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WORKSHOP AND TRAINING OF THE DRUG-DRUG INTERACTION DATABASE USING INDONESIAN DRUG BRAND NAMES

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Abstract: Indonesia International Institute for Life Sciences (i3L) and Lira Medika Hospital have developed a customized drug-drug interaction database, named as DDIBase. It has a comprehensive library for providing annotation-specific information toward the drug targets, mechanism, and interaction with other drugs. Hence, DDIBase is a new database with a brand-new user interface as well. In this regard, as DDIBase has currently reached beta stage of development, it is required to provide more comprehensive user feedback to improve its features. Thus, a workshop has been devised to explain the user guidelines, while a training has been conducted to provide system demo and user hand-on. The workshop and training attendees are faculty members of the i3L and Lira Medika Hospital Staffs. A survey has been developed to cater the user satisfaction toward the DDIBase. In this end, the survey has elicited good user satisfaction toward the developed user interface.

Keywords: drugbank; drug-drug interactions; drug database; website; web server

Abstrak: Indonesia International Institute for Life Sciences (i3L) dan Rumah Sakit Lira Medika telah mengembangkan basis data interaksi obat-obat yang dikostumisasi, yang dinamakan DDIBase. Basis data ini memiliki perpustakaan yang komprehensif untuk memberikan informasi anotasi khusus terhadap target obat, mekanisme, dan interaksi dengan obat lain. Oleh karena itu, DDIBase adalah basis data baru dengan antarmuka pengguna baru juga. Dalam hal ini, karena DDIBase saat ini telah mencapai tahap pengembangan beta, diperlukan umpan balik pengguna yang lebih komprehensif untuk meningkatkan fitur-fiturnya. Oleh karena itu, telah dirancang lokakarya untuk menjelaskan panduan pengguna, sementara pelatihan telah dilakukan untuk memberikan demo sistem dan praktik langsung pengguna. Peserta workshop dan pelatihan ini adalah dosen i3L dan Staf Rumah Sakit Lira Medika. Sebuah survei telah dikembangkan untuk memenuhi kepuasan pengguna terhadap DDIBase. Dalam hal ini, hasil survei telah menunjukkan kepuasan pengguna yang baik terhadap antarmuka pengguna yang dikembangkan

Kata kunci: drugbank; interaksi obat dengan obat; basis data obat; situs web; server web

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INTRODUCTION

Drug Database is necessary in the hospital to annotate the ongoing medical transaction of the patient. Most of the time, this system is catered for securing the monetary transaction of the hospital. However, as the hospital needs are growing, a new drug database system should be developed to cater that need. One of them is the development of a Drug-Drug Interaction database for annotating the medical record of the patients (Benoist et al., 2018).

This type of database is curated to annotate large amounts of data related with drug-drug interaction, such as drug targets, mechanism, and interaction with other drugs (Parikesit, Anurogo, & Putranto, 2017). Some database implementations have been devised for different optional needs, albeit they are having less customized options for fledging and growing hospitals (Kheshti, Aalipour, & Namazi, 2016). Some customization options are the development of a more user-friendly interface, customized drug-drug interaction data curation, machine learning extension, plug-ins integration, and expandable options (Mahdi, Ahmad, Natiq, Subhi, & Qassim, 2021; Parikesit, 2018). In this regard, a customizable database should be developed for this need.

Indonesia International Institute for Life Sciences (i3L) and Lira Medika hospital have developed a drug-drug interaction database prototype, called DDIBase, in this link https://ddi-cloud.i3l.ac.id/ that would require sign up for login into the system . It is already in the beta version, with a draft of guidelines and a help system already in place. The website was inspired from the previously developed system, and adapted accordingly with various local variations of APIs. DDIBase is ready for further beta testing with lay users, and ready to receive feedback for improvement.

So far, there are hardly any community service efforts in providing outreach for drug-drug interaction database in Indonesia, and the scope of the publications are still considered more catered for frontiers research (Andayani & Satibi, 2016; Bahar et al., 2020; Rahmawati, 2018). Most of the recorded specific publications on this field are from abroad (Nabovati et al., 2017; Raschi et al., 2015; Rivera, Shcherbakova, Vala, & Capoccia, 2020). In this regard, there is a need for providing a comprehensive report on the community outreach of DDIBase popularization in the scientific community. To cater that need, both i3L and Lira Medika hospital has conducted workshop and training of DDIBase for i3L faculty members, students, Lira Medika IT and pharmacy staff on 2nd of December 2021, 08.00 AM to 11.00 AM or based on the availability of the facilitators. Both activities were catered to gather user feedback toward the DDIBase. The workshop was conducted to familiarize the participants with the DDIBase documentation and help system. While the training was gathered to provide hand-on of the DDIBase system, as well as tutorials and problem solving.

The objective of this community service is to retrieve user satisfaction surveys toward the workshop and training of DDIBase. It is expected that the user feedbacks could assist in the further development of DDIBase

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METHOD

Community education and training: Both the workshop and training were attended by 26 participants, 9 of i3L and 17 of Lira Medika hospital. Both activities were following some steps that were considered standard in our community service pipeline as shown in Figure 1. Both the training and workshop were conducted online (Kenny & Pahl, 2005).

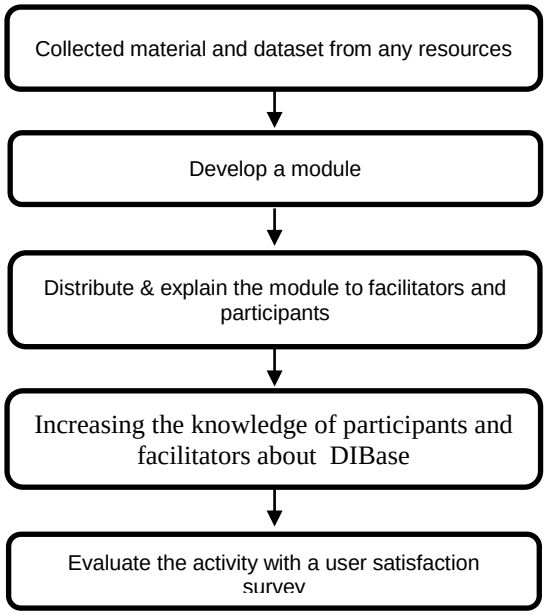

Figure 1: Flowchart of DDIBase community service of i3L and Lira Medika Hospital.

Each facilitator from i3L and Lira Medika hospital that involved in this CSR collaborated to hold both workshops and training for interested i3L faculty members and Lira Medika hospital staff. First, each facilitator agreed that the content for the workshop is based on the knowledge of DDIBase documentation, while the training will showcase the demo and tutorials of the database. Both events would aim to familiarize users to the features of DDIBase accordingly. Second, each facilitator collected any related material from related drug-drug interaction database resources. For example, demo of Medscape, MIMS, and other databases are possible for benchmarking purposes (Kheshti et al., 2016). Third, each facilitator developed related modules. Fourth, each facilitator distributed and explained the module to the participants. The final step will be CSR activity evaluation with i3L's standard user satisfaction survey based on a descriptive statistics instrument. There are mainly three issues that need to be addressed by the survey. The first, determining whether the DDIBase has addressed the user's needs accordingly. Second, determining whether the DDIBase is easy to use or not. Third, whether the users are eager to attend similar workshop and training in the future (Agustriawan et al., 2019; Saudale, Lerrick, Parikesit, & Mariti, 2019).

DISCUSSIONS

The workshop survey has a total of 26 respondents, while the training one has a total of 24 respondents. This event was started with workshop session at 8 am, which emphasized on the explanation about DDIBase guidelines and some basic theories (Figure 2).

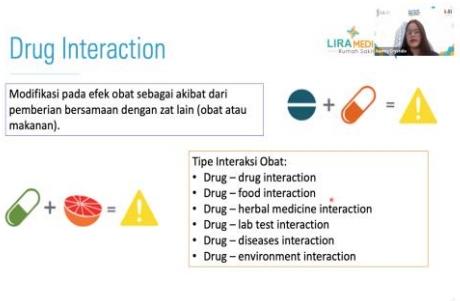

Figure 2 Our keynote speaker from i3L, ms. Audrey, was sharing the workshop material

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Thus, the users' experience on drug-drug interaction database is mixed, as 50% of respondents have used that database before, while the rest haven't (Figure 3).

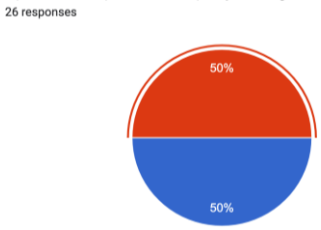

Figure 3 The pie chart for the respondents for the question of "have you ever learned about drug-drug interaction database before?". Orange part means 'Yes, I have'. Blue means 'Never'

Significant number of respondents have prior knowledge about database development, in 65.4% coverage (Figure 4). Then, interestingly, absolute majority of respondents (92.3%) agree that this workshop was excellent (Figure 5). Even the rest of the respondents still think that this workshop is good enough.

However, concerning the workshop level of difficulty, mixed results were obtained. Although most user agree that the difficulty is moderate (34.6%), there are some respondents that think this workshop is extremely difficult (23.1%) (Figure 6). This diverse result could be due to the difference of the academic background of respondents, and their familiarity with health informatics tools.

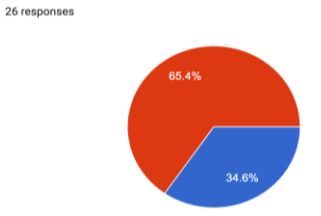

Figure 4 The pie chart for the respondents for the question of "Do you comprehend about database development prior to this workshop?". Orange part means 'Yes'. Blue means 'No'

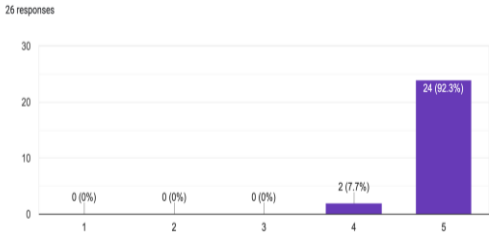

Figure 5 The box plot for the respondents of the question "what do you think about the execution today's workshop in general?" in Likert scale of 1 (very poor) to 5 (excellent)

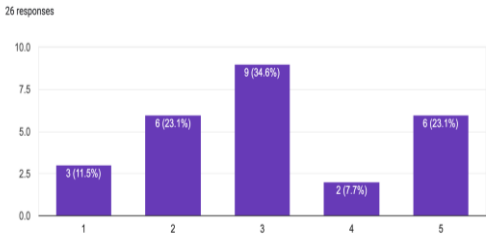

Figure 6 The box plot for the respondents of the question "what do you think about the level of difficulties for today's subject?" in likert scale of 1 (very easy) to 5 (extremely difficult)

However, regarding the subject mastery of the speaker, majority agrees that the speaker has excellent mastery (76.9%) while the rest still think it is good enough (Figure 7).

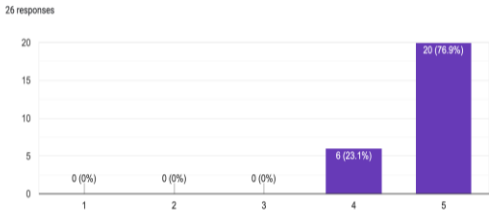

Figure 7 The box plot for the respondents of the question "What do you think about the explanation of the workshop instructror?" in likert scale of 1 (having no mastery of the subject) to 5 (excellent mastery of the subject)

Regarding the comprehension of respondents toward the hand-on, still absolute majority thinks that it is extremely helpful for them (80.8%) (Figure 8).

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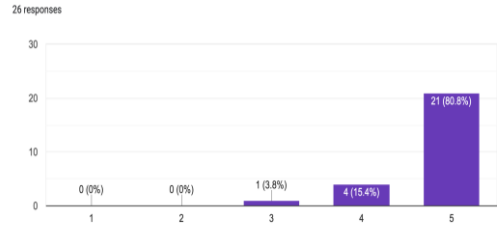

Figure 8 The box plot for the respondents of question "What do you think about the hand-on to comprehend the shared subject?" in likert scale of 1 (not helpful at all) to 5 (extremely helpful)

The last illustration about workshop session is the interest of participants to continue toward a more advance topic. Majority thinks that it should be progressed further to that level (73.1%) (Figure 9)

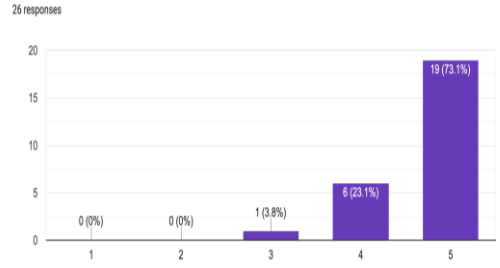

Figure 9 The box plot of respondents question "What do you think about DDIBase CSR workshop activity in general?" with likert scale of 1 (not interested in continuing) to 5 (Interested to progress further)

After half-an-hour, the training session started until 11 pm (Figure 10). It depicts a much more practical knowledge, and hand-on access to our DDIBase user interface.

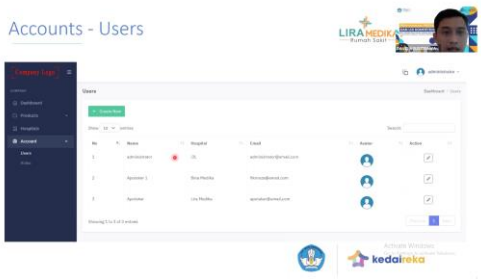

Figure 10 Our keynote speaker from i3L, Sir David, was sharing the training material

Then, it is also known that most participants (62.5%) already participated in drug-drug interaction database training before (Figure 11)

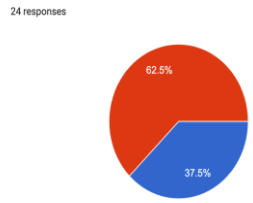

Figure 11 The pie chart of the respondents question "Have you trained in drug-drug interaction database before?".

Consistent with the workshop survey result, most respondents (54.2%) already obtained prior skill about database development (Figure 12)

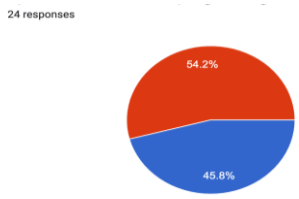

Figure 12 The pie chart of the respondents question "Do you understand the database development prior to this training?". Orange means "No", blue means "Yes"

Hence, the training already received excellent appraisal from most of the respondents (79.2%), while the rest still thinks that it is good enough (20.8%) (Figure 13).

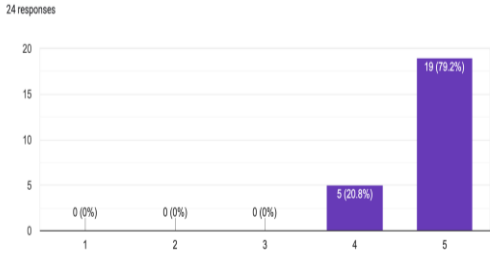

Figure 13 The box plot of respondents question "What do you think about today's training in general?" with likert scale of 1 (very poor) to 5 (Excellent)

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Consistent with the workshop survey, this training also elicited mixed result in question regarding subject's level of difficulty (Figure 14). Although most respondents think that this training is easy enough (33.3%), there are significant number that think it is extremely difficult (20.8%). The rest is split almost evenly to other criteria. The probable cause could be similar with the workshop survey result, albeit familiarity with health informatics tools may part dominant part because this training session is more technical than the workshop one.

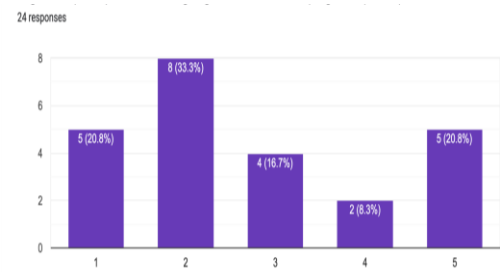

Figure 14 The box plot of respondents question "What do you think about the level of difficulty of today's subject?" with likert scale of 1 (very easy) to 5 (Extremely difficult)

Hence, the absolute majority of the respondents still think that the instructor's explanation is easy to understand and have complete mastery on the subject (87.5%) (Figure 15). The rest is believing that he has sufficient mastery.

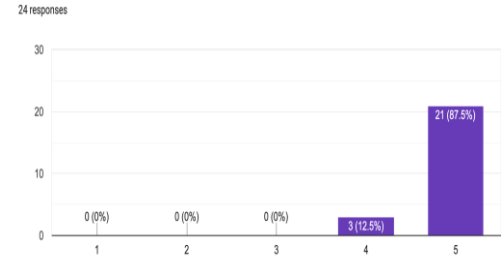

Figure 15 The box plot of respodents question "What do you think about the instructor's explanation today?" with likert scale of 1 (having no mastery at all) to 5 (having complete mastery)

Consistent with the workshop result, absolute majority (83.3%) of the respondents believe that the hand-on training is extremely helpful to them. The rest think that it is helpful enough (Figure 16).

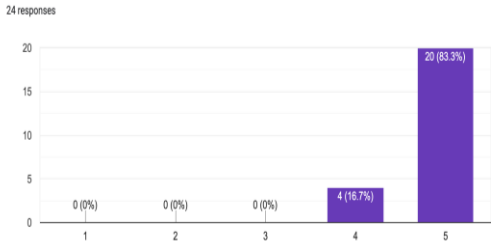

Figure 16 The box plot of respodents question "What do you think about today's hand-on to comprehend this subject?" with likert scale of 1 (Not helpful at all) to 5 (extremely helpful)

Lastly, absolute majority of the respondents (95.8%) are excited to continue the training with a more advanced feature (Figure 17).

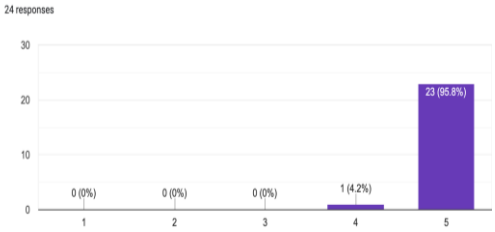

Figure 17 The box plot of respondents question "What do you think about this CSR DDIBase training activity in general?" with likert scale of 1 (not interested in continuing) to 5 (excited to continuing)

Although in general these workshops and training could be considered a success, as reflected in the survey result, there are some critical comments that should be considered to improve our DDIBase system, or the continuation of the next event. There is input to expect that the DDIBase should be pushed into the final release soon, so more features could be added. The font size is deemed too small by the users, so it should be ameliorated.

Moreover, there is a request to add system language in Indonesian, conducting benchmarking with the implementation of other hospitals, finalizing the interaction level, routinely adding useful features, and incorporating medical doctors as user. On the other side, users also praise the DDIBase user interface that enables pharmacists to check for the drug interaction data, and the demo was good enough. For future development, it was also suggested to add features to automatically check drug-drug interactions in current prescription with patients' medication history as well as to add recommendation in the drug-drug interaction alert to allow easier clinical decision making of the doctors and pharmacist.

CONCLUSION

The newly developed DDIBase prototype was ready to be launched for day-to-day application, and the beta version is ready for further deployment. Based on the current survey, the users are generally satisfied with the features of DDIBase and consider both the workshop and training as effective and useful for their professional development. In this end, the existing users base will serve as the nucleus for the further development and finalizing the professional version of DDIBase.

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