal and noise in SA condition. Sensitivity point is affected by bias responses, assumed this two conditions are fulfilled, namely : a) Signal and Noise are normally distributed b) both signal and noise have the same standard deviation (Stanislaw & Natasha, 1999), if one of both conditions are not fulfilled, the sensitivity point will not be affected by the bias responses. The Sensitivity Analysis for both scenarios are shown below.

Non-GPS Sensitivity Analysis Scenario

H0 = Respondent could distinguish the signal

H1 = Respondent could not distinguish the signal

α = 10%

d'= Z (Hit) – Z(False Alarm)

= Z(0.55) – Z(0.41) = 0.13 – (-0.22) = 0.45

Based on the formulation, we could plot it in the cartesian table, shown in figure 6

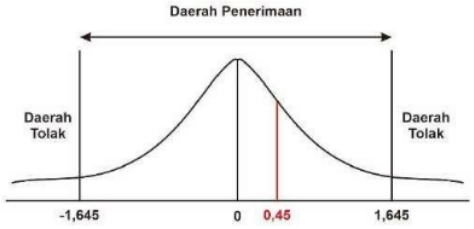

Figure 7 Sensitivity Analysis for Non-GPS Scenario

Figure 7, showed us that the sensitivity score is inbetween the rejection area, therefore we could assume that drivers could distinguish between noise and signal given in the simulation.

Following the Non-GPS scenario for the sensitivity analysis, we could create the same sensitivity analysis for the second model/GPS Scenario.

GPS Sensitivity Analysis Scenario

H0 = Respondent could distinguish the signal

H1 = Respondent could not distinguish the signal

α = 10%

d'= Z (Hit) – Z(False Alarm)

= Z(0.72) – Z(0.46) = 0.59 – (-0.10) = 0.69

Based on the formulation, we could also plot the result in cartesian table, shown in figure 8

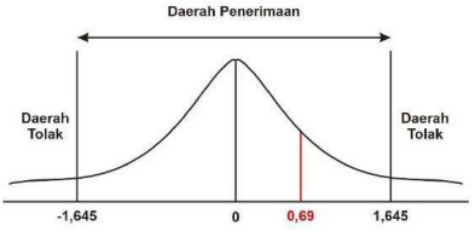

Figure 8 Sensitivity Analysis for GPS Scenario

Figure 8, showed us that the sensitivity score is inbetween the rejection area, therefore we could assume that drivers could distinguish between noise and signal given in the simulation.

Although there are no significant result in both model, surprisingly, the GPS scenario shows us that drivers could distinguish both signal and noise better (0.69 to 0.45), rather than the non-GPS scenario, which means, driving while following the instructions from the GPS will increase their concentration and SA condition.

IV. Conlusion

Most of the online taxibike driver in this research, are in over-confident region (shown in Fig 2 & Fig 3), which means that most of the drivers are thinking that they have ride in a good manner and could understand the route and also could comprehend the current situation on the street, while in fact, they are not driving in a good way. Surprisingly, the alertness level of the second model (GPS Scenario), shows that drivers tend to have higher alertness level (50.85%), although not much difference with the non-GPS level (46.15%). This could prove that somehow drivers tend to be more focused while using their online map/GPS. Another notes to take is that most of the drivers SDT analysis are in "hit" region, showing that even they drive, they could still understood their surrounding and could comprehend the current situation. Based on the SDT analysis, we could find the Sensitivity Analysis. It is found that both models shows that drivers could distinguish between signal and noise, although, in the GPS model provide the higher sensitivity level (0.69 to 0.45), which means that drivers are more capable to distinguish the noise while using the GPS.

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