

BAB V

PENUTUP

5.1 Kesimpulan

Berdasarkan dari hasil penelitian yang telah dipaparkan, maka peneliti dapat menarik beberapa kesimpulan yaitu:

1. Telah dirancang aplikasi *chatbot* sebagai *digital assistant* untuk membantu Hubungan Masyarakat (Humas) Universitas Universal dalam menyampaikan informasi, serta membantu pengguna dalam memperoleh informasi yang dibutuhkan seputar *Frequently Asked Question* (FAQ) Universitas Universal.
2. Tingkat akurasi yang didapatkan dari model terlatih *loss* akhir mencapai 0.0003. Hasil dari pengujian kelayakan aplikasi didapatkan melalui penyebaran kuesioner kepada pengguna akhir setelah mereka menggunakan *chatbot*. Dalam pengujian ini, didapatkan sebanyak 33 pengguna akhir dan 1 staf Humas Universitas Universal diminta untuk mengisi kuesioner. Berdasarkan hasil pengujian kelayakan aplikasi, *chatbot* memperoleh skor akhir sebesar 86,72% dengan kategori sangat layak.

5.2 Saran

Berdasarkan hasil dalam penelitian ini, terdapat beberapa saran untuk penelitian selanjutnya:

1. Meluaskan ruang lingkup pembahasan, tidak hanya mencakup tentang *Frequently Asked Questions* (FAQ) atau informasi yang diperlukan ketika ingin mendaftar ke Universitas Universal, tetapi juga topik-topik

2. seperti prestasi dan kerja sama. Mengingat kemungkinan topik-topik tersebut juga dapat menjadi pertanyaan umum dari calon mahasiswa di masa depan.
3. Memperbanyak himpunan data dengan bahasa yang tidak baku, seperti bahasa-bahasa yang sering digunakan oleh anak muda.
4. Meningkatkan basis pengetahuan dan melatih *chatbot* dengan lebih banyak informasi mengenai Universitas Universal, agar *chatbot* dapat memberikan tanggapan yang lebih akurat.
5. Memberikan langkah-langkah atau skenario yang lebih spesifik dan terperinci dalam percakapan antara pengguna dan *chatbot*.
6. Menggunakan model yang terbaru dalam melatih himpunan data.
7. Menambahkan fitur *idle*, dimana jika pengguna *idle* selama beberapa waktu, maka layanan chatbot akan dihentikan untuk menutup percakapan.

DAFTAR PUSTAKA

- Arif, E., & Paulina Soko, I. (2022). The Evaluation of Web-Based and Android Face-to-Face Tutorial Applications Quality Using the User Acceptance Testing (UAT) Method. *Journal of World Science*, 1(8), 590–595.
<https://doi.org/10.36418/jws.v1i8.76>
- Arteaga, D., Arenas, J., Paz, F., Tupia, M., & Bruzza, M. (2019). Design of Information System Architecture for the Recommendation of Tourist Sites in the City of Manta, Ecuador Through a Chatbot. *Iberian Conference on Information Systems and Technologies, CISTI, 2019-June*(June), 19–22.
<https://doi.org/10.23919/CISTI.2019.8760669>
- Athota, L., Shukla, V. K., Pandey, N., & Rana, A. (2020). Chatbot for Healthcare System Using Artificial Intelligence. *ICRITO 2020 - IEEE 8th International Conference on Reliability, Infocom Technologies and Optimization (Trends and Future Directions)*, 619–622.
<https://doi.org/10.1109/ICRITO48877.2020.9197833>
- Chalwadi, R. (2022). *Chatbot for Providing College Information*. 09, 2064–2067.
- Chandra, Y. W., & Suyanto, S. (2019). Indonesian Chatbot of University Admission Using a Question Answering System Based on Sequence-to-Sequence Model. *Procedia Computer Science*, 157, 367–374.
<https://doi.org/10.1016/j.procs.2019.08.179>
- Chaudhuri, A. B. (2018). Flowchart and Algorithm Basics. In *2018 International Conference on Applied Information Technology and Innovation (ICAITI)* (Issue January 2016).
- Coulson, L., Jephson, B., Rob, L., Park, M., & Zburlea, M. (2019). *The HTML and*

CSS Workshop. Packt Publishing Ltd.

Duyen, L. T. M. (2022). *Design E-Commerce Website Integrating AI in Chatbot Automatic Message Replying System Graduation Thesis Summary. January*,

2017–2022. <http://thuvien.vku.udn.vn/handle/123456789/2017>

Dwi, A., Imamah, F., Andre, Y. M., & Ardiansyah. (2018). Aplikasi Chatbot (Milki

Bot) yang Terintegrasi dengan Web CMS untuk Customer Service pada UKM

MINSU. *Jurnal Cendikia, XVI,* 100–106.

[https://media.neliti.com/media/publications/277410-aplikasi-chatbot-milki-](https://media.neliti.com/media/publications/277410-aplikasi-chatbot-milki-bot-yang-terinteg-f6cf45cb.pdf)

[bot-yang-terinteg-f6cf45cb.pdf](https://media.neliti.com/media/publications/277410-aplikasi-chatbot-milki-bot-yang-terinteg-f6cf45cb.pdf)

Eisenstein, J. (2019). *Introduction to Natural Language Processing.* Britania Raya:

MIT Press.

[https://books.google.co.id/books?id=XGquDwAAQBAJ&printsec=frontcover](https://books.google.co.id/books?id=XGquDwAAQBAJ&printsec=frontcover&hl=id&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)

[r&hl=id&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false](https://books.google.co.id/books?id=XGquDwAAQBAJ&printsec=frontcover&hl=id&source=gbs_ge_summary_r&cad=0#v=onepage&q&f=false)

Fahmi, S., Purnamawati, L., Shidik, G. F., Muljono, M., & Fanani, A. Z. (2020).

Sentiment Analysis of Student Review in Learning Management System

Based on Sastrawi Stemmer and SVM-PSO. *Proceedings - 2020 International Seminar on Application for Technology of Information and Communication:*

IT Challenges for Sustainability, Scalability, and Security in the Age of Digital

Disruption, *iSemantic 2020,* 643–648.

<https://doi.org/10.1109/iSemantic50169.2020.9234291>

Firmansyah, Y., & Jamilah, J. (2018). Implementasi Sdlc Waterfall dalam

Pembuatan Game Edukasi Perjuangan Indonesia”Hisotira” Menggunakan Rpg

Maker Mv Berbasis Android. *Jurnal Khatulistiwa Informatika, 6(2),* 178–185.

<https://doi.org/10.31294/khatulistiwa.v6i2.162>

- Følstad, A., & Skjuve, M. (2019). Chatbots for Customer Service: User Experience and Motivation. *ACM International Conference Proceeding Series*. <https://doi.org/10.1145/3342775.3342784>
- Ghaithi, S. R. S. Al, & Ahmed, S. T. (2020). “Aistifsar” Enquiry Chatbot Using Artificial Intelligence Markup Language (AIML). *Journal of Student Research*, 1–10. <https://doi.org/10.47611/jsr.vi.1002>
- Ghazvininejad, M., Brockett, C., Chang, M. W., Dolan, B., Gao, J., Yih, W. T., & Galley, M. (2018). A Knowledge-Grounded Neural Conversation Model. *32nd AAAI Conference on Artificial Intelligence, AAAI 2018*, 5110–5117. <https://doi.org/10.1609/aaai.v32i1.11977>
- Gong, X., Kong, X., Zhang, Z., Tan, L., Zhang, Z., & Shao, B. (2019). Customer Service Automatic Answering System Based on Natural Language Processing. *ACM International Conference Proceeding Series*, 115–120. <https://doi.org/10.1145/3364908.3365286>
- Guntoro, Costaner, L., & Lisnawita. (2020). Aplikasi Chatbot untuk Layanan Informasi dan Akademik Kampus Berbasis Artificial Intelligence Markup Language (AIML). *Digital Zone: Jurnal Teknologi Informasi Dan Komunikasi*, 11(2), 291–300. <https://doi.org/10.31849/digitalzone.v11i2.5049>
- Gupta, A., & Hathwar, D. (2020). Introduction to AI Chatbots. *International Journal of Engineering Research And*, V9(07), 255–258. <https://doi.org/10.17577/ijertv9is070143>
- Hardeniya, N. (2015). NLTK Essentials. In *Odonatologica* (Vol. 44, Issue 4). Packt Publishing.
- Haristiani, N. (2019). Artificial Intelligence (AI) Chatbot As Language Learning

- Medium: An Inquiry. *Journal of Physics: Conference Series*, 1387(1).
<https://doi.org/10.1088/1742-6596/1387/1/012020>
- Hasugian, P. S. (2018). Perancangan Website sebagai Media Promosi dan Informasi. *Journal Of Informatic Pelita Nusantara*, 3(1), 82–86.
- Hia, E. P. D., Prestiadi, D., Maisyaroh, Maghfiroh, S. I., & Oktaviani, V. M. (2020). *The Use of Information and Communication Technology Through Website and Social Media as Public Relations Information Media*.
- Hormansyah, D. S., & Utama, Y. P. (2018). Aplikasi Chatbot Berbasis Web pada Sistem Informasi Layanan Publik Kesehatan di Malang dengan Menggunakan Metode TF-IDF. *Jurnal Informatika Polinema*, 4(3), 224.
<https://doi.org/10.33795/jip.v4i3.211>
- Hrushikesh Koundinya, K., Palakurthi, A. K., Putnala, V., & Kumar, A. K. (2020). Smart College Chatbot Using ML and Python. *2020 International Conference on System, Computation, Automation and Networking, ICSCAN 2020*.
<https://doi.org/10.1109/ICSCAN49426.2020.9262426>
- Irwanto. (2021). Perancangan Sistem Informasi Sekolah Kejuruan dengan Menggunakan Metode Waterfall (Studi Kasus SMK PGRI 1 Kota Serang-Banten). *Jurnal Pendidikan*, 12(2), 173–180. <http://www.ufrgs.br/actavet/31-1/artigo552.pdf>
- Janiesch, C., & Heinrich, K. (2021). *Machine Learning and Deep Learning*. 685–695.
- Jansen, R. H. (2015). Learning TypeScript. In *PhD Proposal* (Vol. 1).
- Jenneboer, L., Herrando, C., & Constantinides, E. (2022). The Impact of Chatbots on Customer Loyalty: A Systematic Literature Review. *Journal of Theoretical*

- and Applied Electronic Commerce Research*, 17(1), 212–229.
<https://doi.org/10.3390/jtaer17010011>
- Ketkar, N., & Moolayil, J. (2021). Deep Learning with Python: Learn Best Practices of Deep Learning Models with PyTorch, 2nd Edition. In *First*.
- Kochmar, E. (2022). *Getting Started with Natural Language Processing*. Manning Publications Co.
- Lalwani, T., Bhalotia, S., Pal, A., Bisen, S., & Rathod, V. (2018). Implementation of a Chat Bot System Using AI and NLP. *International Journal of Innovative Research in Computer Science & Technology*, 6(3), 26–30.
<https://doi.org/10.21276/ijircst.2018.6.3.2>
- Lira, B. I. (2020). *Analisis Kualitas Website Universitas Universal Menggunakan Metode Webqual 4.0*. UVERS: Program Studi Sistem Informasi.
- Mu'min, U. A. (2019). Peran Teknologi Informasi dalam Bidang Pendidikan (E-Education). *Al-Afkar, Journal for Islamic Studies*, 2(1), 104–113.
<https://doi.org/10.5281/zenodo.3554070>
- Muhyidin, A., Setiawan, M. A. F., & Nurkhamid. (2021). *Developing UNYSA Chatbot as Information Services about Yogyakarta State University*.
<https://doi.org/10.1088/1742-6596/1737/1/012038>
- Naga Lakshmi, K., Kishore Reddy, Y., Kireeti, M., Swathi, T., & Ismail, M. (2019). Design and Implementation of Student Chat Bot Using AIML and LSA. *International Journal of Innovative Technology and Exploring Engineering*, 8(6), 1742–1746.
- Nagpal, A., & Gabrani, G. (2019). Python for Data Analytics, Scientific and Technical Applications. *Proceedings - 2019 Amity International Conference*

- on Artificial Intelligence, AICAI 2019, 140–145.*
<https://doi.org/10.1109/AICAI.2019.8701341>
- Nur, H. (2019). Penggunaan Metode Waterfall dalam Rancang Bangun Sistem Informasi Penjualan. *Generation Journal*, 3(1), 1.
<https://doi.org/10.29407/gj.v3i1.12642>
- Paikari, E., & Van Der Hoek, A. (2018). A Framework for Understanding Chatbots and Their Future. *Proceedings - International Conference on Software Engineering*, 13–16. <https://doi.org/10.1145/3195836.3195859>
- Paszke, A., Lerer, A., Killeen, T., Antiga, L., Yang, E., Gross, S., Bradbury, J., Massa, F., & Steiner, B. (2019). *Pytorch: An Imperative Style, High Performance Deep Learning Library*. NeurIPS.
- Pratiwi, I. Y. R., Yahdi, I., & Rifki, Z. R. (2022). *Rancang Bangun Fitur Chatbot pada Website Politeknik Masamy Internasional*. 1(September), 22–27.
- Rakhra, M., Gopinadh, G., Addepalli, N. S., Singh, G., Aliraja, S., Reddy, V. S. G., & Reddy, M. N. (2021). E-Commerce Assistance With a Smart Chatbot Using Artificial Intelligence. *Proceedings of 2021 2nd International Conference on Intelligent Engineering and Management, ICIEM 2021*, 144–148.
<https://doi.org/10.1109/ICIEM51511.2021.9445316>
- Rebah, H. Ben, Boukthir, H., & Chédebois, A. (2021). Website Design and Development with HTML5 and CSS3. In *Website Design and Development with HTML5 and CSS3*. <https://doi.org/10.1002/9781119885122.fmatter>
- Rifano, E. J., Fauzan, A. C., Makhi, A., Nadya, E., Nasikin, Z., & Putra, F. N. (2020). Text Summarization pada Berita Bola Menggunakan Library Natural Language Toolkit (NLTK) Berbasis Pemrograman Python. *ILKOMNIKA*:

- Journal of Computer Science and Applied Informatics*, 2(1), 8–17.
<https://doi.org/10.28926/ilkomnika.v2i1.32>
- Robbins, J. N. (2018). *Learning Web Design a Beginner's Guide to HTML, CSS, JAVASCRIPT and Web Graphics*.
- Robi. (2022). *Perancangan dan Implementasi Aplikasi Vegetarian Berbasis Android*. Universitas Universal.
- Rosid, M. A., Fitriani, A. S., Astutik, I. R. I., Mulloh, N. I., & Gozali, H. A. (2020). Improving Text Preprocessing for Student Complaint Document Classification Using Sastrawi. *IOP Conference Series: Materials Science and Engineering*, 874(1). <https://doi.org/10.1088/1757-899X/874/1/012017>
- Sanjaya, A. E. (2019). *Pengembangan Chatbot Rekomendasi Pekerjaan dengan Pendekatan Natural Language Processing dan Metode Random Forest*. BINA NUSANTARA.
- Santoso, H. A., Saraswati, G. W., Rohman, M. S., Winarsih, N. A. S., Sukmana, S. E., Nugraha, A., Mulyanto, E., Rustad, S., & Firdausillah, F. (2018). Dinus Intelligent Assistance (DINA) Chatbot for University Admission Services. *2018 International Seminar on Application for Technology of Information and Communication*, 417–423.
- Sarker, I. H. (2021). Machine Learning: Algorithms, Real-World Applications and Research Directions. *SN Computer Science*, 2(3), 1–21.
<https://doi.org/10.1007/s42979-021-00592-x>
- Shalahuddin, M. (2021). *Rancang Bangun Media Promosi Oleh-Oleh Khas Sampit Berbasis Website*. 1(September), 126–133.
- Sharma, M., Joshi, S., Luthra, S., & Kumar, A. (2022). Impact of Digital Assistant

- Attributes on Millennials' Purchasing Intentions: A Multi-Group Analysis Using PLS-SEM, Artificial Neural Network and fsQCA. *Information Systems Frontiers*. <https://doi.org/10.1007/s10796-022-10339-5>
- Shivam, K., Saud, K., Sharma, M., Vashishth, S., & Patil, S. (2018). ChatBot for College Website. *International Journal of Innovative Technology and Exploring Engineering*, 8(10), 566–569. <https://doi.org/10.35940/ijitee.J8867.0881019>
- Udayan, D., B, D., Krishna, K. N., Reddy, T. S. H. M., & Dinesh, L. (2022). Conversational Chatbot for College Management Using LSTM. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4027039>
- Usnaini, M., Yasin, V., & Sianipar, A. Z. (2021). Perancangan Sistem Informasi Inventarisasi Aset Berbasis Web Menggunakan Metode Waterfall. *Jurnal Manajemen Informatika Jayakarta*, 1(1), 36. <https://doi.org/10.52362/jmijayakarta.v1i1.415>
- Wijaya, Y. S., Rahmaddeni, & Zoromi, F. (2020). Chatbot Designing Information Service for New Student Registration Based on AIML and Machine Learning. *JAIA - Journal of Artificial Intelligence and Applications*, 1(1), 01–10. <https://doi.org/10.33372/jaia.v1i1.638>
- Xiao, P. (2022). *Artificial Intelligence Programming with Python*. John Wiley & Sons, Inc. <https://www.ptonline.com/articles/how-to-get-better-mfi-results>
- Zendrato, M. L. V. (2022). Peningkatan Kualitas Pelayanan Keperawatan Menggunakan Personal Digital Assistant(PDA): Literatur Review. *Jurnal Ilmiah Permas: Jurnal Ilmiah STIKES Kendal*, 12 No 3(Juli), 719–724.