

WORKING TIME FLEXIBILITY IN SHIFT REGIMES: AN ANALYSIS OF SHIFT PLANNING SYSTEM IN A SELECTED AUTOMOTIVE COMPANY

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Abstract

Shift work is a prevalent practice in many industries, including the automotive sector, where continuous operations are necessary to meet production demands. The automotive industry is synonymous with constant production demands, as manufacturing processes often operate 24/7. As such, the conventional fixed working time hours model may no longer be optimal. However, the rigid nature of shift work can often lead to challenges in maintaining work-life balance and employee job satisfaction. The paper examines the concept of working time flexibility in shift regimes, with a particular emphasis on the shift planning system. The objective is to explore the benefits and challenges associated with implementing flexible working hours in a shift-based environment. The study draws on relevant literature from the field of human resource and workforce management, with an emphasis on articles indexed in the Web of Science or Scopus and on own analysis of a selected automotive company. The aim of the paper is to suggest shift planning recommendations enhancing overall job satisfaction and company performance in a selected automotive company.

Key words: working time, flexibility, shift work, job satisfaction, company performance

JEL Code: J22, J53, J81

Introduction

Shift work is a prevalent practice in many industries, including the automotive sector, where continuous operations are necessary to meet production demands. The automotive industry is synonymous with constant production demands, as manufacturing processes often operate 24/7. As such, the conventional fixed working time hours model may no longer be optimal. However, the rigid nature of shift work can often lead to challenges in maintaining work-life balance and employee job satisfaction. To address these concerns, organizations have started

exploring the concept of working time flexibility in shift regimes, aiming to enhance overall job satisfaction and company performance.

This paper focuses on analyzing the shift planning system in a selected automotive company and aims to suggest recommendations for improving shift planning to enhance job satisfaction and overall company performance. The primary objective is to explore the benefits and challenges associated with implementing flexible working hours in a shift-based environment.

The implementation of working time flexibility in shift regimes has gained attention due to its potential to improve employee satisfaction, work-life balance, and productivity. By providing employees with more control and autonomy over their working hours, organizations can create an environment that promotes greater satisfaction, leading to increased motivation and engagement (Lott, 2015).

However, introducing flexible working hours in a shift-based environment is not without its challenges. Shift planning becomes more complex when considering individual preferences, ensuring proper staffing levels, and maintaining operational efficiency. Balancing the needs of the organization with the preferences and availability of employees requires careful consideration and strategic planning.

By analyzing the benefits and challenges associated with implementing flexible working hours in a shift-based environment, this paper aims to provide valuable insights and recommendations for the selected automotive company. These recommendations are focused on enhancing job satisfaction and overall company performance by optimizing the shift planning system.

1 Research methodology

The research methodology was designed to comprehensively investigate the shift planning system within the selected automotive company. The study utilized a mixed-methods approach, incorporating literary research, analysis of the selected company's shift planning system, staff interviews and survey, synthesis of findings, and deductive reasoning to address the research objectives and answer hypothesis.

The first step involves conducting a comprehensive literature review on working time flexibility, shift planning systems, and their impact on employee satisfaction and company performance. Relevant scholarly articles, research papers, and books were gathered from databases like Web of Science and Scopus. This literature review provided a theoretical

framework for understanding the concepts and theories related to working time flexibility and shift planning systems.

To gain a deeper understanding of the shift planning system and its impact on job satisfaction and company performance, a specific automotive company was selected as a case study. The company was chosen from South Moravia region based on its size, shift work practices, and availability of relevant data. The analysis involved examining the existing shift planning system, policies, and procedures within the organization. Researchers observed the daily operations of the company, focusing on how the shift planning system was implemented, the role of supervisors, and any anomalies that or issues that arose during the shifts.

To gather firsthand insights and perspectives on the shift planning system, a series of structured interviews were conducted with a sample of 24 employees (18 shift workers, 4 shift leaders, 1 production manager, 1 HR manger) from different departments and shifts. These unstructured interviews explored their experiences, challenges, and suggestions related to working time flexibility and the shift planning system. Ethical considerations were carefully addressed throughout the research process. Informed consent was obtained from all interview participants, ensuring their anonymity and confidentiality.

The data collected from the literature review, analysis of the selected automotive company, staff interviews, and observation were synthesized and analyzed. This involved identifying common themes, patterns, and issues related to working time flexibility and the shift planning system. The findings were compared and contrasted with the existing literature to draw conclusions and make recommendations.

To test whether time flexibility is more important for women than for men with a significance level (alpha) of 0.01, it was used a chi-squared test for independence. This test helped to determine whether there is a statistically significant association between gender and the response to the question about welcoming the time change of the shift model.

Tab. 1: Observed frequencies from company conducted survey

	Yes	No	Don't know	Σ
For Men	179	82	95	356
For Women	429	149	74	652

Source: Selected company survey

Tab. 2: Hypothesis test

Null hypothesis H0	There is no association between gender and the response to the question about welcoming the time change of the shift model.
Alternative hypothesis HA	There is an association between gender and the response to the question about welcoming the time change of the shift model.
Chi square statistic	40.04
Critical chi-square value ($\alpha = 0.01$ and $df = 2$)	9.210
Result	Comparing the calculated chi-squared statistic (40.04) to the critical value (9.210) at $\alpha = 0.01$ with $df = 2$, we find that the calculated statistic is much greater than the critical value. Since chi-squared statistic is significantly greater than the critical value, we reject the null hypothesis. This suggests that there is a statistically significant association between gender and the response to the question about welcoming the time change of the shift model.

Source: Authors

It is important to acknowledge the limitations of this study. The analysis is limited to a single automotive company, which may not be representative of the entire industry. Additionally, the findings and recommendations are context-specific and may not be directly applicable to other organizations. The reliance on secondary data and staff interviews may introduce biases and limitations in terms of data accuracy and generalizability.

2 Working time flexibility in shift regimes

Working time flexibility is a concept that refers to the ability of employees to have control over when and how they work, within certain parameters set by the employer. In shift regimes, working time flexibility becomes even more crucial due to the varying and non-traditional working hours.

Shift work involves a schedule where employees work in different shifts, such as morning, evening, or night shifts, often in a rotating pattern. This type of work arrangement is common in industries that require continuous operations, such as healthcare, transportation, manufacturing, or hospitality. Working time flexibility in shift regimes aims to provide employees with options to customize their working hours, while still ensuring the operational needs of the organization are met.

There are several dimensions to consider when conceptualizing working time flexibility in shift regimes. The first dimension is the flexibility in start and end times of shifts. Traditionally, shift work has predetermined start and end times, but with increased

flexibility, employees may have the option to choose their preferred start and end times within certain limits. This allows employees to align their work schedule with their personal commitments or preferences.

The second dimension is the flexibility in the duration of shifts. In some shift regimes, employees work fixed-length shifts, while in others, they have the option to work shorter or longer shifts. This flexibility can be beneficial for employees who may have constraints on their availability or who prefer to work fewer hours on certain days.

Another dimension to consider is the flexibility in shift patterns. Shifts can be organized in various patterns, such as rotating, split, or compressed shifts. Rotating shifts involve employees working different shifts on a rotating basis, allowing for a fair distribution of different working times. Split shifts involve dividing the workday into two or more segments, with breaks in between. Compressed shifts involve working longer hours per day but fewer days per week. Allowing employees to have some control over their shift pattern can enhance their work-life balance and overall satisfaction.

2.1 Benefits of working time flexibility in shifts

Working time flexibility in shift work has several benefits for both employees and employers. It not only enhances work-life balance but also contributes to employee satisfaction, productivity, and overall well-being.

First and foremost, working time flexibility allows employees to have greater control over their work schedule (Arı & Erdoğan, 2022). This enables them to better manage their personal commitments, such as childcare, education, or other obligations outside of work (Jaros, Melichar & Svadlenka, 2014). By having the ability to customize their working hours, employees can achieve a better work-life balance, reducing stress and improving their overall quality of life (Costa & Silva, 2019).

Moreover, working time flexibility in shift work can lead to higher employee satisfaction and morale. When employees have the freedom to choose their shifts or have options for shift swaps, they feel empowered and valued by the organization. This sense of autonomy and flexibility fosters a positive work environment, leading to increased job satisfaction and loyalty.

The flexibility of working time in shift regimes also promotes employee well-being and health. Shift work is often associated with disrupted sleep patterns and fatigue. By allowing employees to adjust their schedules to better suit their individual needs, organizations can help mitigate the negative effects of shift work on employees' physical and

mental well-being (Aydin, 2022; Sánchez-Marín, Lozano-Reina & Beglaryan, 2022). This, in turn, can reduce absenteeism, improve job performance, and enhance overall employee health.

2.2 Challenges of working time flexibility in shifts

While working time flexibility in shift work offers numerous benefits, it also presents several challenges that need to be addressed. These challenges can arise due to the complex nature of shift work and the need to balance employee preferences with operational requirements.

One of the primary challenges is ensuring fair and equitable distribution of shifts. With increased flexibility, there is a risk of certain employees consistently obtaining preferred shifts, while others may be left with less desirable ones. This can lead to feelings of unfairness and dissatisfaction among employees, potentially impacting morale and teamwork. It is crucial for organizations to establish transparent and equitable processes for shift allocation, considering factors such as seniority, performance, and employee preferences.

Another challenge is maintaining consistent coverage and meeting operational demands. In shift work, specific shifts are often designed to ensure continuous operations or meet customer needs (Gong, Wang, & Jiao, 2019). With increased flexibility, there is a risk of gaps in coverage if employees are allowed to choose shifts that do not align with operational requirements. Organizations must strike a balance between accommodating employee preferences and ensuring sufficient staffing levels to meet business needs (Oladimeji, Abdulkareem & Ishola, 2023). This may involve implementing scheduling algorithms or systems that optimize shift assignments while considering operational constraints.

Furthermore, coordinating shift swaps can be a challenge in working time flexibility. While allowing employees to exchange shifts can enhance their work-life balance, it requires effective communication and coordination among employees. It can be challenging to find suitable replacements and ensure that shift changes do not disrupt workflows or cause staffing shortages. Establishing clear guidelines and processes for shift swaps, along with effective communication channels, can help mitigate these challenges.

Another significant challenge is managing employee fatigue and ensuring adequate rest periods. Shift work already poses a risk of fatigue due to irregular working hours and disrupted sleep patterns (Howard, 2022). Increased flexibility can sometimes lead to employees working longer hours or taking on back-to-back shifts, potentially compromising their well-being and performance. Organizations must monitor and regulate working hours to prevent excessive fatigue, adhering to legal requirements and industry best practices for rest periods.

Moreover, implementing working time flexibility in shift regimes can be challenging from a technological standpoint. Organizations may require robust scheduling systems or software to handle the complexities of flexible shift arrangements. These systems should be user-friendly, capable of accommodating different shift patterns, and capable of providing real-time updates to employees regarding their schedules and shift changes (van Hulst, den Hertog, & Nuijten, 2017).

3 Shift planning system in selected automotive company

Shift planning is a critical aspect of workforce management in the automotive industry. The shift planning system in the selected automotive company can be defined as a semi software-based solution that facilitates the creation, allocation, and management of work shifts for employees. It incorporates various components and functionalities (Timofeeva, 2023).

Shift Scheduling: This component allows company to create and define different types of shifts based on their production requirements. It enables the scheduling of regular shifts, overtime shifts, and special shifts, such as night shifts or weekend shifts. Concerning the length of shift, the most used is a 12 hours shift. The shift scheduling component provides a visual interface in excel or a special software where managers can assign shifts to employees and view the overall shift distribution.

Demand Forecasting: A vital component of the shift planning system is demand forecasting. It utilizes historical data, production forecasts, and other relevant inputs to estimate the workforce requirements for different shifts and time periods. By accurately predicting the demand for labor, the system enables automotive companies to allocate the right number of employees to each shift, avoiding overstaffing or understaffing situations.

Shift Rotation and Patterns: Automotive company employs shift rotation and patterns to distribute shifts fairly among employees (fixed team cycling system) regardless of a person's circadian rhythm. The shift planning system allows for the creation and management of rotation schedules, ensuring that employees experience a balanced distribution of shifts, including day shifts, evening shifts, and night shifts. It also enables the implementation of specific shift patterns, such as 12-hour shifts usually per whole week.

Shift Swapping and Absence Management: The shift planning system does not facilitate employee-initiated shift swapping and does not provide a platform for managing absences and replacements. Employees can request shift swaps, but they organize a change of shift between themselves, possibly with the help of an orderly.

Methods employed within a shift planning system in the selected automotive company include:

Manual Input: This method involves manually inputting employee data, shift requirements, and other relevant information into the shift planning system.

Automated Integration: With this method, the shift planning system integrates with other existing systems in the company, such as production planning or human resources systems (attendance system). This integration enables seamless data exchange, real-time updates, and full or semi-automatic synchronization of information, reducing manual effort and increasing accuracy.

Algorithmic Optimization: Advanced shift planning systems employing algorithms and optimization techniques to generate optimal shift schedules automatically is missing.

4 Future directions and recommendations

As the automotive industry continues to evolve, so too should the approaches to working time flexibility and planning in shift regimes. In order to address the changing needs and demands of the industry and its workforce, it is important to consider future directions and make recommendations for improvement (Timofeeva, 2023).

Embrace Technology and Automation: As technology advances, there is a great opportunity for the selected automotive company to leverage automation and digital solutions in working time flexibility and planning. Implementation of advanced scheduling software, artificial intelligence algorithms, and data analytics can help optimize shift planning processes, improve accuracy, and reduce administrative burdens (Ansola, García & de las Morenas, 2016). This would enable automotive companies to respond more quickly to changes in production demands and employee preferences, while also minimizing errors and reducing costs. Recommendation: Invest in a special workforce management software.

As automation becomes more prevalent in manufacturing processes, there is a need to balance the use of automated systems with human expertise in shift planning. Human planners can provide the necessary context and judgment to handle exceptions and ensure that the workforce remains agile and responsive (Balková, Lejsková & Ližbetinová, 2022). Recommendation: Create a position of workforce planner in the organization and train them regularly.

Flexibility in Shift Duration: Offering options for shorter or longer shifts can accommodate employees' personal preferences and needs, promoting work-life balance. This

could be particularly beneficial for employees with specific constraints, such as those who require shorter shifts due to health conditions or those who prefer longer shifts to have more consecutive days off. Recommendation: Use all available and feasible planning instruments or methods increasing level of flexibility and offering employees a choice in a shift length.

Employee Involvement and Empowerment: Involving employees in the shift planning process can enhance engagement and satisfaction. The selected automotive company should consider implementing mechanisms for employee input, such as allowing them to express shift preferences or participate in shift allocation decisions through a collaborative platform (Katsabian & Davidov, 2023). Developing digital platforms that allow employees to have more control over their schedules is the future of shift planning in Czech Republic. This approach, in western countries known as self-rostering or self-scheduling, ensures that employees' needs and preferences are considered and helps foster a sense of ownership and empowerment (Urban, Dvorakova, Krastins, 2020). Recommendation: Create employee-centric policies and implement self-rostering technics.

Health and Well-being Initiatives: The automotive company should prioritize health and well-being initiatives within their shift planning strategies (Bugvi, Hameed, & Ghauri, 2022). This should include Roster risk profile analysis and providing access to wellness programs. Recommendation: Create and evaluate shift models with respect to social and physical criteria and establish collaborative decision-making.

Conclusion

Working time flexibility in shift regimes is a dynamic and multifaceted concept that fosters a harmonious relationship between employees and organizations. As industries evolve and adapt to a rapidly changing business landscape, understanding and implementing working time flexibility becomes increasingly essential for individual well-being and organizational success. It is a concept that embodies the principles of adaptability, accommodation, and empowerment, aiming to create a win-win situation where employees can achieve a satisfying work-life balance while organizations maintain their operational efficiency. In the subsequent sections of this paper, we delve deeper into the practical applications and implications of working time flexibility within the context of a selected automotive company and propose corresponding recommendations.

The research subject was also supported with a hypothesis. A statistically significant association was found between gender and the response to the question about welcoming the

time change of the shift model. A questionnaire survey conducted in a selected automotive company has also shown that flexibility of working time is essential to employees' well-being and work-life balance. The time flexibility factor is in the selected automotive company more significant for women in terms of gender.

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