## Overview of Text Analytics techniques in business.

Technique	Studies	Business area	Practical contribution
Information retrieval	[1–3]	cross-department	enterprise search for the relevant information in the unstructured data, knowledge management
Information extraction/ NER	[1,4,5]	cross-department	key component in NLP systems for question-answering, information retrieval, relation extraction
Text summarization / topic modeling	[1,4,6–9]	cross-department	extraction of topics/ themes from a large corpus, knowledge management, brand management, automatic report generation, Recommender Systems
Text classification and clustering	[4,10–13]	email, (customer) service management, product management	spam detection, news filtering, theme/topic detection, sentiment analysis, automatic assignment of emails and tasks, customer/ product segmentation, identification and prediction of customer/ product-related problems, strategic improvement of products and services
Question-answering	[1,14]	cross-department	customer service chat-bots, decision support for BP workers
Sentiment analysis	[1,15–17]	brand management, (customer) service and product management	identifying customer perception of brand, service, product, proactively reacting with the help of marketing campaigns, service or product improvements
Thesauri, taxonomies, ontologies	[18,19]	cross-department	expert systems, search engines, corporate thesauri, taxonomies, ontologies representing domain-specific knowledge and organizational information

- [1] H. Chen, R.H.L. Chiang, V.C. Storey, Business Intelligence and Analytics: From Big Data to Big Impact, MIS Q. 36 (2012) 1165–1188. https://doi.org/10.2307/41703503.
- [2] C.D. Manning, P. Raghavan, H. Schütze, Introduction to Information Retrieval, Cambridge University Press, 2008.
- [3] E. Gunadi, T. Plumbaum, S. Albayrak, Applied Distributed Information Retrieval in Enterprise Search, in: Proc. First Int. Work. Support. Complex Search Tasks Co-Located with 37th Eur. Conf. Inf. Retr., CEUR, Vienna, 2015.
- [4] C.C. Aggarwal, C. Zhai, Mining Text Data, Springer, 2012.
- [5] V. Yadav, S. Bethard, A Survey on Recent Advances in Named Entity Recognition from Deep Learning Models, in: Proc. 27th Int. Conf. Comput. Linguist., Association for Computational Linguistics, Santa Fe, 2018: pp. 2145–2158.
- [6] D. Blei, Probabilistic Topic Models, Commun. ACM. 55 (2012) 77–84. https://doi.org/10.1145/2133806.2133826.
- [7] N. Rizun, K. Ossowska, Y. Taranenko, Modeling the Customer's Contextual Expectations Based on Latent Semantic Analysis Algorithms, in: Proc. 38th Int. Conf. Inf. Syst. Archit. Technol. ISAT 2017, Part II, 2018: pp. 364–373. https://doi.org/10.1007/978-3-319-67229-8\_33.
- [8] N. Rizun, A. Revina, V. Meister, Method of Decision-Making Logic Discovery in the Business Process Textual Data, in: W. Abramowicz, R. Corchuelo (Eds.), BIS 2019 Bus. Inf. Syst. Lect. Notes Bus. Inf. Process., Springer Cham, Sevilla, 2019: pp. 70–84. https://doi.org/10.1007/978-3-030-20485-3\_6.
- [9] N. Rizun, Y. Taranenko, W. Waloszek, The algorithm of modelling and analysis of latent semantic relations: Linear algebra vs. probabilistic topic models, in: P. Różewski, C. Lange (Eds.), Int. Conf. Knowl. Eng. Semant. Web. KESW 2017 Knowl. Eng. Semant. Web, Springer, Cham, Szczecin, 2017: pp. 53–68. https://doi.org/10.1007/978-3-319-69548-8 5.
- [10] O. Müller, I. Junglas, S. Debortoli, J. vom Brocke, Using Text Analytics to Derive Customer Service Management Benefits from Unstructured Data, MIS Q. Exec. 15 (2016) 243–258.
- [11] G. Tang, J. Pei, W.-S. Luk, Email mining: tasks, common techniques, and tools, Knowl. Inf. Syst. 41 (2014) 1–31. https://doi.org/10.1007/s10115-013-0658-2.
- [12] I. Katakis, G. Tsoumakas, I. Vlahavas, E-mail Mining, in: Web Data Manag. Pract., IGI Global, 2007: pp. 220–243. https://doi.org/10.4018/978-1-59904-228-2.ch010.
- [13] N. Rizun, W. Waloszek, Methodology for text classification using manually created corpora-based sentiment dictionary, in: A. Fred, J. Filipe (Eds.), IC3K 2018 Proc. 10th Int. Jt. Conf. Knowl. Discov. Knowl. Eng. Knowl. Manag., SCITEPRESS Science and Technology Publications, Lda., Seville, 2018: pp. 212–220.

- [14] M. Maybury, New Directions In Question Answering, in: Springer, 2008: pp. 533–558. https://doi.org/10.1007/978-1-4020-4746-6\_18.
- [15] N. Rizun, A. Revina, Business Sentiment Analysis. Concept and Method for Perceived Anticipated Effort Identification, in: A. Siarheyeva, C. Barry, M. Lang, H. Linger, C. Schneider (Eds.), Inf. Syst. Dev. Inf. Syst. Beyond 2020 (ISD 2019 Proceedings), AIS eLibrary, Toulon, 2019: pp. 1–12.
- [16] B. Liu, Sentiment analysis and opinion mining, Synth. Lect. Hum. Lang. Technol. 5 (2012) 1–184. https://doi.org/10.2200/S00416ED1V01Y201204HLT016.
- [17] B. Pang, L. Lee, Opinion Mining and Sentiment Analysis, Now Publishing, 2008.
- [18] A. Gilchrist, Thesauri, taxonomies and ontologies-an etymological note, J. Doc. 59 (2003) 7–18.
- [19] C. Brewster, Y. Wilks, Ontologies, Taxonomies, Thesauri: Learning from Texts, in: M. Deegan (Ed.), Proc. Use Comput. Linguist. Extr. Keyword Inf. from Digit. Libr. Content Work., London, 2004: pp. 1–36. www.yahoo.com (accessed October 18, 2020).