Evaluating design science research artefacts: A case of augmented AI

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DSR artefacts come in many forms, such as constructs, models, methods or frameworks and are intended to solve organisational problems [7]. For the purpose of this study, an artificial intelligence adoption framework (AIAF) is used as an example of an artefact. The AIAF was created as part of a larger study [18,19], of which this paper is part. People within organisations that are responsible for AI adoption interventions can use AIAFs to assist with their artificial intelligence adoption interventions [8,5]. As AI comprises of ever-evolving technologies [4,2], AI can be classified as a continuum [11]. The organisational

In an organisational setting, the person responsible for updating and maintaining the AIAF is the *AIAF owner*. The AIAF is updated and maintained to ensure it is still is valid and relevant. In a research setting, the content driver and owner of the framework is the researcher who is designing and improving the AIAF. Given this understanding, the AIAF owner is likely interested in reviewing feedback from the change managers and subsequently updating the AIAF. The review is covered in the \evaluation" of stage of Vaishnavi et al.'s design science research process model [21] and subsequently kicks o a new design cycle. Ailea facilitates gathering the feedback from the managers and presents it to the AIAF owner.

2.2   Use case and features

The AI adoption EA use case allows for four main features. Figure 1 graphically depicts the interaction between the framework owner, the change manager and Ailea. The rst feature allows the AIAF owner to communicate the created artefact (AIAF) content via Ailea. The second feature allows Ailea to enable change managers to view the AIAF. Third, the change managers can provide feedback on the artefact via Ailea. The feedback regarding the framework results in unstructured text. In order to structure the feedback and allow for an augmented AI solution, Ailea utilises topic modelling. Topic modelling is a natural language processing (NLP) technique that groups similar themes and topics. A topic is a probability distribution over words, and the words with the highest probabilities describe the topic [6]. Lastly, Ailea presents the results of the topic modelling to
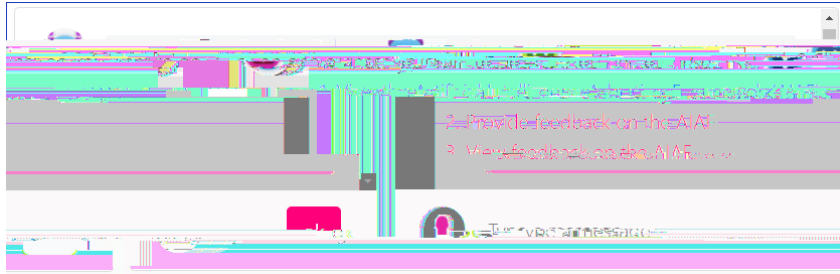
Fig. 2: Ailea chatbot facilitating the communication and review of an AIAF
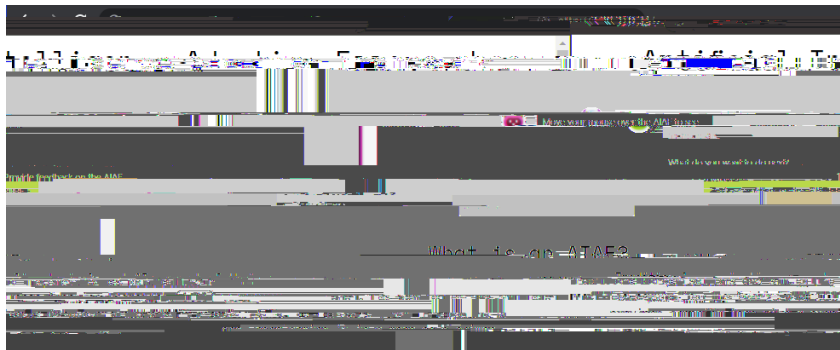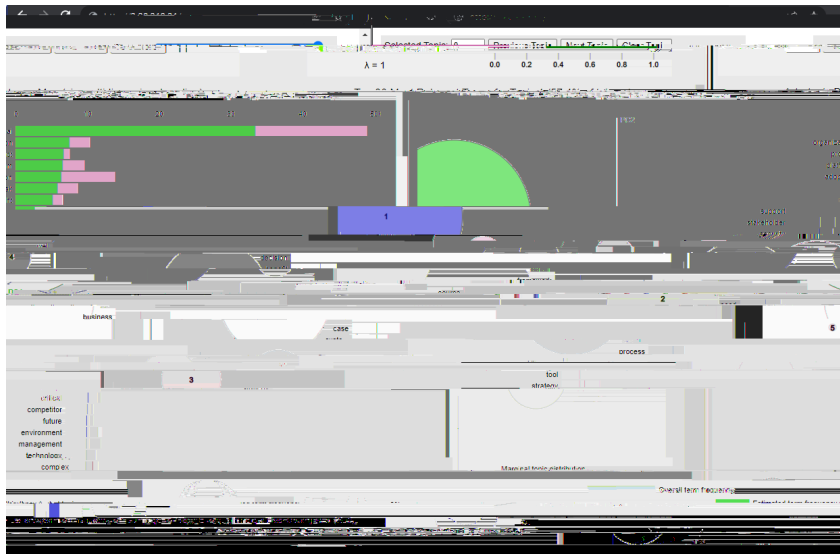

Fig. 3: A snippet of the AIAF as supported by Ailea

Fig. 4: Ailea making use of topic modelling to present the feedback

Ailea enables the change managers to submit feedback on the framework and speci cally prompts the change managers to comment on how to prevent a potentially oppressive environment as a result of implementing AI in organisations. The feedback's unstructured text data are stored in an SQLite database. Ailea reads the data and makes use of Gensim [14], an open-source Python library to apply topic modelling [12], a machine learning technique. The AIAF owner can then use the topics that emerges from the data to update and improve the framework. The topic modelling screenshot can be seen in Figure 4. The dominant topic for each feedback is shown next to the feedback title. The prototype can be found at the url: http://3.20.219.21/.

3   Signi cance to research

Design science research is a methodology that focuses on creating artefacts, but there is limited guidance on how to design for unexpected futures [13]. To support the continuous improvement of an artefact, in this case an arti cial intelligence adoption framework (AIAF) and allow for designing for a future that cannot be foreseen, an augmented AI emancipatory assistant was created. This prototype allows the researchers to explore using augmented AI to allow for evaluation and improvement of design science research artefacts.

4   Signi cance to practice

The prototype enables the e ective communication of an AIAF to people in practice as required in design science research [9]. Furthermore, it allows for practitioners to evaluate and provide feedback to the AIAF owner. The improvement process is supported by Ailea. The concept of Ailea can also be used to communicate and facilitate feedback on other DSR artefacts, for example an organisation can make use of Ailea to communicate an operations manual and enable multiple people in the organisation to provide feedback to the creator.

5   Evaluation of the artifact

To evaluate the use of Ailea, a small but knowledgeable group of managers from a global digital transformation industry leader were interviewed [3]. They were asked if, in their opinion, Ailea could help evaluate and improve artefacts in general. To this, they all responded `yes'. As motivation, their responses included: `Ailea provides wider inputs to the designer, with di erent views and interpretations.' This allows for continuous improvement' and `the topic modelling provides a holistic overview of all the opinions in a structured way'. Because Ailea prompts the person giving the feedback to consider the ethical impact of implementing AI, Ailea supports the prevention of an oppressive future.

6   Conclusion

From a design perspective, this study shows that augmented AI can support the evaluation and enhancement of DSR artefacts. Furthermore, given the potential that AI can have on human society [16], this paper also shows that the concept where AI can act as an EA to support humans in preventing an oppressive future is possible. Future studies can build on this simple concept and develop a more sophisticated solution to both support DSR and expand the possibilities of how AI can support humans against some of the dangers of implementing AI and also in the use of FRDR.

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