

TRENDS AND CHALLENGES IN MANAGING THE FORESTRY AND WOOD-PROCESSING INDUSTRY

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ABSTRACT

The business environment is influenced by various constantly evolving trends impacting crucial corporate management aspects. The aim of the research was to identify trends and challenges in managing the forestry and wood-processing industry. The focus was on analyzing corporate culture. The study utilized the globally recognized methodology of Cameron and Quinn to measure corporate culture. A gap in existing research is addressed, as more attention should be given to corporate culture within the forestry and wood-processing industry, especially in Slovakia. The results revealed that various cultural types were prevalent, with hierarchy and clan corporate cultures being the most dominant. It indicates that forestry and wood-processing companies tend to operate in a formalized and structured work environment, where procedures and regulations are prioritized, while also focusing on the internal environment and employee care. A key challenge for management is implementing the clan corporate culture preferred in the future, focusing on the long-term development of employees. It is crucial, as human capital plays an essential role in increasing the productivity, output of an organization, and competitive advantage.

Keywords: management; trends and challenges; forestry; wood-processing industry.

INTRODUCTION

Dynamism, the speed of change, globalization, digital transformation, optimization, quality improvement, demographic shifts, skills shortages, the platform economy, circular economy, and artificial intelligence are just a few of the current trends that shape the corporate environment (Potkány *et al.*, 2024; Piwowar-Sulej *et al.*, 2024; Machova *et al.*, 2023; Stacho *et al.*, 2021; Teplická and Hurná, 2021). These factors are rapidly evolving and touch on key aspects of business management, including corporate culture (Herget, 2023). Successfully navigating these environments presents new challenges, with corporate culture undeniably playing a crucial role in overcoming these challenges (Herget, 2023). Corporate culture is considered one of the critical features of any organization related to its performance (Mikusová *et al.*, 2023). Creating an influential corporate culture is challenging as it requires senior managers to embed shared values (Abernethy *et al.*, 2024).

Corporate culture has been attracting increasing attention in recent decades due to its potential to improve an organization's prospects from the managerial perspective (Calderón *et al.*, 2022; Bendak *et al.*, 2020; Stacho *et al.*, 2016). Corporate culture involves the organization's value system, traditions, customs, and how things are carried out (Li *et al.*, 2024; Todorova, 2024). It originates from business practices and influences employee

behavior (Sun *et al.*, 2024). Corporate culture has evolved into a strategic concern due to its substantial impact on business development (Calderón *et al.*, 2022). Creating a corporate culture that aligns with the enterprise's characteristics and is embraced by most employees remains a critical focus in developing corporate culture (Sun *et al.*, 2024).

Corporate culture has been the subject of research across various contexts. Studies by Asif *et al.* (2024), Tian *et al.* (2022), and Guiso *et al.* (2015) have explored the relationship between corporate culture and performance. Nazipova *et al.* (2017) studied the stages of the elements of the corporate culture and methods for their evaluation, which allows for tracking the influence of corporate culture on the effectiveness indicators of the organization and their change. Corporate culture from the perspective of sustainable business success was investigated in the research of Samli (2024) and Begum (2022). Additionally, Li *et al.* (2021) affirmed the significance of examining corporate culture, highlighting its correlation with various business outcomes, including operational efficiency, risk-taking, earnings management, executive compensation design, firm value, and deal-making. The research of Li *et al.* (2021) adds that the linkage between corporate culture and performance is especially pronounced during challenging times. Qin *et al.* (2015) revealed that human relations and social nexus in a harmonious organizational context are the major cultural traits "gluing" management and employees together in efforts aimed at accomplishing strategic goals.

Various methods and techniques are used when investigating corporate culture, with the Organizational Culture Assessment Instrument serving as a commonly utilized tool for measuring corporate culture (Assens-Serra *et al.*, 2022; Gebretsadik, 2022). Through this approach, corporate cultures have been studied in different countries, including Indonesia (Samsie *et al.*, 2020), Colombia (Sindakis *et al.*, 2024), the Czech Republic (Balková and Jambal, 2024), Germany (Lühr *et al.*, 2022), Spain (Assens-Serra *et al.*, 2022), Sweden (Karlsson *et al.*, 2022), Romania (Dobrin *et al.*, 2021), and others. Additionally, studies have covered various sectors such as the construction industry (Pancholi and Devkar, 2023; Lühr *et al.*, 2022), tourism businesses (Simovic *et al.*, 2020), higher education (Anishchenko *et al.*, 2023), universities (Gorzelay *et al.*, 2021), and health services (Angelini *et al.*, 2021; Zervea *et al.*, 2021).

Using the Organizational Culture Assessment Instrument, four culture types can be identified, and different values are typical for each type of corporate culture (Cameron and Quinn, 1999). Clan Culture represents a friendly working environment where employees share common values and feel like part of a big family. Leaders are perceived as mentors or even parental figures. Loyalty and tradition hold the organization together, fostering strong engagement. Long-term human resource development is a priority. Success is measured by meeting client needs and caring for employees. The organization promotes teamwork, participation, and consensus (Teräväinen *et al.*, 2018; Jaeger *et al.*, 2017; Demski *et al.*, 2016; Jones *et al.*, 2014; Übius and Alas, 2009). Adhocracy Culture represents a dynamic and creative work environment where employees are encouraged to take risks. Leaders are viewed as innovators and risk-takers, fostering experimentation and innovation as a means of connection. Emphasis is placed on prominence, with a long-term focus on growth and resource creation. The introduction of new products or services is considered a success. The organization promotes individual initiative and freedom (Liao, 2019; Cameron and Quinn, 1999). Market Culture thrives in a results-driven workplace that prioritizes targets, deadlines, and task completion. Individuals are competitive and goal-oriented, with leaders being hard drivers, producers, rivals, and competitors known for setting high expectations. A drive for winning keeps the organization together, with reputation and success ranking highest. Long-term attention is on competitive activities and goal achievement, with market dominance, goal attainment, and vital metrics defining success. Competitive pricing and

market leadership remain key. The organizational style is based on competition (Assens-Serraet *et al.*, 2022; Cameron and Quinn, 1999). Hierarchy Culture embodies a formalized and structured work environment where procedures dictate actions. Leaders value efficiency-driven coordination and organization, ensuring the smooth functioning of the organization. Formal rules and policies uphold organizational unity, with long-term goals focused on stability, efficient task execution, and results. Success is defined by reliable delivery, consistent planning, and cost-effectiveness. Personnel management ensures work predictability and continuity (Gebretsadik, 2022; Heritage *et al.*, 2014).

Our research fills a gap in the current knowledge of corporate culture, as there is limited focus on the forestry and wood-processing industry, particularly in Slovakia. The operational efficiency of forest enterprises has been a topical issue in the research of Neykov *et al.* (2021). Studies by Fiedler *et al.* (2020) centered mainly on mechanization in forestry implantation, and research by Gameiro *et al.* (2024) dealt with the issue of robots for forest maintenance. Aparna *et al.* (2024) and Sagar *et al.* (2024) focused on the operational efficiency of forests. Our research aims to identify trends and challenges in managing the forestry and wood-processing industry in Slovakia concerning corporate culture because, according to Landekic *et al.* (2015), for the forestry sector, organizational or corporate culture can be a key link in restructuring processes and business improvements of forest companies.

MATERIALS AND METHODS

Trends and challenges in managing were investigated in the research on corporate culture conducted in Slovakia. Questionnaires were used. They were distributed electronically between 2020 and 2023. A total of 1,573 employees in the forestry and wood-processing industry participated in the research. The sample predominantly comprised male participants (69.36%). In terms of job positions, the sample included 60.39% blue-collar workers and 39.61% white-collar workers.

The research utilized the methodology developed by Cameron and Quinn (1999), enabling the identification of existing and preferred corporate culture by allocating points among four alternatives (alternative A, alternative B, alternative C, alternative D) across six partial areas, as follows:

1 area = Dominant Characteristics

- alternative A – The organization is a very personal place. It is like an extended family. People seem to share a lot of personal information and features.
- alternative B – The organization is a very dynamic entrepreneurial place. People are willing to stick out their necks and take risks.
- alternative C – The organization is very results-oriented. A major concern is getting the job done. People are very competitive and achievement-oriented.
- alternative D – The organization is very controlled and structured place. Formal procedures generally govern what people do.

2 area = Organizational Leadership

- alternative A – The leadership in the organization is generally considered to exemplify mentoring, facilitating, or nurturing.
- alternative B – The leadership in the organization is generally considered to exemplify entrepreneurship, innovation, or risk taking.

- alternative C – The leadership in the organization is generally considered to exemplify a no-nonsense, aggressive, results-oriented focus.
- alternative D – The leadership in the organization is generally considered to exemplify coordinating, organizing, or smooth-running efficiency.

3 area = Management of Employees

- alternative A – The management style in the organization is characterized by teamwork, consensus, and participation.
- alternative B – The management style in the organization is characterized by individual risk taking, innovation, freedom, and uniqueness.
- alternative C – The management style in the organization is characterized by hard-driving competitiveness, high demands, and achievement.
- alternative D – The management style in the organization is characterized by security of employment, conformity, predictability, and stability in relationships.

4 area = Organization Glue

- alternative A – The glue that holds the organization together is loyalty and mutual trust. Commitment to this organization runs high.
- alternative B – The glue that holds the organization together is commitment to innovation and development. There is an emphasis on being on the cutting edge.
- alternative C – The glue that holds the organization together is an emphasis on achievement and goal accomplishment.
- alternative D – The glue that holds the organization together is formal rules and policies. Maintaining a smooth-running organization is important.

5 area = Strategic Emphases

- alternative A – The organization emphasizes human development. High trust, openness, and participation persist.
- alternative B – The organization emphasizes acquiring new resources and creating new challenges. Trying new things and prospecting for opportunities are valued.
- alternative C – The organization emphasizes competitive actions and achievement. Hitting stretch targets and winning in the marketplace are dominant.
- alternative D – The organization emphasizes permanence and stability. Efficiency, control and smooth operations are important.

6 area = Criteria of Success

- alternative A – The organization defines success on the basis of development of human resources, teamwork, employee commitment, and concern for people.
- alternative B – The organization defines success on the basis of having the most unique or newest products. It is a product leader and innovator.
- alternative C – The organization defines success on the basis of winning in the marketplace and outpacing the competition. Competitive market leadership is key.
- alternative D – The organization defines success on the basis of efficiency. Dependable delivery, smooth scheduling and low-cost production are critical.

Based on the Cameron and Quinn methodology (1999) these six areas were completed by respondents twice. Firstly, they allocated 100 points across the individual alternatives in each area, based on which option they believed most accurately represented the current state-of-the-art. Based on this, it was possible to identify trends in managing existing culture. Then, respondents returned to the beginning. This time, by allocating 100 points, they indicated how they envisioned the company evolving over the next five years to achieve

exceptional success. Based on this, it was possible to identify the challenges related to corporate culture in management.

Subsequently, statistical software STATISTICA 12 was used to elaborate and analyze data. The results reached are presented in tables, using average values and confidence intervals (-95%; +95%). By averaging individual average values in all six partial areas, corporate culture type was calculated, firstly, in existing culture and subsequently in preferred culture. The significance of the differences was tested by inductive statistics using the Tukey HSD test, which allows multiple comparisons. Tukey HSD test was used because it focuses on the most significant value of the difference between two group means (Zaiontz, 2021). Differences were interpreted as statistically significant if $p\text{-level} < 0.05$. The aim of the research was to identify trends and challenges concerning corporate culture in managing the forestry and wood-processing industry in Slovakia. The following hypotheses were verified:

WH1: Trends in managing the forestry and wood-processing industry in Slovakia, concerning individual areas of existing corporate culture, vary over time.

WH2: Trends in managing the forestry and wood-processing industry in Slovakia concerning existing corporate culture vary over time.

WH3: Challenges in managing the forestry and wood-processing industry in Slovakia concerning individual areas of preferred corporate culture vary over time.

WH4: Challenges in managing the forestry and wood-processing industry in Slovakia concerning preferred corporate culture vary over time.

RESULTS AND DISCUSSION

Initially, the research focused on analyzing the existing corporate cultures in different areas to identify trends in managing Slovakia's forestry and wood-processing industry. The average values and confidence intervals were used. Based on the results presented in Table 1, it can be concluded that, with 95% confidence, when rating Alternative A in the area of Dominant Characteristics in 2020, respondents would give this alternative an average rating from 24.595 to 28.257 in similar research. The data from Table 1 further confirms that all alternatives were observed within the forestry and wood-processing industry under the area of Dominant Characteristics. However, respondents assigned the highest average rating to alternative D for the years 2020 and 2022. According to alternative D, respondents perceived enterprises as controlled and structured environments where formal processes were utilized for managing personnel. The findings also indicate a change in Dominant Characteristics in 2021 and 2023. During the period monitored, alternative A dominated. Respondents perceived the organization as a highly personal place akin to a multi-member family, fostering frequent employee interaction and shared experience.

Changes in the development of perception were also observed in the second area of investigation, focusing on Organizational Leadership. In 2020, respondents gave the highest average rating (from 26.238 to 30.002) to alternative B, indicating that leadership was characterized by entrepreneurship, innovation, and risk-taking, according to the respondents. In 2021, alternative A received the highest average rating (from 28.884 to 31.960) as respondents perceived leadership centered around mentoring, facilitation, and support. A change occurred in 2022, with alternative D achieving the highest average rating (from 28.912 to 34.777). Here, management was perceived to emphasize cooperation, order, and efficient functioning. In 2023, respondents reverted to the 2021 perception, emphasizing leadership focused on mentoring, facilitation, and support, with alternative A dominating.

Within the third area of investigation, which pertains to the Management of Employees, respondents consistently rated alternative A the highest in all years under examination (2020-2023) except for 2022. In their opinion, management styles in the forestry and wood-processing enterprises were characterized by teamwork, consensus-building, and fostering a sense of belonging. The change was noted in 2022 when alternative D reached the highest rating (from 30.277 to 35.797), reflecting a management style emphasizing job security, harmony, structured procedures, and stable relationships.

Additionally, the research explored the area of Organizational Glue. Findings indicate that, except for 2021, alternative D was predominantly observed over the monitored period. Respondents highlighted formal rules as a unifying element keeping forestry and wood-processing businesses together. While operational efficiency was crucial, loyalty and mutual trust emerged as essential elements binding businesses together in 2021, where alternative A dominated.

Analysis of the fifth area investigated (Strategic Emphases) showed relatively stable development between 2020 and 2022. Respondents consistently rated alternative D the highest throughout this period, focusing on permanence, stability, efficiency, control, and smooth operation within the forestry and wood-processing enterprises. However, perceptions changed in 2023 towards strategies emphasizing employee development, trust, openness, and ongoing inclusivity, leading to alternative A predominating that year.

A similar trend in development was observed in the final area examined, which focused on the Criteria of Success. Respondents indicated that in the years 2020 to 2022, businesses in the forestry and wood-processing industry defined success primarily through efficiency. Key factors included reliable deliveries, well-managed logistics, and cost-effective production, with alternative D being the prevailing choice. However, a change in perspective occurred in 2023, as alternative A achieved the highest average rating (from 25.118 to 30.568). Respondents perceived that companies defined success based on the growth of human resources, teamwork, employee commitment, and employee interest. The results reached are detailed in Table 1.

Tab. 1 Trends in managing the forestry and wood-processing industry concerning individual areas of existing corporate culture.

Individual areas of corporate culture	Year	Alternative A			Alternative B			Alternative C			Alternative D		
		\bar{X}	Confidence interval		\bar{X}	Confidence interval		\bar{X}	Confidence interval		\bar{X}	Confidence interval	
			-95%	+95%		-95%	+95%		-95%	+95%		-95%	+95%
1 area	2020	26.426	24.595	28.257	17.988	16.715	19.261	27.419	25.639	29.198	28.167	25.990	30.344
	2021	35.806	34.172	37.441	17.709	16.731	18.688	20.836	19.621	22.052	25.648	24.236	27.061
	2022	25.044	22.654	27.435	17.733	16.102	19.365	26.441	23.936	28.946	30.781	27.868	33.695
	2023	31.324	28.066	34.582	19.278	17.297	21.258	23.102	20.636	25.568	26.296	23.435	29.157
2 area	2020	22.245	20.735	23.754	28.120	26.238	30.002	24.480	22.598	26.362	25.155	23.456	26.854
	2021	30.422	28.884	31.960	24.812	23.387	26.236	16.857	15.691	18.023	27.909	26.352	29.466
	2022	23.826	21.570	26.082	23.493	21.432	25.553	20.837	18.630	23.044	31.844	28.912	34.777
	2023	27.537	25.102	29.972	23.065	20.530	25.600	22.861	20.442	25.280	26.537	23.939	29.135
3 area	2020	32.802	30.839	34.765	20.372	18.834	21.909	21.607	19.628	23.586	25.219	23.491	26.947
	2021	39.656	38.091	41.221	18.935	17.875	19.995	15.260	14.181	16.338	26.149	24.895	27.404
	2022	26.093	24.001	28.185	19.704	17.892	21.516	21.167	18.911	23.423	33.037	30.277	35.797
	2023	32.852	29.239	36.465	22.148	20.035	24.261	20.148	17.791	22.505	24.852	22.427	27.276
4 area	2020	25.299	23.422	27.175	19.518	18.174	20.861	26.059	24.346	27.772	29.125	26.955	31.294
	2021	31.149	29.609	32.690	18.974	17.916	20.032	22.351	21.190	23.511	27.526	26.124	28.928
	2022	20.385	18.420	22.350	20.481	18.560	22.403	28.211	25.644	30.779	30.922	28.260	33.584
	2023	26.389	23.670	29.108	22.546	20.366	24.726	24.213	21.773	26.653	26.852	24.305	29.399

5 area	2020	24.294	22.637	25.951	23.906	22.441	25.371	22.416	20.927	23.906	29.384	27.334	31.433
	2021	30.803	29.352	32.254	19.043	17.972	20.115	17.654	16.660	18.648	32.500	30.752	34.249
	2022	22.426	20.172	24.680	18.000	16.281	19.719	23.107	21.074	25.140	36.467	33.344	39.589
	2023	28.667	26.044	31.289	22.537	20.258	24.816	21.528	19.435	23.620	27.269	24.532	30.005
6 area	2020	26.518	24.477	28.558	19.141	17.711	20.571	21.718	20.088	23.347	32.624	30.458	34.789
	2021	31.169	29.560	32.778	16.275	15.290	17.260	17.357	16.295	18.419	35.199	33.394	37.003
	2022	21.189	19.042	23.336	19.363	17.582	21.144	19.704	17.737	21.670	39.744	36.467	43.022
	2023	27.843	25.118	30.568	21.880	19.405	24.354	24.491	22.221	26.760	25.787	23.309	28.265

* 1 area = Dominant Characteristics; 2 area = Organizational Leadership; 3 area = Management of Employees; 4 area = Organization Glue; 5 area = Strategic Emphases; 6 area = Criteria of Success

Subsequently, the initial findings underwent statistical testing to verify the assumption that trends in managing the forestry and wood-processing industry in Slovakia, particularly in individual areas of existing corporate culture, varied over time (WH1). Table 2 presents the results where statistically significant differences are highlighted. Based on the findings, the hypothesis WH1 was confirmed. Thus, it can be concluded that trends in managing the forestry and wood-processing industry in Slovakia differ over time across individual areas of existing corporate culture.

Tab. 2 Statistical testing of trends in managing the forestry and wood-processing industry concerning individual areas of existing corporate culture.

Indicator	Year	Alternative A				Alternative B				Alternative C				Alternative D			
		2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023
1 area	2020		0.000	0.837	0.139		0.986	0.995	0.810		0.000	0.898	0.117		0.204	0.391	0.847
	2021	0.000		0.000	0.167	0.986		1.000	0.668	0.000		0.000	0.612	0.204		0.004	0.991
	2022	0.837	0.000		0.046	0.995	1.000		0.745	0.898	0.000		0.364	0.391	0.004		0.250
	2023	0.139	0.167	0.046		0.810	0.668	0.745		0.117	0.612	0.364		0.847	0.991	0.250	
2 area	2020		0.000	0.717	0.053		0.022	0.010	0.068		0.000	0.038	0.827		0.130	0.000	0.928
	2021	0.000		0.000	0.464	0.022		0.764	0.811	0.000		0.007	0.005	0.130		0.039	0.920
	2022	0.717	0.000		0.328	0.010	0.764		0.997	0.038	0.007		0.742	0.000	0.039		0.116
	2023	0.053	0.464	0.328		0.068	0.811	0.997		0.827	0.005	0.742		0.928	0.920	0.116	
3 area	2020		0.000	0.000	1.000		0.393	0.941	0.694		0.000	0.988	0.864		0.841	0.000	0.998
	2021	0.000		0.000	0.008	0.393		0.889	0.162	0.000		0.000	0.031	0.841		0.000	0.905
	2022	0.000	0.000		0.022	0.941	0.889		0.485	0.988	0.000		0.955	0.000	0.000		0.001
	2023	1.000	0.008	0.022		0.694	0.162	0.485		0.864	0.031	0.955		0.998	0.905	0.001	
4 area	2020		0.000	0.008	0.957		0.928	0.834	0.223		0.003	0.394	0.764		0.578	0.680	0.739
	2021	0.000		0.000	0.092	0.928		0.469	0.084	0.003		0.000	0.731	0.578		0.094	0.989
	2022	0.008	0.000		0.041	0.834	0.469		0.606	0.394	0.000		0.189	0.680	0.094		0.310
	2023	0.957	0.092	0.041		0.223	0.084	0.606		0.764	0.731	0.189		0.739	0.989	0.310	
5 area	2020		0.000	0.587	0.142		0.000	0.000	0.828		0.000	0.933	0.945		0.126	0.001	0.839
	2021	0.000		0.000	0.693	0.000		0.754	0.101	0.000		0.000	0.054	0.126		0.081	0.134
	2022	0.587	0.000		0.021	0.000	0.754		0.037	0.933	0.000		0.786	0.001	0.081		0.003
	2023	0.142	0.693	0.021		0.828	0.101	0.037		0.945	0.054	0.786		0.839	0.134	0.003	
6 area	2020		0.002	0.007	0.938		0.005	0.997	0.286		0.000	0.349	0.354		0.302	0.001	0.047
	2021	0.002		0.000	0.418	0.005		0.012	0.001	0.000		0.147	0.000	0.302		0.043	0.001
	2022	0.007	0.000		0.029	0.997	0.012		0.412	0.349	0.147		0.037	0.001	0.043		0.000
	2023	0.938	0.418	0.029		0.286	0.001	0.412		0.354	0.000	0.037		0.047	0.001	0.000	

* 1 area = Dominant Characteristics; 2 area = Organizational Leadership; 3 area = Management of Employees; 4 area = Organization Glue; 5 area = Strategic Emphases; 6 area = Criteria of Success; Statistically significant differences are highlighted in color if p-level<0.05.

Furthermore, the research examined the development of existing corporate culture between 2020 and 2023. As shown in Table 3, respondents perceived that all corporate culture types were applied during the observation period, with hierarchy corporate culture receiving the highest rating in 2020 and 2022. Based on the results presented in Table 3, it can be concluded that, with 95% confidence, when rating the corporate culture hierarchy in 2020, respondents would give this culture an average rating of 27.093 to 29.465 in similar research. The company's core values revolved around regulations, order, internal sustainability, stability, and control. Management practices emphasized organized coordination, monitoring, smooth operation, predictability, efficiency, and procedure accuracy. Top-down communication prevailed, with formal rules acting as a binding

element. Successful leaders were viewed as effective coordinators and organizers who prioritized maintaining operational smoothness, stability, and efficiency. Employee management is primarily focused on ensuring job security.

The results presented in Table 3 further indicate that a clan corporate culture was prevalent in 2021 and 2023. Respondents noted that during these years, management emphasized fostering a sense of family within the company. Individuals' goals were aligned with corporate goals based on their trust in the business. Loyalty and traditions were seen as foundational to the company, and a high level of dedication was exhibited. Emphasis was placed on the long-term development of each individual, and significance was attributed to cohesion, morale, and the work environment. Success was understood in connection with the internal environment and care for personnel.

Tab. 3 Trends in managing the forestry and wood-processing industry concerning existing corporate culture.

Year	Clan corporate culture			Adhocracy corporate culture			Market corporate culture			Hierarchy corporate culture		
	\bar{x}	Confidence interval		\bar{x}	Confidence interval		\bar{x}	Confidence interval		\bar{x}	Confidence interval	
		-95%	+95%		-95%	+95%		-95%	+95%		-95%	+95%
2020	26.264	25.123	27.405	21.507	20.721	22.294	23.950	22.977	24.923	28.279	27.093	29.465
2021	33.168	32.096	34.239	19.291	18.623	19.959	18.386	17.724	19.048	29.155	28.154	30.157
2022	23.160	21.707	24.614	19.796	18.626	20.966	23.244	22.062	24.427	33.799	31.759	35.840
2023	29.102	27.537	30.667	21.909	20.820	22.997	22.724	21.519	23.928	26.265	24.870	27.661

The results pertaining to overall corporate culture underwent statistical analysis. The analysis confirmed hypothesis WH2, indicating significant interannual differences in the perception of corporate culture types. Statistically significant differences are highlighted in Table 4.

Tab. 4 Statistical testing of trends in managing the forestry and wood-processing industry concerning existing corporate culture.

Year	Clan corporate culture				Adhocracy corporate culture				Market corporate culture				Hierarchy corporate culture			
	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023
2020		0.000	0.016	0.204		0.000	0.068	0.976		0.000	0.776	0.629		0.724	0.000	0.535
2021	0.000		0.000	0.017	0.000		0.857	0.024	0.000		0.000	0.000	0.724		0.000	0.180
2022	0.016	0.000		0.001	0.068	0.857		0.164	0.776	0.000		0.963	0.000	0.000		0.000
2023	0.204	0.017	0.001		0.976	0.024	0.164		0.629	0.000	0.963		0.535	0.180	0.000	

* Statistically significant differences are highlighted in color if p-level<0.05.

Subsequently, the research investigated the development of the preferred corporate culture, which should dominate in the future in the forestry and wood-processing industry in Slovakia, posing a managerial challenge. The investigation initially focused on six partial areas of corporate culture before moving on to assessing the overall type of corporate culture. Based on the findings presented in Table 5, it can be stated that in the initial area of investigation, Dominant Characteristics, respondents preferred implementing tools associated with alternative A within a 5 to 10-year timeframe in the forestry and wood-processing industry. This alternative received the highest average rating throughout the period analyzed. Further, it can be concluded that, with a 95% confidence, when rating alternative A in 2020, respondents would give this alternative an average rating from 31.574 to 35.626 in similar research. As per alternative A, companies are envisioned to function like a close-knit family, fostering frequent employee interactions.

In the subsequent area, Organizational Leadership, respondents indicated a preference for leadership grounded in principles of coordinating, organizing, or smooth-running efficiency, with alternative D emerging as the dominant choice. A change was observed in the year 2021, where respondents favored the adoption of alternative A, emphasizing the importance of management focusing on mentoring, facilitation, or nurturing in the future.

Respondents agreed and demanded a management approach centered on teamwork, consensus, and participation. In the third area of examination, Management of Employees, respondents showed a preference for using alternative A.

Consensus was reached in the area of Organization Glue, with a call to implement tools associated with alternative A over a 5—to 10-year period. Loyalty and mutual trust were critical elements for fostering unity within the company. An exception was noted in 2022, when respondents highlighted the attainment of objectives as the key element in maintaining organizational cohesion, leading to a preference for alternative C.

According to the respondents, the strategies of enterprises in the forestry and wood-processing industry should focus on employee development, trust, openness, and continuous engagement. Throughout the entire period observed, alternative A was the preferred choice, except for 2022 when alternative D received the highest average rating (from 25.188 to 29.812). This suggests that strategies should prioritize permanence and stability. Emphasizing efficiency, control, and smooth operations should be crucial.

Similar findings were observed in the area of Criteria of Success. Results presented in Table 5 indicate that alternative A was preferred in 2020, 2021, and 2023 in the forestry and wood-processing industry. Success for these enterprises should be defined by the development of human resources, teamwork, employee commitment, and interest. In 2022, alternative D received the highest average rating (29.622 to 34.719), reflecting a demand for success linked to efficiency, reliable delivery, optimized logistics, and cost-effective production.

Tab. 5 Challenges in managing the forestry and wood-processing industry concerning individual areas of preferred corporate culture.

Areas of corporate culture	Year	Alternative A			Alternative B			Alternative C			Alternative D		
		\bar{x}	Confidence interval		\bar{x}	Confidence interval		\bar{x}	Confidence interval		\bar{x}	Confidence interval	
			-95%	+95%		-95%	+95%		-95%	+95%		-95%	+95%
1 area	2020	33.600	31.574	35.626	18.729	17.449	20.010	26.953	25.288	28.617	20.718	19.101	22.335
	2021	42.705	40.923	44.487	17.934	16.969	18.899	18.883	17.848	19.919	20.478	19.265	21.691
	2022	31.411	29.130	33.692	20.404	18.871	21.937	25.367	23.316	27.417	22.819	20.587	25.050
	2023	37.315	33.185	41.445	21.250	19.185	23.315	20.046	17.982	22.110	21.389	18.964	23.814
2 area	2020	26.419	24.744	28.094	27.856	26.054	29.658	15.847	14.375	17.319	29.878	27.810	31.945
	2021	33.548	32.042	35.054	25.725	24.339	27.110	13.660	12.772	14.548	27.068	25.546	28.589
	2022	27.407	25.236	29.579	26.093	23.986	28.199	14.407	12.781	16.034	32.093	29.507	34.678
	2023	28.083	25.290	30.877	23.537	20.898	26.176	20.222	17.751	22.694	28.157	25.021	31.294
3 area	2020	38.344	36.364	40.323	19.195	17.835	20.556	14.442	12.947	15.938	28.019	26.299	29.739
	2021	44.344	42.719	45.969	18.071	17.075	19.068	12.539	11.691	13.387	25.045	23.776	26.315
	2022	33.826	31.436	36.215	19.341	17.820	20.861	14.111	12.393	15.829	32.722	30.303	35.142
	2023	35.333	31.807	38.859	20.769	18.931	22.606	18.250	16.157	20.343	25.648	22.879	28.418
4 area	2020	31.871	29.956	33.785	21.353	20.063	22.643	25.318	23.693	26.943	21.459	19.832	23.086
	2021	38.468	36.806	40.129	20.325	19.300	21.350	19.097	18.046	20.149	22.110	20.900	23.321
	2022	26.063	23.941	28.185	22.519	20.809	24.228	26.437	24.333	28.541	24.981	22.890	27.073
	2023	34.972	31.542	38.403	19.611	17.489	21.733	21.528	19.641	23.415	23.889	21.122	26.656
5 area	2020	32.624	30.732	34.515	23.372	21.981	24.762	21.111	19.730	22.491	22.894	21.304	24.485
	2021	38.221	36.657	39.785	20.478	19.437	21.520	17.433	16.490	18.376	23.868	22.631	25.105
	2022	26.974	24.825	29.123	22.437	20.676	24.199	23.089	21.210	24.968	27.500	25.188	29.812
	2023	31.130	28.230	34.029	23.546	21.409	25.683	21.352	19.604	23.099	23.972	21.359	26.585
6 area	2020	34.112	32.062	36.161	19.808	18.488	21.128	19.774	18.404	21.145	26.306	24.499	28.113
	2021	37.581	35.953	39.209	17.587	16.632	18.542	15.719	14.741	16.698	29.113	27.615	30.611
	2022	27.304	24.964	29.643	21.226	19.647	22.805	19.300	17.580	21.020	32.170	29.622	34.719
	2023	30.889	27.677	34.101	22.537	20.210	24.864	20.833	19.029	22.638	25.741	23.183	28.299

* 1 area = Dominant Characteristics; 2 area = Organizational Leadership; 3 area = Management of Employees; 4 area = Organization Glue; 5 area = Strategic Emphases; 6 area = Criteria of Success.

Subsequently, the results underwent statistical testing. The outcomes presented in Table 6 support hypothesis WH3, indicating changes in the perception of partial areas of corporate culture over time whereas the interannual statistically significant differences were confirmed.

Tab. 6 Statistical testing of challenges in managing the forestry and wood-processing industry concerning individual areas of preferred corporate culture.

Indicator	Year	Alternative A				Alternative B				Alternative C				Alternative D			
		2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023
1 area	2020		0.000	0.611	0.437		0.754	0.366	0.291		0.000	0.562	0.000		0.996	0.391	0.983
	2021	0.000		0.000	0.101	0.754		0.042	0.071	0.000		0.000	0.888	0.996		0.213	0.955
	2022	0.611	0.000		0.108	0.366	0.042		0.944	0.562	0.000		0.015	0.391	0.213		0.883
	2023	0.437	0.101	0.108		0.291	0.071	0.944		0.000	0.888	0.015		0.983	0.955	0.883	
2 area	2020		0.000	0.914	0.856		0.235	0.620	0.140		0.039	0.524	0.015		0.127	0.538	0.876
	2021	0.000		0.000	0.031	0.235		0.993	0.666	0.039		0.864	0.000	0.127		0.005	0.959
	2022	0.914	0.000		0.990	0.620	0.993		0.628	0.524	0.864		0.001	0.538	0.005		0.364
	2023	0.856	0.031	0.990		0.140	0.666	0.628		0.015	0.000	0.001		0.876	0.959	0.364	
3 area	2020		0.000	0.036	0.567		0.523	0.999	0.708		0.088	0.989	0.042		0.034	0.005	0.620
	2021	0.000		0.000	0.000	0.523		0.553	0.218	0.088		0.348	0.000	0.034		0.000	0.988
	2022	0.036	0.000		0.928	0.999	0.553		0.795	0.989	0.348		0.034	0.005	0.000		0.004
	2023	0.567	0.000	0.928		0.708	0.218	0.795		0.042	0.000	0.034		0.620	0.988	0.004	
4 area	2020		0.000	0.003	0.531		0.616	0.708	0.655		0.000	0.796	0.112		0.921	0.039	0.546
	2021	0.000		0.000	0.382	0.616		0.119	0.960	0.000		0.000	0.433	0.921		0.079	0.739
	2022	0.003	0.000		0.001	0.708	0.119		0.261	0.796	0.000		0.031	0.031	0.039	0.079	0.943
	2023	0.531	0.382	0.001		0.655	0.960	0.261		0.112	0.433	0.031		0.546	0.739	0.943	
5 area	2020		0.000	0.002	0.905		0.005	0.840	0.999		0.000	0.256	0.998		0.790	0.004	0.939
	2021	0.000		0.000	0.004	0.005		0.222	0.165	0.000		0.000	0.030	0.790		0.016	1.000
	2022	0.002	0.000		0.279	0.840	0.222		0.907	0.256	0.000		0.688	0.004	0.016		0.281
	2023	0.905	0.004	0.279		0.999	0.165	0.907		0.998	0.030	0.688		0.939	1.000	0.281	
6 area	2020		0.040	0.000	0.511		0.032	0.529	0.236		0.000	0.971	0.893		0.097	0.001	0.994
	2021	0.040		0.000	0.014	0.032		0.001	0.002	0.000		0.001	0.002	0.097		0.140	0.363
	2022	0.000	0.000		0.466	0.529	0.001		0.828	0.971	0.001		0.764	0.001	0.140		0.026
	2023	0.511	0.014	0.466		0.236	0.002	0.828		0.893	0.002	0.764		0.994	0.363	0.026	

* 1 area = Dominant Characteristics; 2 area = Organizational Leadership; 3 area = Management of Employees; 4 area = Organization Glue; 5 area = Strategic Emphases; 6 area = Criteria of Success; Statistically significant differences are highlighted in color if p-level<0.05.

In the next stage, to identify the challenges in managing the forestry and wood-processing industry, the investigation focused on assessing the overall preferred type of corporate culture desired by employees for the company's future development. The results presented in Table 7 indicate a strong preference for a clan corporate culture in the 5 to 10-year horizon. This culture consistently received the highest average rating in individual years. According to employees in the forestry and wood-processing industry, characteristics typical of a clan corporate culture should dominate in these enterprises in the future. The management's challenge lies in fostering a shared vision among employees. Employees should view themselves as integral members of a cohesive and engaged "family". The workplace environment should mirror an extended family, promoting equal opportunities for all employees. Leadership should embody mentorship, with leaders serving as guides, advisors, or parental figures. Core values should revolve around teamwork, participation, communication, and consensus.

Tab. 7 Challenges in managing the forestry and wood-processing industry concerning preferred corporate culture.

Year	Clan corporate culture			Adhocracy corporate culture			Market corporate culture			Hierarchy corporate culture		
	\bar{X}	Confidence interval		\bar{X}	Confidence interval		\bar{X}	Confidence interval		\bar{X}	Confidence interval	
		-95%	+95%		-95%	+95%		-95%	+95%		-95%	+95%
2020	32.828	31.586	34.070	21.719	20.990	22.448	20.574	19.711	21.437	24.879	23.920	25.838
2021	39.144	37.991	40.298	20.020	19.384	20.656	16.222	15.640	16.804	24.614	23.793	25.434
2022	28.831	27.423	30.239	22.003	21.082	22.924	20.452	19.553	21.351	28.714	27.158	30.270
2023	32.954	31.171	34.736	21.875	20.779	22.971	20.372	19.268	21.476	24.799	23.253	26.345

Despite clan corporate culture consistently receiving the highest average rating, statistical analysis confirmed differences. Differences were also confirmed in the perception of other corporate culture types (adhocracy, market, hierarchy). The results in Table 8 confirm hypothesis WH4.

Tab. 8 Statistical testing of challenges in managing the forestry and wood-processing industry concerning preferred corporate culture.

Year	Clan corporate culture				Adhocracy corporate culture				Market corporate culture				Hierarchy corporate culture			
	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023
2020		0.000	0.002	1.000		0.004	0.971	0.998		0.000	0.998	0.996		0.980	0.000	1.000
2021	0.000		0.000	0.000	0.004		0.004	0.125	0.000		0.000	0.980			0.000	0.999
2022	0.002	0.000		0.056	0.971	0.004		0.999	0.998	0.000		1.000	0.000	0.000		0.012
2023	1.000	0.000	0.056		0.998	0.125	0.999		0.996	0.000	1.000		1.000	0.999	0.012	

* Statistically significant differences are highlighted in color if p-level<0.05.

Trends and challenges in managing the forestry and wood-processing industry were examined through the research focused on corporate culture conducted in Slovakia from 2020 to 2023. The Organizational Culture Assessment Instrument was used, a tool for measuring corporate culture that is commonly employed in English-speaking countries. This methodology has also been applied in studies by Balková and Jambal (2024), Sindakis *et al.* (2024), Igrét *et al.* (2023), Pancholi and Devkar (2023), Assens-Serra *et al.* (2022), and others. Only high organizational effectiveness can ensure the competitiveness and commercial success of the company, which in turn depends on the corporate culture having developed in the organization (Vrabcova and Urbancova, 2023; Nazipova *et al.*, 2017). In this context, the management must identify the corporate culture as it can improve corporate performance by providing meaning and purpose to daily work efforts. Corporate culture significantly influences the activities of employees, motivating them to achieve optimal results (Nazipova *et al.*, 2017; Landekic *et al.*, 2015; Teplická *et al.*, 2015).

The research findings pointed out that a hierarchy and clan corporate culture predominated in the forestry and wood-processing industry in Slovakia. These businesses typically exhibited a formalized and structured work environment that emphasized procedures and regulations, with formal rules serving as a cohesive element. Effective leaders were characterized as skilled coordinators and organizers who prioritized the smooth operation, stability, and efficiency of the organization. Success was defined by the reliability of deliveries, adherence to schedules, and cost-effectiveness. Employee management is primarily focused on ensuring job security. Similar findings were confirmed by Calderón *et al.* (2022), Gebretsadik (2022), and Caliskan and Zhu (2019), who noted the prevalence of hierarchy corporate culture.

Alongside the hierarchy corporate culture, clan corporate culture—named for its resemblance to family-type enterprises—was most commonly found in the forestry and wood-processing industry in Slovakia. The working environment was perceived as friendly, with employees sharing similar values. Leaders often took on the roles of teachers or counselors, and sometimes even acted as parental figures. The companies were strengthened by loyalty and tradition, and employees demonstrated a strong devotion to their organization. Emphasis was placed on the long-term development of each employee, with significant importance given to cohesion, morale, and the overall working environment. Success was viewed in relation to the internal environment and the care provided to employees. Teamwork, participation, and consensus were considered paramount. Clan corporate culture was also prevalent among a wide range of Czech businesses and trade unions across the country (Balková and Jambal, 2024), in public universities in Malaysia (Al Issa, 2019), and in junior high schools in Israel (Faddul *et al.*, 2019). The research by Vlăicu *et al.* (2019)

using a similar methodology in Romania reached similar conclusions, highlighting the prevalence of a hierarchy culture followed closely by a clan corporate culture.

Employees in the forestry and wood-processing industry in Slovakia expressed a desire for clan corporate culture to be maintained in the future. According to the Cameron and Quinn methodology (1999), the challenge for company management is to foster a friendly working environment that resembles an extended family, where employees share common values. The fundamental values should revolve around teamwork, collaboration, communication, and consensus. Employees should view themselves as integral members of a dynamic and committed family. Emphasizing each employee's long-term development should be essential. The cohesion, morale, and work environment of the businesses should be fortified by loyalty and traditions, fostering a solid commitment to the company. Leadership should adopt a mentoring approach, with leaders acting as mentors, advisors, or parental figures. Success should be gauged based on the internal environment and the care devoted to each employee, as human capital plays a crucial role in increasing the productivity, output of an organization, and competitive advantage. It is confirmed by the research of Hitka *et al.* (2023), Kucharcíková *et al.* (2015) and Übius and Alas (2009), according to which human capital is involved in the creation of the market value of the company and also represents the most valuable source of company. Similar challenges are highlighted in the research conducted by Balková and Jambal (2024), Dobrin *et al.* (2021), which suggests that clan corporate culture should prevail in companies moving forward. According to the research by Bing-You *et al.* (2019), Dostiyrova (2016), and Goula *et al.* (2014), a clan corporate culture should be applied in the future. This culture emphasizes shared values, loyalty, and traditions that foster a friendly work environment. Similarly, Andrianu (2020) found that clan corporate culture is preferred due to its strong focus on employees. These findings align with research by Belias *et al.* (2015), which indicates that most employees prefer working in a friendly environment characterized by mutual trust, informal relationships, consideration of personal ambitions, and recognition of teamwork. Cucek and Kac (2020) add that employees favor a clan culture, increasing satisfaction. These conclusions are supported by the research of Qin *et al.* (2015), emphasizing that human relationships and social connections within an organization contribute to a harmonious work environment, uniting management and employees in achieving strategic objectives.

CONCLUSION

The current business environment is characterized by trends such as globalization, the industrial revolution, digitization, artificial intelligence, sustainability, and others, impacting business operations across all industries. The primary trend in managing the forestry and wood-processing industry in Slovakia concerning corporate culture was a combination of elements of hierarchy and clan corporate culture. The challenge and, at the same time, the recommendation for the management of the forestry and wood-processing industry in Slovakia is to implement a clan corporate culture further. It is suggested that managers cultivate a work environment that mirrors an extended family, offering equal opportunities to all employees. A friendly working environment, where employees share common values, should be supported. Leaders should act as teachers or advisors and sometimes even as parental figures. Management should take steps to ensure that loyalty and tradition are the foundational elements that unite the business. High levels of devotion to the company should be encouraged, and the long-term development of each employee should be prioritized. Great importance should be placed on cohesion, morale, and the working environment.

Success should be understood in relation to the internal environment and the care provided to employees.

Research findings provide a picture of trends and challenges in managing concerning corporate culture, filling the gap in understanding existing and preferred corporate culture in the forestry and wood-processing industry in Slovakia. The research result can benefit managers when creating a suitable corporate culture. The focus was placed on the forestry and wood-processing industries, which can be considered a research limitation. Therefore, the future research direction could focus on examining corporate culture in different industries in Slovakia, as well as from the perspective of socio-demographic factors, due to the importance of respecting the individual characteristics of employees when developing, enhancing, and aligning with corporate culture, as it can influence employee performance and subsequently, the company's overall outcomes.

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