

Chatbot Design Features to Increase Productivity

Please note: This supplementary list of references represents the basis on which we derived design features throughout the paper. The consecutive numbering (1-72) in this document does not correspond to that in the references section of the Research in Progress paper.

1. An, S., Moore, R., Liu, E.Y., Ren, G.-J.: Recipient Design for Conversational Agents: Tailoring Agent's Utterance to User's Knowledge. In: Proceedings of the 3rd Conference on Conversational User Interfaces, pp. 1-5 (2021).
2. Ashktorab, Z., Jain, M., Liao, Q.V., Weisz, J.D.: Resilient chatbots: Repair strategy preferences for conversational breakdowns. In: Proceedings of the Conference on Human Factors in Computing Systems, pp. 1-12 (2019).
3. Ayedoun, E., Hayashi, Y., Seta, K.: Communication strategies and affective backchannels for conversational agents to enhance learners' willingness to communicate in a second language. In: Proceedings of the International Conference on Artificial Intelligence in Education, pp. 459-462 (2017).
4. Benke, I., Knierim, M.T., Maedche, A.: Chatbot-based emotion management for distributed teams: A participatory design study. In: Proceedings of ACM Human Computer Interaction, 1-30 (2020).
5. Benner, D., Elshan, E., Schöbel, S., Janson, A.: What do you mean? A Review on Recovery Strategies to Overcome Conversational Breakdowns of Conversational Agents. In: Proceedings of the 41st International Conference on Information Systems (ICIS) (2021).
6. Brandtzaeg, P.B., Følstad, A.: Chatbots: changing user needs and motivations. *Interactions* 25, 38-43 (2018).
7. Casas, J., Tricot, M.-O., Abou Khaled, O., Mugellini, E., Cudré-Mauroux, P.: Trends & Methods in Chatbot Evaluation. In: Proceedings of the International Conference on Multimodal Interaction, pp. 280-286 (2020).
8. Chattaraman, V., Kwon, W.-S., Gilbert, J.E., Ross, K.: Should AI-Based, conversational digital assistants employ social-or task-oriented interaction style? A task-competency and reciprocity perspective for older adults. *Computers in Human Behavior* 90, 315-330 (2019).
9. Chaves, A.P., Gerosa, M.: How should my chatbot interact? A survey on social characteristics in human-chatbot interaction design. *International Journal of Human-Computer Interaction* 37(8), 729-758 (2021).
10. De Cicco, R., Silva, S., Alparone, F.: "It's on its way": Chatbots applied for online food delivery services, social or task-oriented interaction style? *Journal of Foodservice Business Research* 24(2), 140-164 (2021).
11. De Vreede, T., Raghavan, M., De Vreede, G.-J.: Design Foundations for AI Assisted Decision Making: A Self Determination Theory Approach. In: Proceedings of the 54th Hawaii International Conference on System Sciences (HICSS) (2021).

12. Diederich, S., Brendel, A.B., Kolbe, L.M.: Designing anthropomorphic enterprise conversational agents. *Business & Information Systems Engineering (BISE)* 62(3), 193-209 (2020).
13. Diederich, S., Brendel, A.B., Lichtenberg, S., Kolbe, L.M.: Design for fast request fulfillment or natural interaction? Insights from an experiment with a conversational agent. In: *Proceedings of the 27th European Conference on Information Systems (ECIS)* (2019).
14. Dippold, D., Lynden, J., Shrubsall, R., Ingram, R.: Media: A turn to language: How interactional sociolinguistics informs the redesign of prompt: response chatbot turns. *Context & Media* 37 (2020)
15. Dyke, G., Howley, I., Adamson, D., Kumar, R., Rosé, C.P.: Towards academically productive talk supported by conversational agents. *Productive multivocality in the analysis of group interactions*, pp. 459-476. Springer Boston MA (2013).
16. Feine, J., Adam, M., Benke, I., Maedche, A., Benlian, A.: Exploring design principles for enterprise chatbots: An analytic hierarchy process study. In: *Proceedings of the International Conference on Design Science Research in Information Systems and Technology (DESRIST)*, pp. 126-141 (2020).
17. Feine, J., Gnewuch, U., Morana, S., Maedche, A.: A taxonomy of social cues for conversational agents. *International Journal of Human-Computer Studies* 132, 138-161 (2019).
18. Feng, S., Buxmann, P.: My virtual colleague: A state-of-the-art analysis of conversational agents for the workplace. In: *Proceedings of the 53rd Hawaii International Conference on System Sciences (HICSS)* (2020).
19. Fiore, D., Baldauf, M., Thiel, C.: "Forgot your password again?" acceptance and user experience of a chatbot for in-company IT support. In: *Proceedings of the 18th International Conference on Mobile and Ubiquitous Multimedia*, pp. 1-11 (2019).
20. Følstad, A., Brandtzæg, P.B.J.i.: Chatbots and the new world of HCI. *Interactions* 24(4), 38-42 (2017).
21. Gnewuch, U., Morana, S., Adam, M.T., Maedche, A.: Faster is not always better: understanding the effect of dynamic response delays in human-chatbot interaction. In: *Proceedings of the 26th European Conference on Information Systems (ECIS)* (2018).
22. Gnewuch, U., Morana, S., Maedche, A.: Towards Designing Cooperative and Social Conversational Agents for Customer Service. In: *Proceedings of the 38th International Conference on Information Systems (ICIS)* (2017).
23. Grover, T., Rowan, K., Suh, J., McDuff, D., Czerwinski, M.: Design and evaluation of intelligent agent prototypes for assistance with focus and productivity at work. In: *Proceedings of the 25th International Conference on Intelligent User Interfaces*, pp. 390-400 (2020).
24. Han, X., Zhou, M., Turner, M.J., Yeh, T.: Designing Effective Interview Chatbots: Automatic Chatbot Profiling and Design Suggestion Generation for Chatbot Debugging. In: *Proceedings of the Conference on Human Factors in Computing Systems*, pp. 1-15 (2021).
25. Heo, J., Lee, J.: CiSA: An inclusive chatbot service for international students and academics. In: *Proceedings of the International Conference on Human-Computer Interaction*, pp. 153-167 (2019).
26. Hornbæk, K., Hertzum, M.: Technology acceptance and user experience: A review of the experiential component in HCI. *ACM Transactions on Computer-Human Interaction* 24(5), 1-30 (2017).

27. Hu, Q., Lu, Y., Pan, Z., Gong, Y., Yang, Z.: Can AI artifacts influence human cognition? The effects of artificial autonomy in intelligent personal assistants. *International Journal of Information Management* 56 (2021).
28. Jain, M., Kota, R., Kumar, P., Patel, S.N.: Convey: Exploring the use of a context view for chatbots. In: *Proceedings of the Conference on Human Factors in Computing Systems*, pp. 1-6 (2018).
29. Jain, M., Kumar, P., Kota, R., Patel, S.N.: Evaluating and informing the design of chatbots. In: *Proceedings of the Designing Interactive Systems Conference*, pp. 895-906 (2018).
30. Janssen, A., Grützner, L., Breitner, M.H.: Why do Chatbots fail? A Critical Success Factors Analysis. In: *Proceedings of the 42nd International Conference on Information Systems (ICIS)* (2021).
31. Jiang, J., Ahuja, N.: Response quality in human-chatbot collaborative systems. In: *Proceedings of the 43rd International ACM SIGIR Conference on Research and Development in Information Retrieval*, pp. 1545-1548 (2020).
32. Khurana, A., Alamzadeh, P., Chilana, P.K.: ChatrEx: Designing explainable chatbot interfaces for enhancing usefulness, transparency, and trust. In: *Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing*, pp. 1-11 (2021).
33. Kimani, E., Rowan, K., McDuff, D., Czerwinski, M., Mark, G.: A conversational agent in support of productivity and wellbeing at work. In: *Proceedings of the 8th International Conference on Affective Computing and Intelligent Interaction*, pp. 1-7. (2019).
34. Klopfenstein, L.C., Delpriori, S., Malatini, S., Bogliolo, A.: The rise of bots: A survey of conversational interfaces, patterns, and paradigms. In: *Proceedings of the Conference on Designing Interactive Systems*, pp. 555-565 (2017).
35. Kvale, K., Sell, O.A., Hodnebrog, S., Følstad, A.: Improving conversations: lessons learnt from manual analysis of chatbot dialogues. In: *Proceedings of the International workshop on chatbot research and design*, pp. 187-200 (2019).
36. Li, C.-H., Chen, K., Chang, Y.-J.: When there is no progress with a task-oriented chatbot: A conversation analysis. In: *Proceedings of the 21st International Conference on Human-Computer Interaction with Mobile Devices and Services*, pp. 1-6 (2019).
37. Li, C.-H., Yeh, S.-F., Chang, T.-J., Tsai, M.-H., Chen, K., Chang, Y.-J.: A conversation analysis of non-progress and coping strategies with a banking task-oriented chatbot. In: *Proceedings of the CHI Conference on Human Factors in Computing Systems*, pp. 1-12 (2020).
38. Li, T.J.-J., Chen, J., Xia, H., Mitchell, T.M., Myers, B.A.: Multi-modal repairs of conversational breakdowns in task-oriented dialogs. In: *Proceedings of the 33rd Annual ACM Symposium on User Interface Software and Technology*, pp. 1094-1107 (2020).
39. Liao, Q.V., Davis, M., Geyer, W., Muller, M., Shami, N.S.: What can you do? Studying social-agent orientation and agent proactive interactions with an agent for employees. In: *Proceedings of the ACM Conference on Designing Interactive Systems*, pp. 264-275 (2016).
40. Liao, Q.V., Srivastava, B., Kapanipathi, P.: Tailoring Conversational UX through the Lens of Dialogue Complexity. In: *Proceedings of the CHI Workshop on Conversational UX Design* (2017).
41. Liebrecht, C., Hooijdonk, C.v.: Creating humanlike chatbots: what chatbot developers could learn from webcare employees in adopting a conversational human voice. In: *Proceedings of the International Workshop on Chatbot Research and Design*, pp. 51-64 (2019).

42. Lin, Z., Cui, S., Li, G., Kang, X., Ji, F., Li, F., Zhao, Z., Chen, H., Zhang, Y.: Predict-Then-Decide: A Predictive Approach for Wait or Answer Task in Dialogue Systems. *IEEE/ACM Transactions on Audio, Speech and Language Processing* 29, 3012-3024 (2021).
43. Liu, C., Jiang, J., Xiong, C., Yang, Y., Ye, J.: Towards building an intelligent chatbot for customer service: Learning to respond at the appropriate time. In: *Proceedings of the 26th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining*, pp. 3377-3385 (2020).
44. Luger, E., Sellen, A.: "Like Having a Really Bad PA" The Gulf between User Expectation and Experience of Conversational Agents. In: *Proceedings of the CHI Conference on Human Factors in Computing Systems*, pp. 5286-5297 (2016).
45. Mishra, N., KR, K., Bu, Y.: The Role of Chatbots in Enhancing Staff Productivity of Network Service Providers in Bengaluru. *IUP Journal of Organizational Behavior* 19(4), (2020).
46. Mozafari, N., Weiger, W.H., Hammerschmidt, M.: The Chatbot Disclosure Dilemma: Desirable and Undesirable Effects of Disclosing the Non-Human Identity of Chatbots. In: *Proceedings of the 41st International Conference on Information Systems (ICIS)* (2020).
47. Nguyen, Q.N., Sidorova, A., Torres, R.: User interactions with chatbot interfaces vs. Menu-based interfaces: An empirical study. *Computers in Human Behavior* 128 (2022).
48. Pizzi, G., Scarpi, D., Pantano, E.: Artificial intelligence and the new forms of interaction: Who has the control when interacting with a chatbot? *Journal of Business Research* 129, 878-890 (2021).
49. Poser, M., Bittner, E.A.: (Re) Designing IT Support: How Embedded and Conversational AI Can Augment Technical Support Work. In: *Proceedings of the 42nd International Conference on Information Systems (ICIS)* (2021).
50. Pricilla, C., Lestari, D.P., Dharma, D.: Designing interaction for chatbot-based conversational commerce with user-centered design. In: *Proceedings of the 5th International Conference on Advanced Informatics*, pp. 244-249 (2018).
51. Radziwill, N.M., Benton, M.: Evaluating Quality of Chatbots and Intelligent Conversational Agents. *Software Quality Professional* 19(3) (2017).
52. Reynaud, Q., Donnart, J.-Y., Corruble, V.: Evaluating the impact of anticipation on the efficiency and believability of virtual agents. In: *Proceedings of the International Conference on Intelligent Virtual Agents*, pp. 360-363 (2014).
53. Roy, R., Naidoo, V.: Enhancing chatbot effectiveness: The role of anthropomorphic conversational styles and time orientation. *Journal of Business Research* 126, 23-34 (2021).
54. Sameh, A.-N., Benbasat, I., Cenfetelli, R.: Trustworthy virtual advisors and enjoyable interactions: designing for expressiveness and transparency. In: *Proceedings of the 18th European Conference on Information Systems (ECIS)* (2010).
55. Sandu, N., Gide, E.: Adoption of AI-Chatbots to enhance student learning experience in higher education in India. In: *Proceedings of the 18th International Conference on Information Technology Based Higher Education and Training*, pp. 1-5 (2019).
56. Sarikaya, R.: The technology behind personal digital assistants: An overview of the system architecture and key components. *IEEE Signal Processing Magazine* 34, 67-81 (2017).
57. Schmidhuber, J., Schlögl, S., Ploder, C.: Cognitive Load and Productivity Implications in Human-Chatbot Interaction. In: *Proceedings of the 2nd International Conference on Human-Machine Systems*, pp. 1-6 (2021).

58. Schuetzler, R.M., Grimes, G.M., Giboney, J.S.: An investigation of conversational agent relevance, presence, and engagement. In: Proceedings of the Americas Conference on Information Systems (AMCIS) (2018).
59. Schuetzler, R.M., Grimes, G.M., Giboney, J.S.: The effect of conversational agent skill on user behavior during deception. *Computers in Human Behavior* 97, 250-259 (2019).
60. See, A., Roller, S., Kiela, D., Weston, J.: What makes a good conversation? how controllable attributes affect human judgments. In: Proceedings of the Conference on North American Chapter of the Association for Computational Linguistics: Human Language Technologies, pp. 1702-1723 (2019).
61. Siddike, M., Kalam, A., Spohrer, J., Demirkan, H., Kohda, Y.: People's interactions with cognitive assistants for enhanced performances. In: Proceedings of the 51st Hawaii International Conference on System Sciences (HICSS) (2018).
62. Tan, R., Li, Y., Huang, Q.: Enhancing Service Chatbot Effectiveness: The Effect of Dyadic Communication Traits on Consumer Unplanned Purchase. In: Proceedings of the 42nd International Conference on Information Systems (ICIS) (2021).
63. Tegos, S., Demetriadis, S.: Conversational agents improve peer learning through building on prior knowledge. *Journal of Educational Technology & Society* 20(1), 99-111 (2017).
64. Thies, I., Menon, N., Magapu, S., Subramony, M., O'Neill, J.: How do you want your Chatbot. An Exploratory Wizard-of-Oz Study with Young, Urban Indians. In: Proceedings of the IFIP Conference on Human-Computer Interaction, pp. 441-459 (2017).
65. Toxtli, C., Monroy-Hernández, A., Cranshaw, J.: Understanding chatbot-mediated task management. In: Proceedings of the CHI Conference on Human Factors in Computing Systems, pp. 1-6 (2018).
66. Valério, F.A., Guimarães, T.G., Prates, R.O., Candello, H.: Here's what I can do: Chatbots' strategies to convey their features to users. In: Proceedings of the 16th Brazilian Symposium on Human Factors in Computing Systems, pp. 1-10 (2017).
67. Valério, F.A., Guimarães, T.G., Prates, R.O., Candello, H.: Comparing users' perception of different chatbot interaction paradigms: a case study. In: Proceedings of the 19th Brazilian Symposium on Human Factors in Computing Systems, pp. 1-10 (2020).
68. Valério, F.A., Guimarães, T.G., Prates, R.O., Candello, H.: Chatbots Explain Themselves: Designers' Strategies for Conveying Chatbot Features to Users. *Journal of Interactive Systems* 9(3) (2018).
69. Van den Broeck, E., Zarouali, B., Poels, K.: Chatbot advertising effectiveness: When does the message get through? *Computers in Human Behavior* 98, 150-157 (2019).
70. Wilkinson, D., Alkan, Ö., Liao, Q.V., Mattetti, M., Vejsbjerg, I., Knijnenburg, B.P., Daly, E.: Why or why not? The effect of justification styles on chatbot recommendations. *ACM Transactions on Information Systems* 39(4), 1-21 (2021).
71. Wu, Y., Li, Z., Wu, W., Zhou, M.: Response selection with topic clues for retrieval-based chatbots. *Neurocomputing* 316, 251-261 (2018).
72. Zierau, N., Elshan, E., Visini, C., Janson, A.: A review of the empirical literature on conversational agents and future research directions. In: Proceedings of the 41st International Conference on Information Systems (ICIS) (2020).