

SENTIMENT TRENDS ACROSS AGILE AND DIGITAL TRANSFORMATION TOPICS IN REDDIT DISCUSSIONS

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Abstract

Sentiment knowledge in Agile practice and Digital Transformation conversations is important in establishing industry sentiments, issues of adoption, and emerging trends. This study extends previous studies by bridging topic modeling and sentiment analysis in examining sentiment variations between various topics on Agile. Using Latent Dirichlet Allocation (LDA), we analyzed 3,777 Reddit threads and identified salient topics of discussion including Agile approaches, web sites, cognitive challenges, project management, and business uses. Sentiment scores were assigned using VADER to measure the emotional note associated with each topic. The analysis indicates that topics such as cognition, education, and training are likely to have extremely positive sentiment, while software performance, project issues, and market trends are likely to have negative or mixed sentiments. These findings provide us with insightful views into how different aspects of Agile and Digital Transformation are perceived in online discussions. The results have applied value: trainers and practitioners in Agile can focus on reinforcing positively embraced areas while solving the issues revealed during critical conversations. We recommend incorporating targeted training and strategy reforms based on sentiment trends. This work demonstrates the usefulness of applying topic modeling and sentiment analysis for revealing underlying community opinions, creating a soundset toolset for mapping facilitators and inhibitors of Agile adoption.

Keywords: Agile Methodology, Digital Transformation, Sentiment Analysis, Topic Modeling, Natural Language Processing (NLP), Reddit Discussions.

INTRODUCTION

In today's fast-paced and dynamic technology landscape, organizations are increasingly looking towards Agile approaches and Digital Transformation paradigms to stay competitive, responsive, and innovative. Developed initially in software development, Agile approaches have extended far and wide across industries, offering organizations agile and responsive frameworks that facilitate teamwork, incremental refinement, and rapid response to changing marketplace requirements. Concurrently, Digital Transformation initiatives—involving the infusion of digital technologies to completely overhaul processes, cultures, and customer experiences—have become an integral part of strategic organizational growth and survival.

Despite growing adoption, the day-to-day use of Agile frameworks in real-world settings is filled with obstacles, levels of acceptance, and complex perceptions among stakeholders. An understanding of how these practices are perceived by industry experts and broader communities provides valuable

insights on adoption enablers, barriers, and emerging trends. Online forums and communities such as Reddit are treasure troves of real-world data that reflect true discourse and diverse opinions about Agile approaches and Digital Transformation. Through such platforms, researchers and practitioners obtain access to narratives generated by communities that are typically indicative of broader organizational opinion. Previous studies in this area have established the applicability of Natural Language Processing (NLP) methods, i.e., topic modeling and sentiment analysis, to detect thematic trends and affective positions in community forums (Vidgen & Wang, 2009; Ghezzi & Cavallo, 2018; Hidri, Abazi Chaushi, & Tigno, 2024). However, current research has been inclined to emphasize overall sentiment distributions rather than providing an in-depth understanding of how sentiment varies notably by theme. Observing this lacuna, the current study extends earlier work by explicitly linking sentiment polarity to thematic areas identified through topic modeling, thereby providing a more detailed picture of community sentiment towards individual Agile-themed topics.

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Through its integration of topic modeling and sentiment analysis, the current study aims to deliver actionable results that can guide Agile adoption plans, education activities, and organizational decision-making. Specifically, the study responds to the following research questions:

RQ1: What are the top issues emerging in Reddit threads regarding Agile approaches and Digital Transformation?

RQ2: How does sentiment orientation (positive, negative, neutral) vary across these emerged Agile and Digital Transformation issues?

RQ3: What practical insights and recommendations can be derived for Agile professionals based on sentiment fluctuation across specific Agile themes?

The paper is organized in a way that the following section provides an overview of relevant literature, and following that a clear methodology of data collection, preprocessing, sentiment analysis, and topic modeling validation. Next, the results section provides findings that are extensible, the discussion explains these results in detail, and finally, the conclusion includes main contributions, implications, and suggests paths for future research.

LITERATURE REVIEW

Agile practices have emerged as essential to enabling organizations to respond rapidly to dynamic environments, encourage innovation, and achieve team collaboration. Originally constructed for software development, Agile values are now widely applied outside the IT sector, enabling flexibility, continuous delivery, and customer-centric processes (Rigby et al., 2016). Digital Transformation (DT), characterized by the integration of digital technologies into business models, often utilizes Agile practices to enable rapid iteration and adaptive change (Fitzgerald et al., 2014). Recent studies emphasize the importance of understanding how practitioners and the general public perceive Agile and DT (Saura et al., 2021). Popular social media platforms like Twitter (x) have valuable data to analyze such sentiments (Hidri, Çausi, Tigno, and Baholli, 2024). Hidri, Çausi, Tigno, and Baholli (2024) analyzed sentiments in Twitter data through sentiment analysis and found that while most Agile comments were positive, scalability and implementation issues drew critics. Similarly, Spiegler et al. (2022) stated that community-based observations in Reddit forums are describing subtle affective undertones around Agile migrations, including distrust of bureaucratic constraints and loss of control.

Sentiment analysis based on Natural Language Processing (NLP) techniques such as VADER and TextBlob has gained traction more and more in Agile-related research. Both of them have support for automated determination of text that involves sentiment and are especially useful when used alongside social media data (Hutto & Gilbert, 2014; Medhat et al., 2014). Through the application of

sentiment analysis, researchers have quantified team morale (Novielli et al., 2018), gauged usability of Agile tools (Koch et al., 2021), and identified the reasons behind dissatisfaction in Agile retrospectives (Mohanani et al., 2021).

To determine themes in large bodies of text, Latent Dirichlet Allocation (LDA) has been utilised extensively in management studies and software engineering (Blei et al., 2003). LDA has been utilised by Bani et al. (2021) to determine emerging priorities in hybrid team structures in Agile project descriptions. Used in conjunction with sentiment analysis, topic modeling allows researcher to follow affective dynamics between themes—a method developed across this research. Hidri and Tigno (2024), in their bibliometric study of Agile Enterprise research, pinpointed a growing scholarly emphasis on Agile scalability, governance, and integration within Digital Transformation. Worth mentioning is that they pointed out a recurring gap for research covering community feeling and public opinion of Agile adoption, which this research directly addresses.

Digital Transformation differs by region. Fata and Myftaraj (2023) discussed the role of digital platforms and ICT in enabling circular economy guidelines in Albania and emphasized the need for cross-disciplinary digital literacy. While not specifically writing on Agile, their article provides regional context to how digital initiatives are accepted and absorbed. Petani et al. (2021) also call for integrating digital transformation guidelines into organizational culture and professional training.

MATERIALS AND METHODS

A. Data Collection and Description

We collected data from Reddit, a vibrant, heterogeneous online community with active discussions on Agile techniques and Digital Transformation. The dataset was 3,777 posts, providing rich, unstructured textual data with diverse community attitudes, perceptions, and experiences.

B. Data Preprocessing

We carried out various preprocessing steps for the textual data using Python and NLP libraries (NLTK, Gensim):

- *Tokenization*: Splitting posts into words.
- *Stop-word Removal*: Removing commonly occurring words and domain-irrelevant terms (e.g., “godzilla,” “batman,” numerical references).
- *Lemmatization*: Lowercasing words to their base form to normalize semantic meaning.
- *Noise Elimination*: Removing URLs, mentions, hashtags, punctuation, and semantically irrelevant special characters to reduce textual noise.

These operations produced a clean, semantically dense dataset most appropriate for topic modeling and sentiment analysis.

C. Sentiment Analysis using VADER

Sentiment analysis was conducted using the VADER (Valence Aware Dictionary and sEntiment Reasoner) algorithm. VADER assigns sentiment polarity based on optimized social media text-specific lexical rules. Compound sentiment score was assigned to each Reddit post, in addition to being labeled as:

- Positive (score > 0.05)
- Negative (score < -0.05)
- Neutral (-0.05 ≤ score ≤ 0.05)

Sentiment categories were then summarized quantitatively to estimate overall community sentiment towards Agile-related issues.

D. Topic Modeling with Latent Dirichlet Allocation (LDA)

Topic modeling was carried out utilizing the Latent Dirichlet Allocation (LDA) algorithm, an Unsupervised machine learning algorithm of widespread use in finding thematic organization in big text data. We ran LDA with 15 topics that we had selected based on preliminary coherence validation (c_v = 0.5482), achieving a balance between thematic coherence and interpretability. Each Reddit post was annotated with a major topic—the topic with the highest probability score for a particular document.

E. Topic Modeling Validation

For interpretability and relevance of the produced topics, the LDA model had previously been validated using the topic coherence score (c_v metric). After optimization and Gauss preprocessing fine-tuning, the model achieved a coherence score of 0.5482, confirming semantic reliability and consistency of the uncovered topics.

E. Sentiment-Topic Mapping

Following topic assignment and sentiment labeling, we ran a sentiment-topic alignment analysis. We calculated the distribution of sentiment labels (Positive, Negative, Neutral) for every dominant topic, which allowed comparison of the emotional tones in different thematic areas.

G. Visualization and Interpretation

Sentiment by topic was visualized with stacked bar plots, which intuitively revealed sentiment variations within thematic discussions. The visualizations provided a summary of community sentiment trends relating to specific Agile and Digital Transformation topics, allowing for brief and actionable insights.

RESULTS

A. Overall Sentiment Distribution

3,777 Reddit threads relating to Agile methods and Digital Transformation were examined with the assistance of the VADER sentiment analysis tool. The sentiment breakdown Table 1 is as follows:

Table 1 Sentiment Distribution, Generated by the author

Sentiment	Count	Percentage (%)
Positive	2964	78.47
Negative	593	15.70
Neutral	220	5.82

The average sentiment rating was 0.61, indicating a mostly positive sentiment tone in the social media discourse. This is proof of the strength of support and passion for Agile and Digital Transformation practices within the community but with some criticism.

B. Topic Modeling and Dominant Topic Assignment

Topic modeling was performed with Latent Dirichlet Allocation (LDA) and 15 topics. Each post was labeled with its most salient topic—the topic with the highest probability score for a particular document.

Topic Modeling Validation

To ensure topic relevance and interpretability, the performance of the LDA model was earlier measured using the coherence score (c_v metric). After preprocessing optimization and domain-specific noise removal, the coherence score of the final model was 0.5482, confirming the semantic coherence and consistency of the topics. This confirmed setting was reused in the present study to ensure a firm foundation for sentiment linking to thematic structures.

C. Sentiment Variation by Topic

Each sentiment for each post was also compared to its most dominant topic. Mapping this identified certain emotional patterns in different Agile and Digital Transformation topics. Table 2 and Figure 2 presents the sentiment distribution (positive, negative, neutral) by dominant topic.

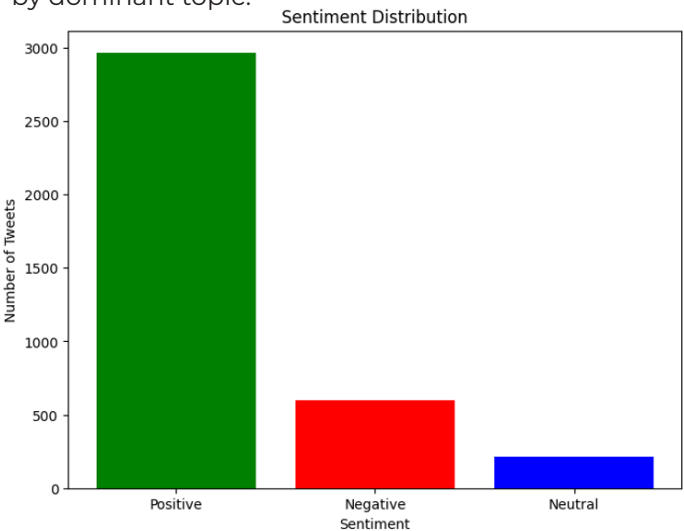


Figure 1 Sentiment Distribution

Main findings are:

Table 2 Topic Sentiment Distribution

Dominant Topic	Positive %	Negative %	Neutral %
0.00	58.16	15.76	26.08
1.00	44.49	55.07	0.44
2.00	84.35	15.65	0.00
3.00	98.87	0.00	1.13
4.00	82.00	18.00	0.00
5.00	96.37	3.11	0.52
6.00	94.51	3.70	1.79
7.00	100.00	0.00	0.00
8.00	48.44	51.56	0.00
9.00	86.77	13.23	0.00
10.00	95.83	4.17	0.00
11.00	93.51	2.60	3.90
12.00	88.44	10.98	0.58
13.00	74.39	25.26	0.35
14.00	83.78	16.22	0.00

Topic 3 (Cognitive and Learning Aspects) had 98.87% positive sentiment, expressing clear appreciation from the community for creativity, mental focus, and intellectual engagement in Agile work.

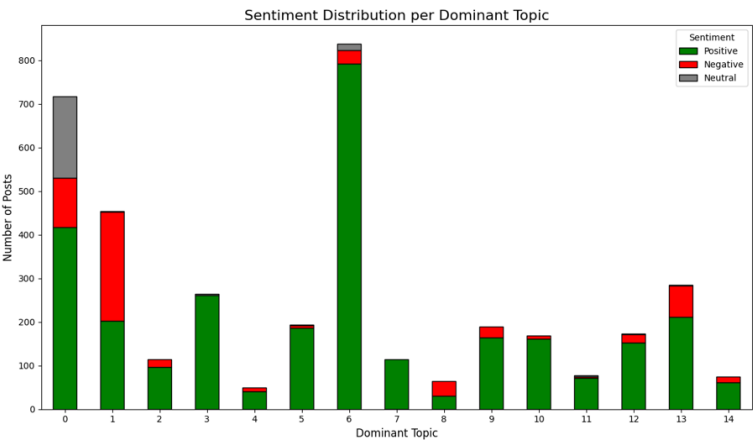


Figure 2 Sentiment Distribution per Dominant Topic

Topic 7 (Hands-on Practice and XP Tools) received 100% positive sentiment, reflecting strong support for Agile tools and hands-on learning frameworks.

Topic 6 (Implementation Refinements) received 94.51% positive sentiment, reflecting positivity about process improvement, changemanagement, and iteration.

Topic 1 (Market and Organizational Critique) received 55.07% negative sentiment, perhaps due to frustration with leadership, practice misalignments, or commercialization of Agile.

Topic 8 (Team Friction or Performance Barriers) recorded a 51.56% negative sentiment, most likely from complaints with group interaction, undefined roles, or misapplication of Agile principles.

Topic 0 (General Agile Discourse) revealed a mixed sentiment profile, at 58.16% positive, 26.08% neutral, and 15.76% negative, typical of exploratory or informative content and not biased opinion.

C. Summary of Key Topic-Level Sentiment Trends shown in Table 3

Table 3 Topic-Level Sentiment

Topic	Description (Keywords)	Positive %	Negative %	Notable Insight
3	Cognitive, creativity, focus	98.87	0.00	Highly favorable discussion on mental engagement in Agile
7	XP, learning tools, practice	100.00	0.00	Total approval for applied Agile frameworks
6	Tiered changes, issue resolution	94.51	3.70	Strong support for process refinement
1	Team, market, organization	44.49	55.07	Criticism of leadership, market pressure, or Agile misuse
8	People, team dynamics, blockers	48.44	51.56	Mixed to negative views, possibly around coordination or resistance

D. Interpretation

These findings highlight that the Reddit community does not receive all Agile and Digital Transformation subjects equally. While topics that touch on training, cognition, and improvement are received with great positivity, those touching on organizational impediments, market skepticism, or implementation failure are received with critical or mixed sentiment.

By linking sentiment distributions to specific topics, the analysis reveals fine-grained details of public opinion about Agile practices. This topic-level resolution is more revealing than aggregated sentiment metrics and enables the identification of salient regions of approval and controversy in Agile discourse.

DISCUSSIONS

This research examined how sentiment varies on some Agile and Digital Transformation issues being discussed on Reddit. From Latent Dirichlet Allocation (LDA), we obtained 15 topics with differing community dialogue ranging from Agile training and cognitive dynamics to market and organizational issues. We assessed the topics using the VADER tool for sentiment analysis and discovered nuanced emotional responses, which largely differed among the topics identified.

We conclude that they propose a largely favorable view towards issues of cognitive benefits, training approaches, and repeated refining processes (e.g., Topics 3, 6, and 7). They all registered over 90% positivity, and Topic 7 (Agile learning tools and XP practices) recorded a complete positivity. These findings suggest strong support among communities of Agile's learning, creativity, and iterative enhancement mechanisms.

Conversely, similar debates around market forces, inner implementation challenges, and software project management issues (e.g., Topics 1 and 8) had significantly more negative emotions. With more than half of the posts classified as negative in these topics, this indicates real frustration or criticism in the community about Agile being used in real-world situations. The existence of mixed emotions in these topics emphasizes the complexity and difficulty that organizations experience in mapping Agile frameworks well with market conditions and internal organizational setups.

Practical Implications and Recommendations

The particular affect variations among Agile-themed topics have particular real-world implications. Practitioners, educators, and decision-makers can utilize these insights in a variety of ways:

Educational Priority: The strongly positive sentiment for cognitive and learning-focused topics shows that organizations should actively work to prioritize Agile training modules, certifications, and cognitive ability building programs. Positive community sentiment suggests that such efforts are sure to be adopted, guaranteeing greater internal buy-in and adoption success.

Focused Interventions in Implementation: Negative attitudes toward market pressure and implementation challenges highlight areas that require additional managerial attention. Companies need to scrutinize Agile implementation in practice in depth, addressing situations of typical friction such as leadership alignment, organizational readiness, and realistic setting, thus actively avoiding negative experiences.

Tailored Communication Strategies: The recognition of difference in sentiment allows organizations to adapt their Agile communications and training strategies. Clearer language on actual marketplace challenges, more open discussion of possible obstacles, and focused preparation for reality in the marketplace can reduce frustration and increase community buy-in and confidence.

Limitations of the Study

In spite of the strength of methodology and analytical precision, a few limitations need to be taken into consideration:

Platform Bias: Users on Reddit may not perfectly reflect the whole professional Agile community. The discussions are naturally biased toward digitally active users, tech-friendly people, and potentially toward particular industries.

Sentiment Analysis Subjectivity: As good as the lexical-based VADER model is, it may not be tapping into advanced expression, sarcasm, or context-specific nuances of natural language. Follow-up work using context-sensitive models like BERT could make such findings more accurate.

Human Interpretation of Topics: Interpretation of topics generated by LDA has some degree of subjectivity, and topic names are interpretative automatically. Varying researchers could classify or define topics very slightly differently.

Future Directions and Recommendations for Further Research

Future research can extend this study in several important ways:

Cross-Platform Comparisons: Comparing the sentiment distributions from Reddit threads to other professional platforms such as LinkedIn or Twitter would even more strongly corroborate or refute these findings, further increasing external generalizability.

Temporal Analysis of Sentiments: Analyzing how sentiment distributions change over time can provide further insights into Agile adoption patterns and maturity levels.

Context-Aware Sentiment Techniques: Employing cutting-edge sentiment analysis techniques with improved comprehension of vague terms may enhance the precision and transparency of sentiment classification, rendering it more applicable.

CONCLUSIONS

This research probed sentiment across unique Agile and Digital Transformation topics being debated among the Reddit community using an integrated approach of topic modeling (LDA) and sentiment analysis (VADER). Our content analysis of 3,777 Reddit posts uncovered interesting differences between community perception according to topic context, highlighting the need for analyzing sentiment not merely in the aggregate but also at a more granular, topic-by-topic level.

The results showed very high cognitive involvement, Agile education, and iterative process improvement themes with strongly positive attitudes. Contrarily, strong negativity was witnessed in themes that addressed market pressure, organizational resistance, and software implementation difficulties. The results show that Agile practices are strongly supported in theory but have practical issues that must be consciously dealt with. In practice, these results offer valuable guidance for Agile practitioners, trainers, and decision-makers to enable targeted strategies that build on strengths and strengthen areas of concern. Organizations can allocate resources better to training and cognition-intensive activities while addressing implementation issues openly and positively.

In summary, this study demonstrates the potential for combining topic modeling with sentiment analysis to learn even more about community sentiment in order to plan even more effective Agile adoption. Future research directions are comparative cross-platform analysis, long-term sentiment studies, and employment of more sophisticated context-sensitive sentiment analysis techniques in order to even more refine these insights.

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Conflict of interests

The authors declare no conflict of interest.

References

- Bani, M., Giuffrida, R., & Tamburri, D. A. (2021). Mining agile team discussions to detect hybrid process trends. *Journal of Systems and Software*, 178, 110982. <https://doi.org/10.1016/j.jss.2021.110982>
- Blei, D. M., Ng, A. Y., & Jordan, M. I. (2003). Latent Dirichlet Allocation. *Journal of Machine Learning Research*, 3(Jan), 993–1022.
- Fata, I., & Myftaraj, E. (2023). Solutions based on information and communication technologies for the circular economy. In *Circular Economy: Opportunities and Challenges*
- Fitzgerald, B., Stol, K. J., O'Sullivan, R., & O'Brien, D. (2014). Scaling agile methods to regulated environments: An industry case study. In *ICSE Companion* (pp. 863–872). <https://doi.org/10.1145/2591062.2591116>
- Hidri, F., & Tigno, G. (2024, May). A bibliometric analysis of Agile Enterprise. In *International Conference on Innovations in Technology, Business and Transformation* (pp. 75–89). Cham: Springer Nature Switzerland.
- Hidri, F., Çaushi, B. A., Tigno, G., & Baholli, I. (2024). Exploring public sentiment towards Agile and Digital Transformation: A Twitter sentiment analysis. In *TBU 1st International Conference Proceedings* (pp. 253–264).
- Hutto, C. J., & Gilbert, E. (2014). VADER: A parsimonious rule-based model for sentiment analysis of social media text. In *Proceedings of the Eighth International Conference on Weblogs and Social Media* (pp. 216–225). AAAI.
- Koch, G., Grüner, S., & Holl, M. (2021). Understanding user feedback in agile development: A sentiment analysis approach. *Empirical Software Engineering*, 26, 1–29. <https://doi.org/10.1007/s10664-020-09886-w>
- Medhat, W., Hassan, A., & Korashy, H. (2014). Sentiment analysis algorithms and applications: A survey. *Ain Shams Engineering Journal*, 5(4), 1093–1113.
- Mohanani, R., Turhan, B., & Ralph, P. (2021). Managing biases in agile retrospectives. *IEEE Transactions on Software Engineering*, 47(5), 1070–1086. <https://doi.org/10.1109/TSE.2019.2949088>
- Novielli, N., Calefato, F., & Lanubile, F. (2018). Towards the integration of sentiment analysis into software development tools. *Journal of Software: Evolution and Process*, 30(11), e1951. <https://doi.org/10.1002/smr.1951>
- Petani, R. M., Bjelic, J., & Vuksanovic, I. (2021). Organizational readiness for digital transformation: A case study from Serbia. *Management: Journal of Contemporary Management Issues*, 26(1), 125–141.
- Rigby, D. K., Sutherland, J., & Noble, A. (2016). Agile at scale. *Harvard Business Review*, 94(5), 88–96.
- Saura, J. R., Palacios-Marqués, D., & Iturricha-Fernández, A. (2021). Ethical design in social media: Assessing feedback mechanisms for open innovation. *Journal of Business Research*, 124, 863–871. <https://doi.org/10.1016/j.jbusres.2020.03.011>
- Spiegler, S. V., Heine, M., & Berente, N. (2022). Unpacking agile's contradictions: A paradox perspective of agile at scale. *Information Systems Journal*, 32(5), 839–873. <https://doi.org/10.1111/isj.12345>