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Evaluation of Health Insurance Companies' Working Models: AHP and COPRAS Based Decision Support Approach

Sağlık Sigorta Şirketlerinin Çalışma Modellerinin Değerlendirilmesi: AHS ve COPRAS Tabanlı Karar Destek Yaklaşımı

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ABSTRACT

Objective: The aim of this study is to determine the importance of the criteria that influence the working models of health insurance companies and to provide a decision support approach for selecting the most appropriate working model.

Methods: Working models and the criteria influencing them were identified through a literature review. Their weights and rankings were evaluated by 5 experts from the fields of health management, occupational health and safety, management and strategy, banking and insurance, and business administration. The analytical hierarchy process (AHP) method was used to determine the importance of the criteria, and the complex proportional assessment (COPRAS) method was used to rank the study models.

Results: According to the AHP results, the weights of the most important criteria affecting the working models of health insurance companies were found to be 23.04% cost effectiveness, 20.38% customer satisfaction, and 18.84% employee productivity. According to the COPRAS results, the most appropriate working models for health insurance companies were identified as 18.02% hybrid working, 15.76% flexible working, and 14.58% part-time project-based working.

Conclusion: To popularize these models, companies should establish a strong technological infrastructure. Remote work support, cloud systems, virtual private network, video conferencing tools, and project management software should be integrated. Evaluation should focus on work output rather than hours. Data security policies must be clear. An authorized access

ÖZ

Amaç: Bu çalışmada sağlık sigorta şirketlerinin çalışma modellerini etkileyen kriterlerin önem derecelerinin belirlenmesi ve en uygun çalışma modelinin seçimi için bir karar destek yaklaşımı oluşturulması amaçlanmıştır.

Yöntemler: Çalışma modelleri ve etkileyen kriterler alan yazın taraması ile tespit edilerek; ağırlıkları ve sıralamaları sağlık yönetimi, iş sağlığı ve güvenliği, yönetim ve strateji, bankacılık ve sigortacılık ve işletme alanlarından 5 uzman tarafından değerlendirilmiştir. Kriterlerin önem derecelerinin tespiti için analitik hiyerarşi süreci (AHS) yöntemi; çalışma modellerinin sıralamaları için ise karmaşık orantılı değerlendirme (COPRAS) yöntemi kullanılmıştır.

Bulgular: AHS sonuçlarına göre; sağlık sigorta şirketlerinin çalışma modellerini etkileyen en önemli kriterlerin ağırlıkları %23,04 maliyet etkinliği, %20,38 müşteri memnuniyeti ve %18,84 çalışan verimliliği olarak bulunmuştur. COPRAS sonuçlarına göre ise sağlık sigorta şirketleri için en uygun çalışma modelleri ağırlıkları %18,02 hibrit çalışma, %15,76 esnek çalışma ve %14,58 yarı zamanlı-proje bazlı çalışma olarak belirlenmiştir.

Sonuç: Sonuç olarak, bu modellerin yaygınlaştırılması için uzaktan çalışmayı destekleyen güçlü bir teknolojik altyapı, bulut tabanlı sistemler, sanal özel ağ çözümleri, video konferans araçları ve proje yönetimi yazılımları gibi araçların kullanımı sürece entegre edilmelidir. Çalışma saatlerinden ziyade iş çıktısına odaklanan bir değerlendirme sistemi kurulmalıdır. Esnek ve proje bazlı çalışanlar için veri güvenliği politikaları net bir şekilde tanımlanarak yetkilendirilmiş erişim modeli benimsenmelidir. Ekiplerin etkin

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model should be used. Online project management platforms are needed for team management. Project-based payment systems should be implemented. Companies must analyze their processes. They should match models to departments and tasks. A strategic combination of models can boost employee satisfaction and operational efficiency.

Keywords: Health management, health facilities, health insurance companies, working model, decision-making techniques

yönetimi için çevrimiçi proje yönetim platformları kullanılmalı ve proje bazlı hakediş ödeme sistemleri devreye alınmalıdır. Bu doğrultuda, sağlık sigorta şirketlerinin öncelikle iş süreçlerini analiz ederek hangi modelin hangi departman veya görev için daha uygun olduğunu belirlemeleri gerekir. Şirketlerin, bu modelleri stratejik bir yaklaşımla harmanlayarak hem çalışan memnuniyetlerini artırması hem de operasyonel verimliliklerini sağlayabilmesi mümkündür.

Anahtar Kelimeler: Sağlık yönetimi, sağlık tesisleri, sağlık sigorta şirketleri, çalışma modeli, karar verme teknikleri

Introduction

With the rapid advancement of technology and the increasing impact of digitalization on business, traditional office-based working models are undergoing significant changes. Alternative working styles, such as remote working, hybrid working, and digital nomad models, have become increasingly common, particularly in the wake of the pandemic. Working models have significant impacts not only on the motivation and productivity of employees, but also on companies' operational processes and customer satisfaction (CS). In a market where innovative technologies and service delivery methods significantly affect consumer decisions, health insurance companies need to adapt their working models to effectively incorporate technology to remain competitive (1,2). Integration of different working models into processes is important to create integrated service ecosystems that can better meet the needs of consumers. The decision-making process regarding operating models in health insurance companies is related to various theoretical frameworks as well as their practical importance. When these theories are considered, organizational change theory suggests that organizations need to adapt their structures and processes in response to technological innovations and external environmental pressures (3,4). Strategic management theory, which includes concepts such as competitive advantage and cost leadership, explains how operational decisions such as choosing an appropriate operating model are important for maintaining organizational performance and competitiveness (5,6). Furthermore, digital transformation theory emphasizes the integration of digital tools and the importance of data security in new operating models, underlining the role of technology in redesigning business operations (7,8). These theories provide a basic framework for understanding the criteria evaluated in this study and interpreting empirical findings in a broader organizational and strategic context. Furthermore, decision-making processes in health insurance companies are sometimes influenced by factors such as limited information, time pressure, and managers' differing interpretations of the external environment. This situation aligns with the theory of bounded rationality. Indeed, the choice of different working models varies depending on factors such as organizational culture, structure, size, resource and talent capital, and external environmental conditions, necessitating a contingency approach. Comparison of different working models in health insurance companies directly affects the performance of employees and organizational structures (9,10). In this context, it is thought that examining the working models specific to health insurance companies will make a significant contribution to both academic literature and industry practices. The use of multi-criteria decision-making (MCDM) techniques also allows decision makers in health insurance companies to solve the complex and multi-dimensional problems they face in a more rational and evidence-based way (11).

Health insurance companies apply several different working models, each with its pros and cons. Full-time office work is the traditional employment model that asks employees to work standard hours at a central location. This model allows for direct supervision and collaboration among all team members, which means improved communication and teamwork (12). Of course, these benefits come at the price of job dissatisfaction because rigidity in schedules and the stress of commuting negatively affect employee morale (13). The hybrid working model blends in-person and remote work modalities, allowing employees to choose where and when they work. This flexibility has the potential to improve job satisfaction and work-life balance by making employees feel more valued (14). In such models, performance may improve due to increased employee autonomy and satisfaction, but it should not be overlooked that it may also cause difficulties in communication and maintaining corporate culture (15). The rise of full-time remote work has occurred in full-time positions, especially after the coronavirus disease 2019 (COVID-19) pandemic. Working remotely allows individuals to save money in some areas, such as commuting and gas, and also makes it easier to maintain a balanced life. Yet, working remotely can lead to the feeling of being disconnected and isolated from the workplace and one's coworkers. This disconnect can lead to poor communication that might affect remote workers' teams and the individual remote workers' health (16). There is also a model of work that is for those who wish to travel to different places and work. This model is called the digital nomad model, and it allows for multiple remote work locations. These types of working models allow for a lot of creativity and increased job satisfaction. However, it may cause some operational inefficiencies in terms of sustainable communication and adapting to different time zones (17,18). Shift work (SW) can be implemented in health insurance companies that provide 24/7 service. It is valuable in terms of providing uninterrupted and continuous service, but it is also risky in terms of causing employee fatigue and health problems due to working hours (19,20). Flexible working models allow employees to modify their working hours in accordance with their demands (21,22).

This increases job satisfaction and commitment and can also be effective in driving down costs and boosting motivation for businesses (23). Models that are part-time and project-based allow individuals to work in a manner that is much more temporary and without the fixed hours or commitments that some jobs require. These individuals can also adapt their work to personal responsibilities and interests. This model can potentially drive up job satisfaction, but it also lacks the model's push toward stability that is associated with traditional employment. Risks can also accumulate under this model that are associated with long-term financial security and employee loyalty to organizations (24).

Furthermore, the performance of the work models of health insurance companies is affected by many criteria. These are noteworthy in the literature. CS plays a very important role in the health insurance sector. However, it has been revealed that service quality and the perceived value of health insurance are very important determinants of CS (25,26). Similarly, a motivated and productive workforce can improve service delivery and thus promote CS (27,28). Indeed, it is emphasized that workplace environments that support work-life balance are strongly associated with increased productivity and employee well-being (29-31). It shows that a well-established data security infrastructure and crisis management plans can increase operational flexibility and thus facilitate better service delivery and customer retention (32,33). It is emphasized that cost efficiency can be increased without compromising service quality with innovations in insurance products and models. Indeed, organizations that adopt data-driven approaches and new technologies tend to effectively reduce increasing operational costs (34). Transparent communication regarding costs, benefits, and claim processes increases customer trust and satisfaction (35). On the other hand, team communication and collaboration are among the key operational components that can increase overall service efficiency. Effective communication within teams fosters a collaborative environment that can ensure timely decision-making and more effective service delivery (36,37). Companies that regularly conduct risk analyses and create contingency plans are better equipped to cope with unexpected disruptions, ensure service continuity, and protect their customer base during crises (38,39). It is underlined that these strategies must be integrated into the core operational framework and working models of health insurance companies to ensure long-term sustainability and competitiveness in the insurance market (40).

In this direction, this study aimed to determine the importance of the criteria affecting the working models of health insurance companies and to create a decision support approach for the selection of the most appropriate working model. This study is conducted within the context of the Turkish health insurance market, which operates under a mixed system involving both public and private health insurance providers. Although many working models are globally comparable, the organizational structures and regulatory frameworks relevant to health insurance in Türkiye have unique characteristics shaped by the complementary role of private insurance alongside the social security institution. Therefore, the findings are primarily contextualized within the Turkish health insurance sector.

Methods

Type and Design of the Research

This research is a quantitative study conducted to create a decision support approach for the selection of the most appropriate working model for health insurance companies. In the study, the analytical hierarchy process (AHP) and complex proportional assessment (COPRAS) methods, which are MCDM approaches, were used. Therefore, the research design is descriptive and cross-sectional. The research scope focuses on health insurance companies operating in Türkiye. Thus, expert evaluations and data collected in this study reflect the specific characteristics, regulations, and operational conditions of the Turkish health insurance market.

Determination of Working Models and Criteria

In the study, the working models of health insurance companies and the criteria affecting the models were grouped under seven categories as a result of the literature review and are expressed in Tables 1,2 with their explanations and sources. The selection of criteria and the use of AHP and COPRAS methods are consistent with organizational change theory, which suggests that systematic decision-making processes are essential for organizations facing complex environmental shifts (3), and with strategic management theory, which underlines the strategic importance of operational decisions for competitive advantage (5,6).

In order to determine the weights of the criteria affecting the working models, 5 experts from the fields of health management, occupational health and safety, management and strategy, banking and insurance, and business were consulted through AHP questionnaires. AHP questionnaires consist of questions based on pairwise comparisons with importance levels ranging from 1 to 9. In the next stage, the COPRAS method was used in line with the weighted criteria to determine the most beneficial working models for health insurance companies. Table 3 provides detailed information about the experts.

Statistical Analysis

This study employs a two-stage MCDM approach. In the first stage, the AHP was used to determine the relative importance (weights) of evaluation criteria through pairwise comparisons and consistency checks. The eigenvector weights obtained from AHP represent the ratio scale results expressing the relative importance of the criteria to each other (41). In the second stage, the weights obtained from the AHP analysis results were integrated into the COPRAS method, which requires the criterion weights to determine the normalized performance scores of the alternatives. While AHP is based on pairwise comparisons and consistency verification, COPRAS uses a linear additive benefit model. Although AHP and COPRAS differ in their conceptual foundations, the use of the weights obtained from the AHP analysis for COPRAS analysis is theoretically valid under certain conditions. To ensure methodological consistency, the sum of the AHP weights was normalized to be 1 and the ratio scale results were converted to appropriate proportional values

for additive models such as COPRAS (42,43). In addition, in order for COPRAS to remain on an interval scale in the study, the alternative scores used were independently collected through expert evaluations on a Likert scale in accordance with the weighted addition principle. Some studies in the literature indicate that integrating AHP-derived weights into different MCDM methods, including COPRAS, will yield robust and interpretable results, provided that normalization and scale consistency are managed appropriately (42-44). The methodological integration in this study was designed by the principles of AHP for reliable criterion weighting and COPRAS for ranking alternatives based on cost-benefit analysis.

Table 1. Working models

Working model code	Working models	Working model descriptions	References
DNM	Digital nomad model	Employees work from different parts of the world, constantly changing locations. Geographic flexibility is at the forefront of this model.	17,18
HW	Hybrid work	Employees work from the office on certain days of the week and remotely on certain days.	14,15
FW	Flexible work	Employees determine their working hours and are required to complete their work within a certain period of time.	21-23
SW	Shift work	Employees work in rotation at different time zones of the day. It is frequently applied in sectors that require 24/7 service, such as healthcare.	19,20
FRW	Full-time remote work	Employees conduct all of their work remotely, usually from their homes or other locations.	16
PPBW	Part-time-project based work	Employees work on a limited basis for specific projects or periods, unlike a full-time job.	24
FOW	Full-time office work	Employees work full-time in the company's physical office during certain working hours.	12,13

Table 2. Criteria affecting working models

Criteria code	Criteria	Criteria descriptions	References
CO	Cost	Low costs in insurance companies are critical for efficient use of resources and sustainable profitability. Low-cost business models increase the company's competitiveness and reduce financial risks.	34,35
EP	Employee productivity	Employee performance in insurance companies is of critical importance in terms of service quality and the effectiveness of operational processes. Working models that increase employee productivity contribute to faster responses to customer demands by optimizing business processes.	27,28
DS	Data security	Data breaches seriously damage the company's reputation and customer trust. Secure working models ensure that customer information is protected against cyber-attacks and data leaks.	32,33
CS	Customer satisfaction	It is an indicator of the quality of the services provided by insurance companies and the extent to which they meet customer expectations. Models with high customer satisfaction provide advantages in terms of customer loyalty and long-term success.	25,26
TCC	Team communication and collaboration	In companies that adopt a good communication model, the flow of information accelerates, errors are reduced and customer demands are met more efficiently. Working models that strengthen cooperation also enable more successful interventions in times of crisis.	36,37
WLB	Work-life balance	Working models that protect employees' work-life balance prevent burnout syndrome and increase employee loyalty in the long term.	29-31
BCCM	Business continuity and crisis management	Providing uninterrupted service, especially in health insurance services, during crises plays a critical role in preventing customer losses.	38,39

Table 3. Expert details

Experts	Area of expertise	Education level	Title	Experience (years)
E1	Health management	PhD.	Assoc. Prof.	14
E2	Occupational health and safety	Master	Expert	12
E3	Management and strategy	PhD.	Prof. Dr.	20
E4	Banking and insurance	PhD.	Prof. Dr.	17
E5	Business	PhD.	Prof. Dr.	22

Analytical Hierarchy Process

The AHP is a structured decision-making methodology widely used in various fields, including management, engineering, and education, to facilitate complex decision-making by breaking a problem into a hierarchy of subproblems that can be analyzed independently (45,46). AHP allows decision makers to systematically evaluate multiple criteria and alternatives, allowing them to prioritize options according to their relative importance (45). The AHP methodology includes the following steps (47);

Problem Definition and Hierarchical Structuring: The first stage involves clearly defining the decision problem and structuring it into a hierarchy. The decision problem is typically structured into a hierarchy with the main objective at the top, followed by the criteria and subcriteria, and finally the alternatives at the bottom.

Pairwise Comparisons: Decision makers make pairwise comparisons between criteria and alternatives. Each element is compared to all other elements in terms of its contribution to the goal. This is done using a relative importance scale (1 (equal importance) - 9 (extreme importance) that allows for the quantification of subjective judgments.

Calculating Weights and Consistency Ratio: The results of the pairwise comparisons are used to calculate the weights of each criterion and alternative. A consistency ratio (CR) is calculated to ensure that the decisions made are consistent. This can be done using various methods such as the eigenvector method or linear programming approaches.

Synthesizing the Results: Finally, the weighted scores of the alternatives are added to determine the overall ranking. This synthesis provides a clear indication of which alternative is preferred according to the established criteria.

Complex Proportional Assessment

COPRAS is one of the MCDM methods that provide a systematic and effective framework for evaluating alternatives and making informed choices in complex decision-making scenarios (48). One of its most basic features is that it gradually ranks alternatives according to their importance and benefit. It compares alternatives with each other and reveals how much better or worse they are than other alternatives as a percentage (49). The COPRAS method steps can be expressed as follows (49).

Creation of the decision matrix: The decision matrix is created from the x_{ij} values. The criteria are in the row section, and the alternatives are in the column section (Equality 1).

$$D = \begin{vmatrix} X_{11} & \dots & X_{1n} \\ . & . & . \\ X_{m1} & \dots & X_{mn} \end{vmatrix} \quad \text{(Equality 1)}$$

Creating the normalized decision matrix: The normalized decision matrix is determined using Equality (2).

$$x_{ij}^{*} = \frac{x_{ij}}{\sum_{i=1}^{m} x_{ij}}, \quad \forall j = 1,2,3,\dots,n \quad \text{(Equality 2)}$$

Creation of weighted decision matrix: Weighted normalized decision matrix is created with Equality (3). Here, d_{ij} is the weighted value, w_j is the criterion weight. Criterion weights are obtained by AHP method.

$$D' = d_{ij} = x_{ij}^{*} \cdot w_j \quad \text{(Equality 3)}$$

Calculation of the optimality function value (benefit-cost): High (max) desired criteria are expressed as "benefit"; low (min) desired criteria are expressed as "cost". The sum of the values in the weighted normalized decision matrix for benefit and cost criteria is calculated using Equality (4) and Equality (5), respectively.

$$S_i^{+} = \sum_{j=1}^{k} d_{ij}, \quad j = 1,2,3,\dots,k \text{ benefit criteria} \quad \text{(Equality 4)}$$

$$S_i^{-} = \sum_{j=k+1}^{n} d_{ij}, \quad j = k+1, k+2, k+3, \dots, n \text{ cost criteria} \quad \text{(Equality 5)}$$

Calculating the relative importance of alternatives: The relative importance value (Q_i) is calculated for alternatives with Equality (6). The highest Q_i value obtained represents the best alternative.

$$Q_i = \frac{S_i^{+}}{\sum_{i=1}^{m} S_i^{-}} \cdot S_i^{-} \cdot \sum_{i=1}^{m} \frac{1}{S_i^{-}} \quad \text{(Equality 6)}$$

Determining the highest relative importance: The one with the largest value among the relative priority values is calculated (Equality 7).

$$Q_{\max} = \max\{Q_i\}, \quad \forall i = 1,2,3,\dots,n \quad \text{(Equality 7)}$$

Determining the benefit levels of alternatives: The performance index (P_i) is calculated for each alternative using Equality (8).

$$P_i = \frac{Q_i}{Q_{\text{maks}}} \cdot 100\ (\backslash\%) \qquad \text{(Equality 8)}$$

Ethical Aspects of Research and Consent

The scientific applicability of the research was approved by the Non-Interventional Clinical Research Ethics Committee of a İstanbul Medipol University (decision no: 292, date: 06.03.2025). In addition, experts were informed about the study and signed an informed consent form.

Results

For the criteria affecting the study models, pairwise comparison matrices were obtained by collecting opinions from experts through AHP questionnaires. The integrated decision matrix was determined by taking the geometric averages of the values in the comparison matrices containing the opinions of all experts (Table 4).

The column totals of the values in the integrated decision matrix were taken, and each value was divided by the column total to create a normalized matrix. Then, the row averages of the normalized matrix values were taken to determine the eigenvector (weight) values of the criteria (Table 5).

To calculate the CR, the integrated decision matrix values were multiplied by the eigenvector values, the row sums were taken, and the eigenvalue scores were found. The average CR was found to be 0.071. Criteria weights and rankings are given in Table 6.

According to Table 6, the most important criterion to be used in the evaluation of the working models of health insurance companies was found to be cost with a normalized weight score of 23.04%. This was followed by CS (20.38%) and employee productivity (18.84%). Business continuity and crisis management was determined as the least important criterion with a weight of 7.50%.

According to the method, the benefit criterion indicates that higher values indicate a better situation in reaching the goal. The cost criterion represents that lower values indicate a better situation in reaching the goal. In this direction, the maximization of all criteria except cost in the study is a benefit. The high value of these criteria has a positive effect on the alternative selection. A survey form was prepared according to the 5-point Likert scale by considering the 7 criteria in Table 6 for the working models in Table 1. This survey form was evaluated by 5 experts whose details are shown in Table 3.

The decision matrix created by averaging the expert evaluations is shown in Table 7.

The normalized decision matrix was obtained using Equation (2) (Table 8).

Table 4. AHP integrated decision matrix

	CO	EP	DS	CS	TCC	WLB	BCCM
CO	1.00	1.00	5.20	1.00	3.12	2.00	2.00
EP	1.00	1.00	3.00	1.00	1.55	2.50	1.20
DS	0.20	0.33	1.00	0.50	2.50	1.00	3.00
CS	1.00	1.00	2.00	1.00	3.00	2.00	3.00
TCC	0.33	0.67	0.40	0.33	1.00	0.67	2.00
WLB	0.50	0.40	1.00	0.50	1.50	1.00	2.00
BCCM	0.50	0.83	0.33	0.33	0.50	0.50	1.00
Total	4.53	5.23	12.93	4.66	13.17	9.67	14.20

AHP: Analytical hierarchy process, CO: Cost, EP: Employee productivity, DS: Data security, CS: Customer satisfaction, TCC: Team communication and collaboration, WLB: Work-life balance, BCCM: Business continuity and crisis management

Table 5. AHP normalized matrix

	CO	EP	DS	CS	TCC	WLB	BCCM	Eigenvector (weight)
CO	0.22	0.19	0.40	0.21	0.24	0.21	0.14	0.2304
EP	0.22	0.19	0.23	0.21	0.12	0.26	0.08	0.1884
DS	0.04	0.06	0.08	0.11	0.19	0.10	0.21	0.1137
CS	0.22	0.19	0.15	0.21	0.23	0.21	0.21	0.2038
TCC	0.07	0.13	0.03	0.07	0.08	0.07	0.14	0.0841
WLB	0.11	0.08	0.08	0.11	0.11	0.10	0.14	0.1042
BCCM	0.11	0.16	0.03	0.07	0.04	0.05	0.07	0.0750

AHP: Analytical hierarchy process, CO: Cost, EP: Employee productivity, DS: Data security, CS: Customer satisfaction, TCC: Team communication and collaboration, WLB: Work-life balance, BCCM: Business continuity and crisis management

Table 6. AHP criteria weights and rankings

Criteria code	Criteria	Eigenvector (weight)	Ranking
CO	Cost	0.2304	1
CS	Customer satisfaction	0.2038	2
EP	Employee productivity	0.1884	3
DS	Data security	0.1137	4
WLB	Work-life balance	0.1042	5
TCC	Team communication and collaboration	0.0841	6
BCCM	Business continuity and crisis management	0.0750	7

AHP: Analytical hierarchy process

Table 7: COPRAS decision matrix

Working models	Criteria code						
	CO	EP	DS	CS	TCC	WLB	BCCM
DNM	4.8	2.8	2.4	4.8	3.0	3.8	4.0
HW	3.8	4.8	4.8	4.2	4.2	4.8	3.8
FW	2.2	3.8	2.8	3.0	3.6	2.8	3.2
SW	2.4	2.8	2.2	1.2	3.6	1.2	1.6
FRW	3.8	2.8	3.0	3.0	2.8	1.8	2.2
PPBW	3.8	4.8	3.8	3.2	4.0	2.2	2.2
FOW	3.8	4.2	2.8	2.8	2.8	3.8	3.2
Total	24.6	26	21.8	22.2	24	20.4	20.2

COPRAS: Complex proportional assessment, DNM: Digital nomad model, HW: Hybrid work, FW: Flexible work, SW: Shift work, FRW: Full-time remote work, PPBW: Part-time-project based work, FOW: Full-time office work, CO: Cost, EP: Employee productivity, DS: Data security, CS: Customer satisfaction, TCC: Team communication and collaboration, WLB: Work-life balance, BCCM: Business continuity and crisis management

Table 8. COPRAS normalized matrix

	Criteria						
	Min.	Max.	Max.	Max.	Max.	Max.	Max.
Weights	0.2304	0.1884	0.1137	0.2038	0.0841	0.1042	0.0750
Working models	**CO**	**EP**	**DS**	**CS**	**TCC**	**WLB**	**BCCM**
DNM	0.1951	0.1076	0.1100	0.2162	0.1250	0.1862	0.1980
HW	0.1544	0.1846	0.2201	0.1891	0.1750	0.2352	0.1881
FW	0.0894	0.1461	0.1284	0.1351	0.1500	0.1372	0.1584
SW	0.0975	0.1076	0.1009	0.0540	0.1500	0.0588	0.0792
FRW	0.1544	0.1076	0.1376	0.1351	0.1166	0.0882	0.1089
PPBW	0.1544	0.1846	0.1743	0.1441	0.1666	0.1078	0.1089
FOW	0.1544	0.1615	0.1284	0.1261	0.1166	0.1862	0.1584

COPRAS: Complex proportional assessment, DNM: Digital nomad model, HW: Hybrid work, FW: Flexible work, SW: Shift work, FRW: Full-time remote work, PPBW: Part-time-project based work, FOW: Full-time office work, CO: Cost, EP: Employee productivity, DS: Data security, CS: Customer satisfaction, TCC: Team communication and collaboration, WLB: Work-life balance, BCCM: Business continuity and crisis management

Equality (3) was applied using the criterion weights obtained as a result of the AHP analysis, and a weighted normalized matrix was created (Table 9).

The values of for benefit criteria and for cost criteria were determined using Equations (4) and (5). The relative importance values (Q_i) for each study model were calculated using Equation (6). In the next stage, the highest relative importance Q_{max} and the benefit degrees (P_i) of the study models were determined using Equations (7) and (8) and the final rankings were made (Table 10).

According to Table 10; hybrid work with a performance index of 100%, symbolized as is the most beneficial working model. Flexible work with a performance index of 87.47% and part-time-project-based work with a performance index of 80.95% are also among the most common models. The least beneficial working model was determined as SW with a performance index value of 62.43%.

Table 9. COPRAS weighted normalized matrix

Working models	Criteria no						
	CO	EP	DS	CS	TCC	WLB	BCCM
DNM	0.0449	0.0202	0.0125	0.0440	0.0105	0.0194	0.0148
HW	0.0356	0.0347	0.0250	0.0385	0.0147	0.0245	0.0141
FW	0.0206	0.0275	0.0146	0.0275	0.0126	0.0143	0.0118
SW	0.0224	0.0202	0.0114	0.0110	0.0126	0.0061	0.0059
FRW	0.0356	0.0202	0.0156	0.0275	0.0098	0.0091	0.0081
PPBW	0.0356	0.0347	0.0198	0.0293	0.0140	0.0112	0.0081
FOW	0.0356	0.0304	0.0146	0.0257	0.0098	0.0194	0.0118

COPRAS: Complex proportional assessment, DNM: Digital nomad model, HW: Hybrid work, FW: Flexible work, SW: Shift work, FRW: Full-time remote work, PPBW: Part-time-project based work, FOW: Full-time office work, CO: Cost, EP: Employee productivity, DS: Data security, CS: Customer satisfaction, TCC: Team communication and collaboration, WLB: Work-life balance, BCCM: Business continuity and crisis management

Table 10. Importance values and final ranking for working models

Working Models	S_i^+	S_i^-	Q_i	P_i	Ranking
DNM	0.1216	0.0449	0.1442	80.019	4
HW	0.1517	0.0356	0.1802	100	1
FW	0.1085	0.0206	0.1576	87.47	2
SW	0.0674	0.0224	0.1125	62.43	7
FRW	0.0906	0.0356	0.1191	66.10	6
PPBW	0.1174	0.0356	0.1458	80.95	3
FOW	0.1118	0.0356	0.1403	77.86	5

DNM: Digital nomad model, HW: Hybrid work, FW: Flexible work, SW: Shift work, FRW: Full-time remote work, PPBW: Part-time-project based work, FOW: Full-time office work

Discussion

Within the scope of the study, the most beneficial working models for health insurance companies were determined as hybrid working, flexible working and, part-time-project-based working, respectively.

When the hybrid working model with the highest performance index (100%) is examined, there are studies in the literature that support this opinion. Khatatbeh et al. (50) emphasized in their study that the hybrid working model would reduce burnout and increase job satisfaction by encouraging a better balance between personal and professional lives. Similarly, Siddika (51) stated in his study that the implementation of the hybrid working model during the COVID-19 outbreak enabled employees to re-evaluate their work-life balance and achieve better health outcomes and productivity as a result of the commute-related stress reduction. Buick et al. (52) stated in their study that with the transition to hybrid structures, resource use would be optimized, and companies could reduce costs associated with physical office spaces by offering more flexible working options. Indeed, Kajwang (53) pointed out that as job seekers increasingly prioritized work-life balance and health benefits in their employment decisions, the flexibility provided by hybrid models would lead to higher employee retention and lower recruitment costs for health insurers.

The working model with the second-highest performance index (87.47%) is flexible working. Menezes and Kelliher (54) emphasized that flexible working not only increased job satisfaction but also contributed positively to individual performance by meeting employees' needs for autonomy and work-life integration. Timms et al. (55) also emphasized the positive relationship between flexible working and the reduction of chronic stress, stating that flexible working was an important step in promoting a healthier and more productive workforce. Similarly, Ghali-Zinoubi et al. (56) emphasized that flexible working hours contributed to the reduction of work-life conflict and significantly increased employee satisfaction by allowing individuals to better manage their professional and personal lives.

The third highest performance index (80.95%) was found to be part-time project-based work. When looking at the studies in the literature, Zeng et al. (57) argued that project-based companies optimized resource management and increased their ability to respond quickly to market changes by aligning their workforce with project demands. They also stated that this situation provided a significant competitive advantage in the sector. Similarly, Aziz et al. (58) revealed the prevalence of adopting part-time project work models, especially during periods of uncertainty such as economic recession or epidemics, and stated that the flexibility offered by project-based employment structures allowed organizations to maintain operational continuity even in turbulent times and to adapt more easily to the potential risks of

subsequent crises. Similarly, Suryanto et al. (59) and Kimani and Kungu (60) argued in their studies that the dynamic nature of competition in the market required insurers to adopt innovative business development strategies that were effectively executed through project-based methodologies.

The findings of this study are open to evaluation with different theoretical frameworks. The trend towards hybrid and flexible working models in health insurance companies shows that companies adapt their structures and processes in response to environmental and technological changes. This situation overlaps with the organizational change theory (3). The determination of cost and CS as the most prioritized evaluation criteria intersects with the need for organizations to balance operational efficiency with service quality to maintain their competitive advantage in strategic management theory (5). On the other hand, the emphasis on data security and technological infrastructure, which constitute the basic dynamics of modern working models, can be associated with the implications of the digital transformation theory (7,8). Integrating these theoretical perspectives not only provides a deeper understanding of the empirical results but also enhances the practical implications of the study for strategic decision-making in health insurance companies.

Study Limitations

This study has several limitations that should be acknowledged. The criteria affecting the study models were obtained through a literature review. These criteria can be created based on qualitative data collection methods, such as in-depth interviews with experts and focus group discussions. The inclusion of additional or alternative criteria could influence the outcomes. Moreover, the evaluations were conducted in a cross-sectional manner, meaning that they did not account for dynamic changes in organizational needs, workforce preferences, or technological developments over time. Secondly, for the AHP and COPRAS methods, five experts from specific fields were consulted. Although these individuals were selected for their expertise, representativeness could be increased by adding opinions from participants from different fields.

Conclusion

Working models with different advantages and disadvantages can be applied in business processes for health insurance companies. It has been determined within the scope of the study that the most beneficial working model is hybrid working. The implementation of both remote and face-to-face working options can provide the opportunity to tap into a broader talent pool, including individuals who may face geographical or transportation restrictions and potential employees for health insurance companies. This model also allows employees to save time and transportation costs, increases work-life balance, and contributes to employee satisfaction. For days when working remotely, distractions in the office environment can be removed, and a more focused working order can be created. Expenses such as energy, transportation, and office supplies decrease. This situation also contributes to the sustainability goals of companies by reducing carbon emissions from transportation. It allows business continuity to be ensured, and a rapid transition to remote working can be made in crisis and extraordinary situations (pandemic, natural disasters, etc.). The applicability of this model also brings with it a strong technological infrastructure that supports remote working. The use of tools such as cloud-based systems, virtual private network solutions, video conferencing tools, and project management software should be integrated into the process. In addition, as in every representative of the health sector, the protection of personal data is a matter of particular importance in health insurance companies. In this regard, cybersecurity measures must be increased more than ever. In order to provide a more productive environment on days when working in the office, work areas should be optimized, and rearrangements such as open office areas or quiet study rooms should be made. In addition, it is recommended that managers be trained on remote team management and communication skills in terms of measuring and monitoring staff performance.

On the other hand, the flexible working model allows employees to work during the periods when they are most productive. For this reason, an evaluation system that focuses on work output rather than working hours should be established. In this model, trust in the time management and self-discipline skills of employees is essential. In this direction, employees should be given training to increase their skills in time management and motivation. Automatic call forwarding systems and digital assistants should definitely be put into operation so that flexible remote employees can respond quickly to customer demands. Working conditions from home should be improved by providing digital office support.

Finally, part-time project-based employees are more cost-effective than full-time employees. This model offers a cost-efficient solution for insurance companies operating under limited project budgets. The quality and efficiency of project outputs also increase as it ensures that employees with a specific area of expertise are included in the project. It also provides scalability of workload for insurance companies. When project intensity increases, more employees can be hired, and when it decreases, the number of employees can be reduced. Indeed, when the project is completed, the employment relationship of the employees ends, which reduces long-term costs. For this model, employees' data security policies can be clearly defined, and an authorized access model can be created. It should be clearly stated which tasks employees should complete and when, and job analyses should be performed. Online project management platforms should be used for effective management of teams, and project-based progress payment systems should be put into effect.

In this context, it is important for health insurance companies to first analyze their business processes and determine which model is more suitable for which department or task. By blending these models with a strategic approach, companies can both increase employee satisfaction and ensure operational efficiency. In this way, it will be easier for them to achieve long-term growth and sustainability goals. While the results offer valuable insights into

working model prioritization, the applicability of the findings may vary in other countries depending on regulatory, cultural, and economic factors. Future studies can expand this research by comparing health insurance companies across different national contexts.

Ethics

Ethics Committee Approval: The scientific applicability of the research was approved by the Non-Interventional Clinical Research Ethics Committee of a İstanbul Medipol University (decision no: 292, date: 06.03.2025).

Informed Consent: Experts were informed about the study and signed an informed consent form.

Footnotes

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