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ODESA NATIONAL UNIVERSITY OF TECHNOLOGY

International Competition of
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BLACK SEA SCIENCE 2026

PROCEEDINGS



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Odesa National University of Technology

International Competition of Student Scientific Works

BLACK SEA SCIENCE 2026

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6. TOURISM, HOTEL AND RESTAURANT BUSINESS

**NEUROBEHAVIORAL TECHNOLOGIES IN THE HOSPITALITY
AND TOURISM INDUSTRY: FROM CLASSICAL APPROACHES
TO TRAUMA-SENSITIVE SERVICE**

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Abstract. *This study investigates the application of neurobehavioral technologies in the service sector of the hospitality and tourism industry, aiming to analyze the subconscious influence of the sensory environment on guest behavior. Special attention is given to a trauma-informed approach for clients with war experience and internally displaced persons. The research is based on in-depth interviews, observations, staff surveys, and consultations with psychologists working with veterans and internally displaced individuals. Key sensory and symbolic «triggers» that provoke negative emotions, as well as «glimmers» – positive stimuli that foster a sense of safety and trust – have been identified. The study demonstrates that classical standardized service approaches are not always effective under conditions of heightened guest anxiety and may lead to retraumatization. An integration of knowledge from neuroscience, trauma psychology, and sensory marketing is proposed to enhance psychological comfort, customer loyalty, and the economic efficiency of establishments through adaptive KPIs. The scientific novelty of the work lies in a systematic approach to creating a safe sensory environment and implementing the concepts of «triggers» and «glimmers» into service practice.*

Keywords: *Neurobehavioral technologies, service, hospitality and restaurant business, tourism, trauma-informed service, triggers, glimmers, psychological safety, customer experience.*

I. INTRODUCTION

The contemporary hospitality and tourism industry faces a paradox: under identical service conditions, different guests exhibit fundamentally distinct behavioral responses. Traditional approaches, which explain customer choice solely through rational reasoning, prove limited, particularly in the context of population psychological vulnerability and wartime challenges. The concept of Neuro Hospitality integrates neurobehavioral technologies, sensory marketing, and cognitive psychology to analyze and predict guest responses. Trauma-informed service is especially relevant, as it minimizes stress triggers, adapts service to customers' subconscious reactions, and fosters psychological safety. The study demonstrates that the use of sensory and behavioral tools, such as «triggers» and «glimmers», enhances comfort, trust, and the likelihood of repeat visits, while simultaneously impacting the economic performance of hospitality establishments.

II. LITERATURE ANALYSIS

Research on sensory influence, neuromarketing, and trauma-informed service has attracted scholarly attention, as these aspects shape the consumer experience in the hotel, restaurant, and tourism industry. International studies show that most purchasing decisions are subconscious, and traditional surveys often fail to capture actual

consumer motives. M. Lindstrom demonstrated that brands influence the brain through emotions and sensory associations rather than logic, forming the basis for the Neuro Hospitality concept and the shift toward trauma-informed service [8].

C. Spence systematized experiments on the effects of sound, color, lighting, and the weight of cutlery on taste perception, demonstrating a scientifically grounded system of multisensory experience [14]. D. Bridger found that the brain processes visual images 60,000 times faster than text and proposed the principle of Visual Silence to reduce cognitive load in menu design and interior [1]. H. Liu introduced the Trauma-Informed Customer Experience Design (TICXD), emphasizing the critical importance of considering psychological trauma in service design [8;9].

In Ukraine, this topic has been studied less systematically but with practical value: S. O. Koval analyzed neuromarketing tools for restoring tourist trust during wartime [6], while I. Ya. Kulin'iak et al. showed that sensory technologies significantly influence tourists' comfort and behavior [7]. Gorbali and Revutska demonstrated the role of emotional marketing, and T. Momotkova justified the application of neurotechnologies in building user experience in hospitality and tourism [4;11].

Thus, international studies provide fundamental knowledge on subconscious reactions and multisensory environments, while Ukrainian research adds analysis of market specifics and service adaptation to guests' emotional states. Together, these findings form the foundation for the development of neuro-oriented and trauma-informed service concepts.

III. OBJECT, SUBJECT, AND METHODS OF RESEARCH

Despite significant contributions of international and Ukrainian studies on sensory influence, neuromarketing, and trauma-informed service, the adaptation of hospitality practices to guests' psychological vulnerability remains underexplored.

Research aim: to identify effective neurobehavioral technologies to enhance psychological comfort, emotional safety, and trust among hospitality and tourism guests, particularly those with war-related trauma or internal displacement experiences.

Objectives:

- identify sensory and psychological factors affecting guest behavior;
- review contemporary methods of neurobehavioral consumer analysis in hospitality;
- systematize sensory triggers and positive glimmers in service;
- evaluate the effectiveness of adaptive trauma-informed approaches;
- develop practical tools for staff and behavioral KPIs to assess comfort, safety, and trust.

Research object: guest behavior in hotels, restaurants, and tourism facilities under conditions of heightened psychological vulnerability.

Research subject: sensory and behavioral factors shaping emotional comfort, psychological safety, and positive experience of guests with war-related trauma.

Research methods: a mixed-methods approach was employed, combining quantitative and qualitative data. Previous international and Ukrainian studies on Neuro Hospitality, multisensory perception, and trauma-informed service were analyzed to identify key sensory and behavioral factors.

The study included:

- observation (assessing guest responses in «noisy» and «quiet» zones);
- in-depth interviews (with military psychologists and veterans to identify stress triggers and effective glimmers);
- staff surveys (evaluating knowledge and readiness for trauma-informed service).

This approach integrates guest subconscious reactions, sensory patterns, and staff preparedness, providing evidence-based recommendations for hospitality and tourism practice.

IV. RESULTS

4.1. Neuro-behavioral technologies as a tool for influencing consumer behavior in hospitality and tourism

Neuro-behavioral technologies in service comprise methods that leverage knowledge of neurophysiological, psychological, and behavioral responses to predict and shape consumer behavior. They target subconscious mechanisms of perception, emotional evaluation, and decision-making, which largely determine the choice of tourism and hospitality services.

4.1.1. Sensory Marketing and Embodied Cognition in Service Environments

Within the Neuro Hospitality framework, sensory marketing functions as a targeted tool to influence guests' perception of the service environment. Visual, auditory, tactile, gustatory, and olfactory stimuli shape first impressions, emotional evaluation of the space, and trust in the establishment, largely determining consumer behavior [14].

The relevance of sensory marketing lies in the fact that most hospitality decisions are made subconsciously. Staff act as carriers of sensory signals, directly affecting guests' emotional state and their sense of comfort and safety.

Sensory marketing (multisensory marketing) is based on the concept of embodied cognition, which posits that perception, thinking, and decision-making are closely linked to bodily experiences and sensory sensations [14].

Key sensory channels include:

- olfactory influence (smell). Scents directly stimulate the limbic system, evoking emotions and associations. For instance, McDonald's uses a Signature Scent that fosters feelings of stability and safety, reduces anxiety, and subconsciously encourages purchasing decisions [14].
- auditory environment. Background music affects guests' emotional state, eating pace, and table turnover.
- lighting design. Lighting regulates circadian rhythms, promoting relaxation or activity. Dark dining formats enhance taste and tactile experiences, reduce social anxiety, and increase trust in staff.

Thus, sensory marketing within embodied cognition enables the creation of a coherent service environment, enhances guests' psychological safety, and fosters a sustainable positive customer experience in the hospitality and restaurant sector.

4.1.2. Methods for Studying Guests' Subconscious Reactions

Applied neuromarketing tools are used to study guests' subconscious reactions directly in hotels, restaurants, and tourism settings:

- *Eye-tracking* – monitors where guests look, helping optimize menus, spatial navigation, and digital interfaces. This method increases average check, simplifies orientation, and reduces guests' cognitive load.
- *Facial Coding* – analyzes microexpressions to detect hidden emotions, assess staff performance, and enhance training programs.

These tools enable managers to make evidence-based decisions, increase guests' psychological comfort and trust, and adapt services to client needs.

4.2. Trauma-Informed Service in Modern Hospitality and Tourism

Prolonged conflict and socio-economic challenges have significantly affected guests' psychophysiological state, with many experiencing chronic stress and heightened anxiety. Traditional service approaches focused on intensive stimulation and active selling often lose effectiveness and may trigger retraumatization [1;9].

The solution is Trauma-Informed Customer Experience Design (TICXD), integrating trauma psychology and neuroscience [9;10], aiming to:

- ensure psychological safety and guest control;
- reduce stress reactions;
- increase trust and loyalty [1].

Practical implementation includes:

- managing potentially traumatic environmental factors (sound, lighting, odors);
- designing service scenarios that foster safety and comfort;
- training staff to respond to guests' emotional needs without pressure.

Trauma-informed service thus becomes not merely a social option but a neuro-behavioral tool that enhances client experience and loyalty in hospitality and tourism.

4.2.1. Sensory Triggers and Glimmers: Negative and Positive Service Stimuli

In trauma-informed service, it is essential to distinguish stress-inducing stimuli from those that promote a sense of safety.

Triggers – sensory, symbolic, or communicative cues that elicit negative emotions or flashbacks [12]:

- auditory (loud noises, clattering dishes, sirens);
- visual (flashing lights, militarized decor);
- symbolic (names of dishes or drinks associated with conflict);
- spatial (seating with back to doors, lack of visual control over entrances).

Glimmers – positive micro-moments signaling safety and calm [16; 17;18]:

- sensory (warm lighting, soft music, comfortable furniture);
- communicative (empathetic tone, predictable staff actions);
- spatial (private zones, clear wayfinding to exits).

Recognizing triggers and glimmers helps adapt the environment to ensure guests' comfort and psychological safety.

4.2.2. Transformation of Service Approaches: from «Old» to «New»

Based on the principles of triggers and glimmers, modern establishments are transforming traditional service approaches to ensure guest comfort and safety. Neuromarketing research shows that old methods, long considered the «gold standard,» may lose effectiveness under current conditions and even negatively affect guest experience and business outcomes [3;5].

Old (traditional) – relies on standardized scripts, active upselling, and uniform phrases («Try our new dish», «May I recommend?»). Historically effective in predictable environments, but under heightened psychological stress, such communication is often perceived as pressure or indifference, reducing guest satisfaction [3;5].

New (adaptive, empathetic) – emphasizes empathetic observation and behavioral adaptability. Staff learn to read nonverbal signals such as facial expressions, posture, speech tempo, and personal space, adjusting communication style accordingly. Key elements include tone of voice, pace of information delivery, and spatial positioning.

Restoring a sense of control for guests – through choices like seating, lighting, and service pace – combined with predictable staff behavior and minimization of unexpected stimuli, is central to trauma-informed service [9;10;18].

Modern establishments apply these principles to adapt service elements and the sensory environment, enhancing comfort and safety. Table 1 presents examples of how specific service elements can shift from «Old» approaches to neuro-behavioral solutions, considering contemporary sensory and emotional risks.

Table 1. Transformation of Service Elements: from Traditional to Neuro-Behavioral Approaches

Service Element	Old Approach (Outdated)	Current Risks	New Neuro-Behavioral Approach
Aromas [13]	Strong artificial scents (coffee, pastries) at entrance	May cause nausea or danger associations in hypersensitive guests	Scent zoning: subtle natural scents (wood, citrus), ventilation options
Color [2]	Red and yellow to stimulate appetite	Subconsciously associated with danger, blood, anxiety	Pastel and natural tones: green, blue, beige to reduce cortisol
Music	Loud, dynamic music for fast table turnover	Causes sensory overload and desire to leave	Adaptive sound design: individual audio zones, nature sounds, volume control
Scripts	Rigid sales scripts, active upselling	Perceived as pressure or aggression, reduces trust	Empathetic communication: flexible, attentive to nonverbal signals, respect personal boundaries

In conclusion, transforming service approaches from «Old» to «New» and adapting the sensory environment not only prevents negative guest reactions but actively fosters a sense of safety and comfort. This highlights the critical role of neuro-behavioral solutions in trauma-informed service.

4.3. Study of Sensory Triggers and Their Impact on Guest Behavior and Economic Potential of Establishments

The implementation of neuro-behavioral technologies in hotels, restaurants, and the tourism sector has potential economic benefits. The research hypothesis is: «Enhancing emotional comfort by neutralizing sensory triggers positively affects guest behavior and potentially the financial performance of the establishment».

To assess the effect on guest behavior and loyalty, the following were used:

- 1) *Average Check* – potential increase due to longer guest dwell time and additional menu orders.
- 2) *LTV (Lifetime Value)* – loyalty of guests with war-related experiences to establishments where they feel understood and safe.
- 3) *NPS (Net Promoter Score)* – willingness to recommend the establishment as a «safe place».

4.3.1. Key Sensory Triggers of Discomfort

A study of sensory factors causing discomfort was conducted in hotels, restaurants, and tourism establishments in Ukraine (Kropyvnytskyi, Mykolaiv, and Odesa). The impact of auditory, visual, and spatial factors on guests' emotional comfort and psychological safety was analyzed.

The results showed that hotel guests expect quietness, sensory calm, and spatial predictability. The highest levels of discomfort were caused by loud noises (32%) and bright or cold lighting (25%) (Fig.1). In restaurants, the primary trigger of discomfort was auditory. Loud music and background noise directly affected guests' appetite and their length of stay (Fig.2).

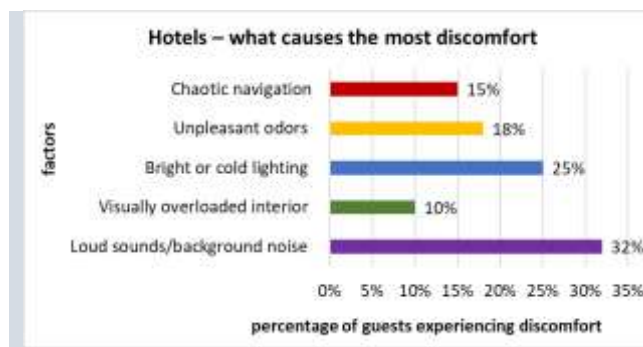


Fig.1. Sensory Factors of Discomfort in Hotels

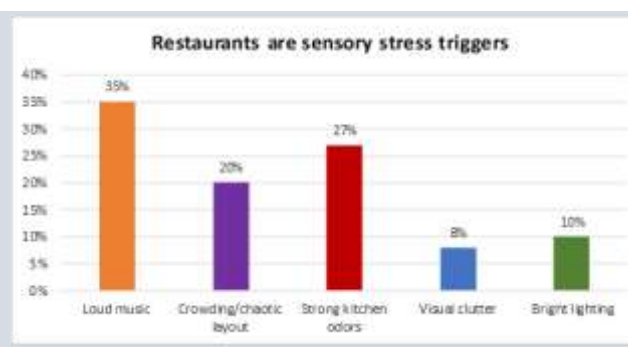


Fig.2. Sensory Factors of Discomfort in Restaurants

For agritourism estates, space, openness, and clear navigation are the most important factors. Unpleasant odors and chaotic spatial organization generate the highest discomfort, while loud music is not critical (Fig.3). Across all three sectors, the highest discomfort levels are associated with overloads in auditory, visual, and olfactory channels. The analysis showed that most employees in the hotel and restaurant sector lack the necessary skills to provide psychologically safe service (Fig.4).

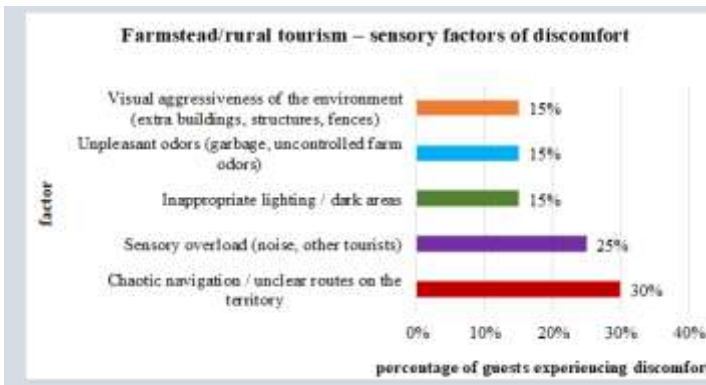


Fig.3. Sensory discomfort factors in the tourist environment (rural agritourism estates)



Fig.4. Staff skills in providing psychologically safe service

Only about half of guests rate staff communication as friendly, indicating a need for training and implementation of emotional safety standards (Fig.5). The chart shows that only a third of guests experience a high level of emotional comfort. Guests with heightened psychological sensitivity require additional attention from the service (Fig.6).

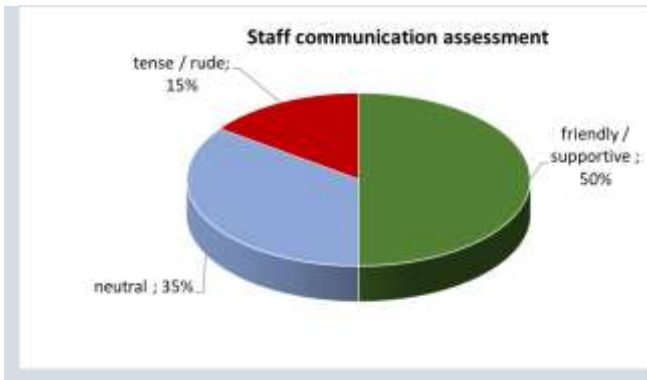


Fig.5. Assessment of staff communication level



Fig.6. Assessment of guests' emotional comfort level

The infographic summarizes the key service problem areas that require improvement and formed the basis for further original developments (Fig.7).

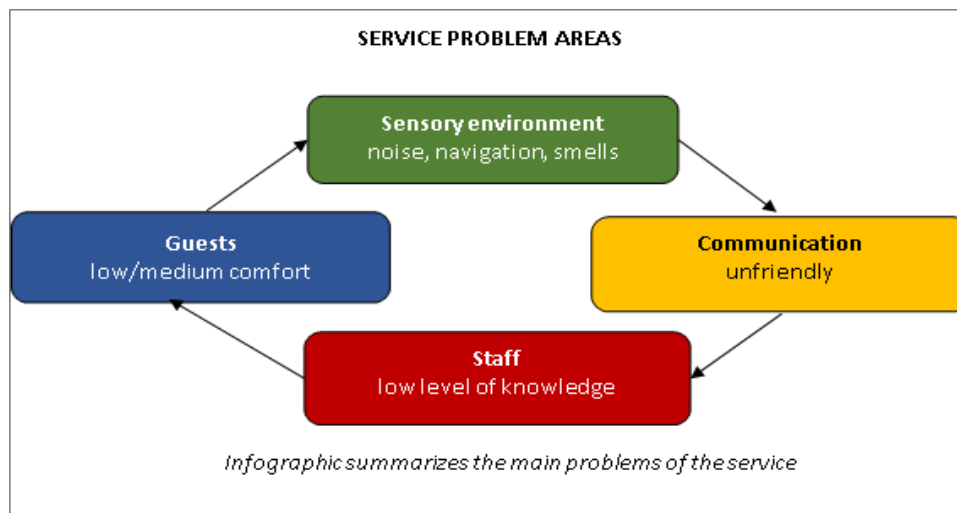


Fig.7. Key service problem areas in the hospitality and tourism industry

4.3.2. Sensory and Associative Triggers in the Context of War

Within this study, in addition to observations and surveys of guests and staff, consultations were conducted with psychologists who work with military personnel and individuals who have experienced traumatic events. This allowed the identification of specific sensory and associative triggers that directly affected the psychological comfort of these guests.

Scents. Guests reported that sweet or vanilla scents, which are usually perceived as pleasant in service environments, caused discomfort and were associated with trauma or fatalities experienced during combat. In addition, the smell of burning materials, which they had encountered during the Kherson occupation in summer 2022, produced a strong negative effect, even when in restaurants or hotels it was associated with cooking or frying food.

Sensory characteristics of materials. During clay modeling workshops, former military personnel noted that the texture and color of certain types of soft clay resembled blood-soaked soil they had seen during combat. This triggered anxious reactions, as confirmed by psychologists' observations.

Visual symbolism. Letters such as Z and V, which appeared on Russian military equipment during the occupation, are now present in decorative elements of establishments (embroidery on tablecloths, napkins, dishes, interior elements) or in logos and staff uniforms. For internally displaced persons who experienced the occupation, these symbols act as triggers, causing discomfort and activating memories of traumatic events.

Musical accompaniment. Guests reported that Russian-language music triggered anxious reactions, while Ukrainian songs with emotionally heavy lyrics – for example, the indie band «Odin v Kanoie» song «*U mene nema domu*» – also served as strong triggers for those who lost their homes or experienced the occupation. Psychologists confirmed that the content of the song lyrics significantly amplified stress reactions. Additionally, other melancholic songs about losing one's home or loved ones also activated traumatic memories.

Water sounds. Fountains, pools, aquariums, or decorative streams, which normally have a calming effect, caused anxiety for military personnel and internally displaced guests, as they were associated with dangerous water situations during combat (crossings, boat accidents).

4.3.3. Research Summary

The results emphasize the necessity of a systematic approach to organizing both service and sensory environments. Traditional methods proved limited for guests with traumatic experiences, highlighting the need to implement neurobehavioral technologies to identify and minimize sensory triggers.

Observations showed that the removal of triggers positively affected guest behavior: guests stayed longer in the venue, ordered more items from the menu, and were more likely to recommend the establishment. These effects were reflected in Average Check, LTV, and NPS.

4.4. Practical Tools for Trauma-Informed Service

This study proposes a neuro-service management model, demonstrating a systematic approach to designing service environments that account for guests’ sensory, emotional, and behavioral reactions. The model shows how different elements interact to create comfort, safety, and loyalty (Fig.8).

Sensory environment (blue): lighting, sound, scents, interior, textures, microclimate – provides basic comfort and reduces anxiety.

Emotional interaction (green): staff communication, service style, process pace – crucial for psychologically sensitive guests, veterans, and IDPs.

Personalization (orange): adapting service to the guest, considering preferences and behavioral responses, reducing trigger risks.

Monitoring & adaptation (purple): evaluating service effectiveness, identifying triggers, adjusting processes, continuous improvement.

Managerial integration (red): implementing monitoring results into standards, policies, staff training, KPIs, and innovations.

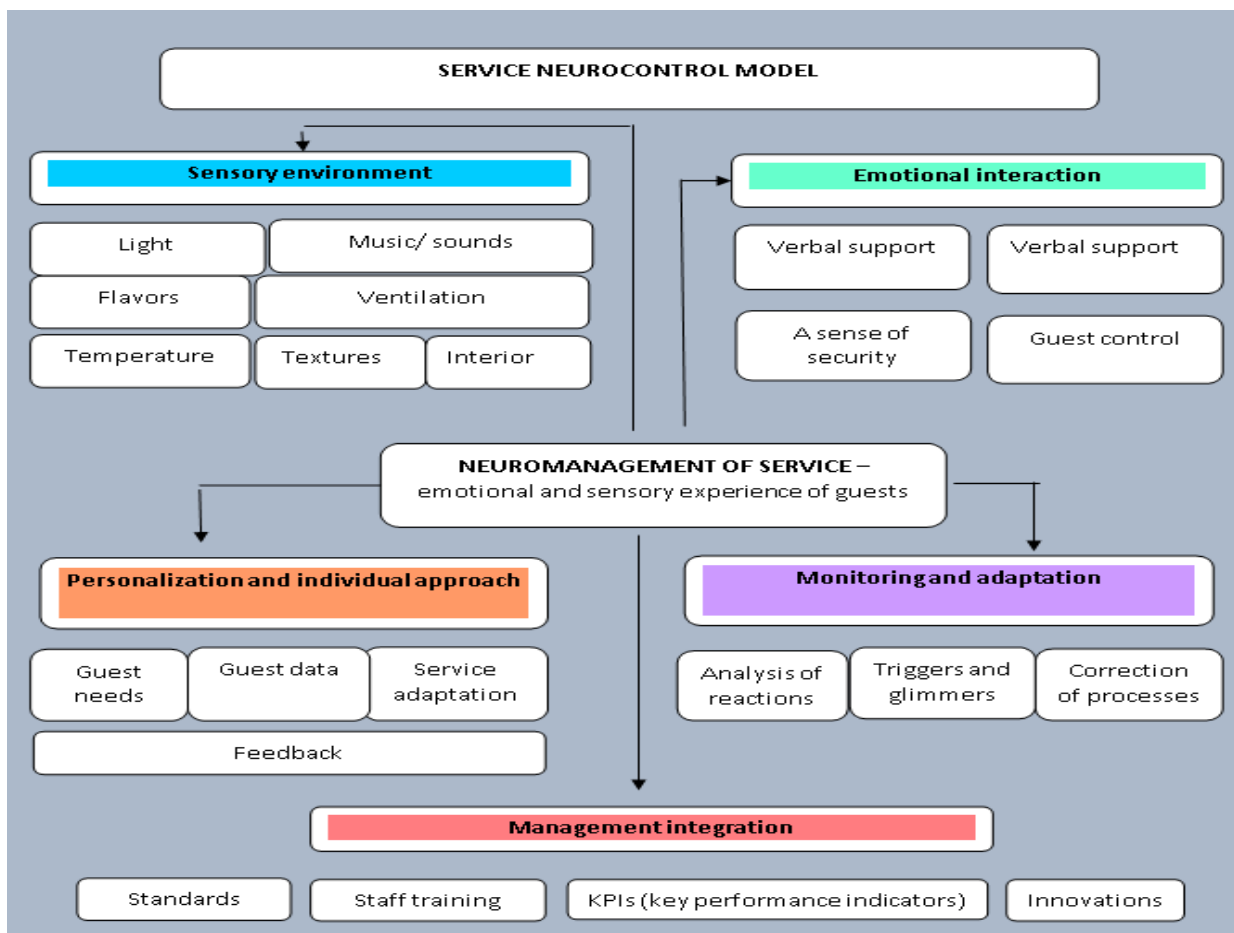


Fig.8. Neuro-Service Management Model

The service flow: sensory environment – comfort, emotional interaction – safety, personalization – adaptation, monitoring – response, managerial integration – coordination. This cycle enhances service and increases guest loyalty.

The model serves as a practical tool for hotel management and a theoretical basis for further research in neuro-oriented service.

In hospitality, classic service management, neuro-management, and neuromarketing are often treated separately. Practice requires an integrated approach that combines operational efficiency with emotional and sensory guest experience.

In the modern hospitality industry, traditional service management, neuro-management, and neuromarketing are often considered separately, without clearly reflecting their interaction or hierarchy. Meanwhile, hotel, restaurant, and tourism operations require an integrated approach that combines operational efficiency with guests' emotional and sensory experiences.

This study proposes an original framework – «*Service, Neuro-Management, and Neuromarketing*» – which demonstrates the unity and complementarity of the three approaches and their impact on guest comfort, loyalty, and satisfaction (Fig.9).

Service in hospitality: encompasses all service processes and determines customer satisfaction and the competitiveness of the enterprise.

Traditional service management: planning, organization, control, and standardization; focuses on operational efficiency and adherence to standards, with limited consideration of emotional and neuropsychological factors.

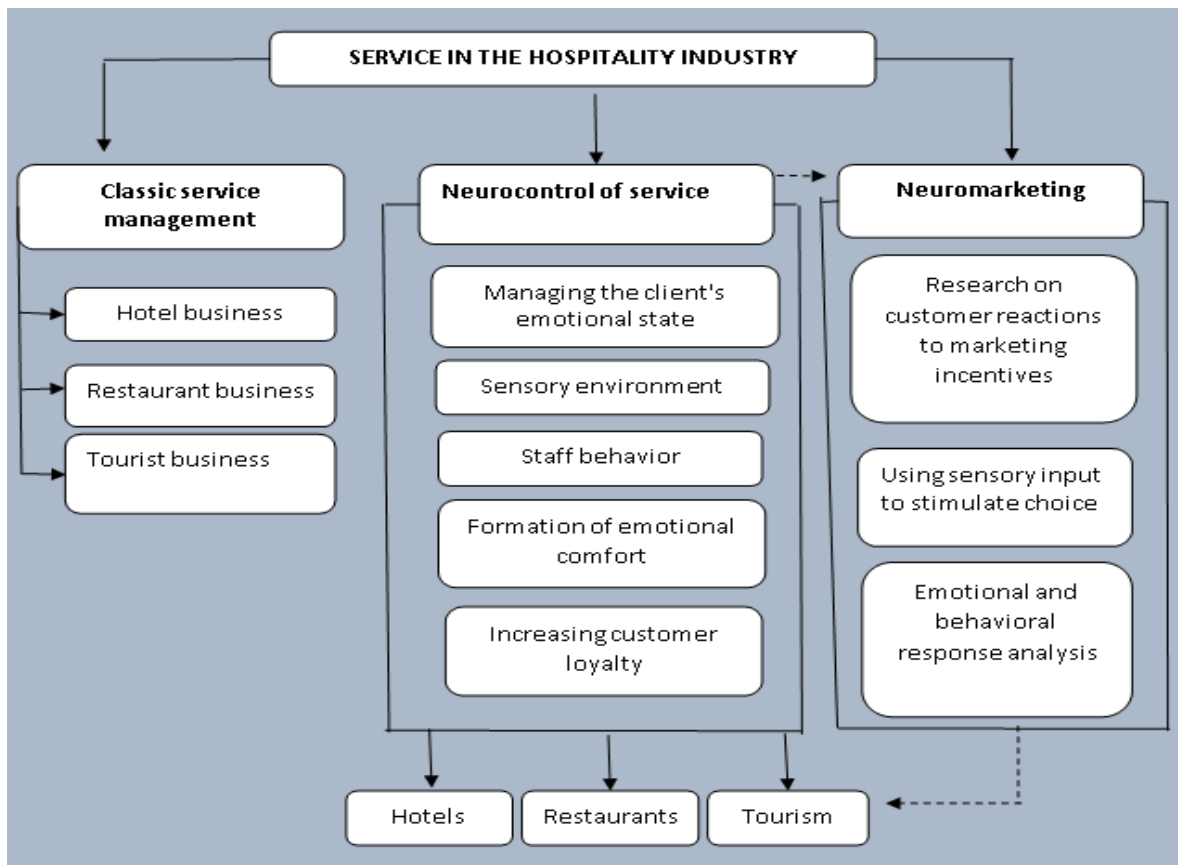


Fig.9. Service, Neuro-Management, and Neuromarketing in Hospitality

Neuro-management: complements the traditional approach with knowledge of guests' emotions, sensory perception, and behavioral reactions; involves managing emotional states, sensory environment, staff behavior, and creating emotional comfort.

Neuromarketing: studies client responses to marketing stimuli, shapes an appealing brand image, and influences service choice; closely linked to neuro-management through emotional and behavioral reactions.

The framework illustrates that neuro-management acts as a bridge between operational management and marketing influence, ensuring emotional comfort, loyalty, and positive guest experience. It highlights the integration and interaction of the three approaches across hospitality segments, serving as both a practical management tool and a foundation for further research.

In addition to theoretical models, creating practical tools for managers and staff is crucial. This study developed a «*Behavioral Risk Map*», which helps identify and minimize stress triggers in different areas of a venue.

This tool is especially relevant for guests with heightened psychological sensitivity – veterans, internally displaced persons (IDPs), and clients experiencing emotional exhaustion. Even minor sensory or communicative stimuli can provoke stress and affect the overall guest experience.

The *Behavioral Risk Map* enables a systematic assessment of potential triggers across service aspects and provides recommendations for their mitigation (Table 2).

Table 2. Behavioral Risk Map

Zone / Aspect	Description	High Risk	Medium Risk	Low Risk	Comments / Recommendations
Entrance Area	First impressions, space, orientation	Loud noise, chaotic navigation, large crowds	Moderate queue, unclear signage	Clear navigation, calm lighting, staff greeting	Install informational stands; organize “meet and escort” service
Music / Sound	Volume, rhythm, style	Loud, aggressive, chaotic	Medium volume, uncertain style	Soft, calm, relaxing	Use playlists for relaxation or neutral melodies
Interior	Color, shape, furniture, spatial layout	Sharp corners, bright contrasting colors, cramped space	Moderately bright style, limited “cozy corners”	Soft colors, natural materials, space for personal comfort	Add soft seating areas, plants, natural lighting
Staff Communication	Manner of speaking, voice, gestures	Tense, rude, rushed, commanding	Standard, formal	Friendly, calm, polite	Provide trauma-informed service training, active listening techniques
Menu / Food	Offerings, presentation, taste, smell	Strong odors, spicy food without warning	Partially unusual flavor combinations	Balanced menu, familiar taste elements	Include ingredient information, options for choice, light dishes
Symbols / Decor	National symbols, religious elements, ornaments	Inappropriate or provocative signs	Partially patriotic, not universally understood	Ukrainian symbols, neutral motifs, calming ornaments	Use symbols that convey safety and community without excessive political controversy

Usage guidance: High-risk items require immediate correction (lighting, music, spatial organization), medium-risk items require monitoring and adjustment if needed, and low-risk items are maintained as standard. Guest subtypes can also be introduced to enhance personalization and the effectiveness of interventions.

Based on the *Behavioral Risk Map*, a proprietary *Minimum Standard for Staff* was developed, structuring training and the implementation of emotional safety principles into the daily operations of the establishment.

The standard includes key principles of emotional safety and concrete practical steps for workplace application. It is presented as a staff handbook, allowing systematic training: each employee studies the standard, completes training, and takes a short test to confirm understanding.

Benefits of implementing the standard:

- 1) Establishing a unified culture of emotional safety within the venue;
- 2) Increasing guest comfort and satisfaction;
- 3) Reducing the risk of conflicts and stressful situations for both staff and clients;
- 4) Practical application of principles in daily operations.

The main principles of the standard are illustrated in the diagram (Fig.10).

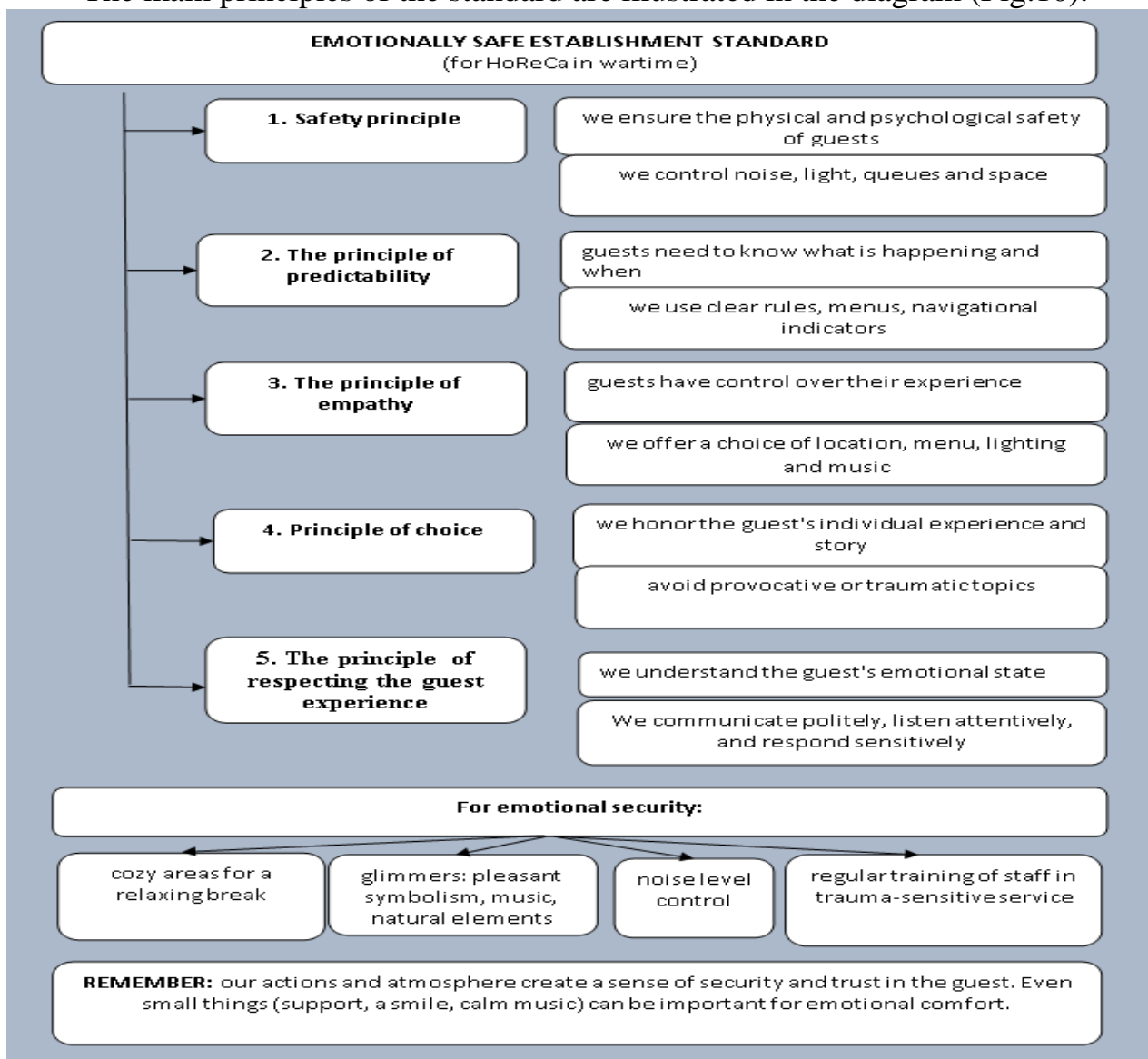


Fig.10. Proposal for HoReCa establishments: «Emotionally Safe Venue» Standard

To assess the effectiveness of implemented practices in hospitality establishments, it is proposed to use *behavioral service KPIs*, which quantitatively measure guests' levels of emotional comfort, safety, and trust and form a basis for managerial decision-making.

Traditional KPIs (such as service speed, cleanliness, and order) reflect only the technical quality of service. However, for guests with war-related traumatic experiences, the emotional and social dimensions of service are crucial, as they determine feelings of comfort, safety, and trust.

The main behavioral KPIs include the level of guests' emotional comfort, perceived physical and psychological safety, intention to revisit the establishment, and the level of trust in both staff and the venue (Table 3).

Table 3. Behavioral Service KPIs

KPI	What Is Measured	Scale	Example Observation / Record
Emotional Comfort Level	How calm and satisfied guests feel	1 – Low 2 – Medium 3 – High	Guest sits calmly, smiles, shows no signs of anxiety
Emotional Comfort Level	How calm and satisfied guests feel	1 – Low 2 – Medium 3 – High	Guest sits calmly, smiles, shows no signs of anxiety
Sense of Safety	Physical and psychological safety of guests	1 – Low 2 – Medium 3 – High	Guest chooses a seat independently, stays in an area free from noise/stress triggers
Willingness to Return	Readiness to revisit the establishment	1 – Unlikely 2 – Maybe 3 – Definitely	Guest inquires about upcoming events or opening hours
Trust Level	Trust toward staff and the establishment	1 – Low 2 – Medium 3 – High	Guest openly asks questions, shares preferences, accepts staff suggestions
Technical KPIs	Cleanliness, service speed	1 – Low 2 – Medium 3 – High	Time of food delivery, room condition, quality of service

For comparison purposes, technical KPIs such as cleanliness and service speed are also included. The behavioral KPI workflow involves data collection, observation recording, and analysis, enabling managers to identify strengths and weaknesses in service delivery, track trends, and implement improvements (Fig. 11).

This approach ensures systematic improvement not only of technical but also emotional and social components of service, which is especially important for guests with heightened psychological sensitivity.

Following the evaluation of behavioral KPIs, it becomes evident that guests' emotional comfort and psychological safety directly influence loyalty and willingness to return.

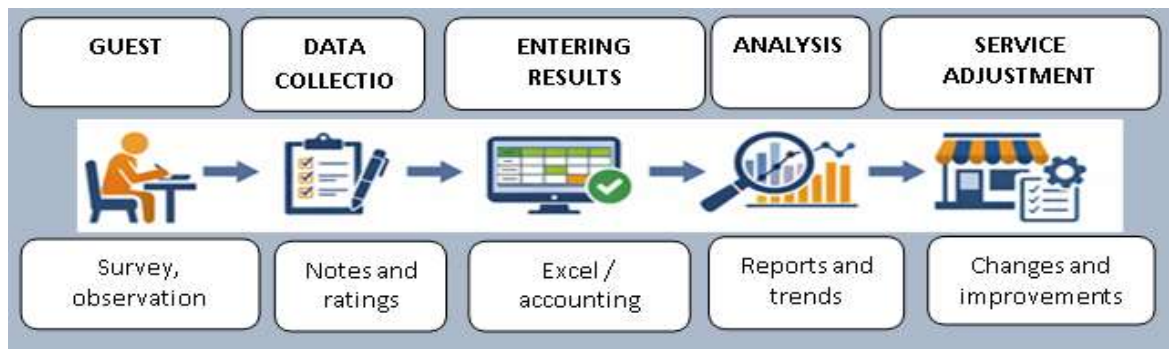


Fig. 11. Process of collecting and analyzing behavioral service KPIs

Within neuro-oriented approaches, particular attention is drawn to cases where hotels consider emotional comfort not only for people but also for animals. For example, in 2024, the Prince Kyoto Takaragaike hotel in Kyoto, Japan, closed a guest room for six months to allow a Japanese flying squirrel to safely raise its offspring, while staff observed from a distance without interference [15].

Such cases indicate the presence of an empathetic service culture based on understanding stress, safety, and psychological well-being. Attentiveness to animals' needs often reflects broader sensitivity to guests' emotional needs, increasing trust, loyalty, and positive brand perception. Even months later, guests are willing to return to establishments where they experienced care and safety, highlighting the long-term reputational impact of neuro-oriented service practices.

The collected behavioral KPI data form the basis for developing an economic model explaining the impact of trauma-informed service on hospitality businesses. The model illustrates a logical chain from implementing emotional safety principles to increased guest loyalty and measurable economic outcomes.

The following diagram presents the economic model of trauma-informed service in the hotel, restaurant, and tourism sectors. It demonstrates how emotional safety practices and stress-trigger management influence guests' psychological well-being, satisfaction, and loyalty, ultimately affecting financial performance (Fig. 12).

The purpose of the model is to provide managers with a practical tool that enables them to:

- systematically assess the impact of trauma-informed service on guest and tourist behavior;
- identify key service touchpoints influencing loyalty and repeat visits;
- evaluate the economic effects of implemented practices;
- design KPIs to monitor the effectiveness of service interventions.

The model is intended for hotel, restaurant, and tourism managers, service management professionals, and hospitality consultants seeking to increase revenue through improved guest experience.

Applying the model allows organizations to structure service improvements, evaluate emotional safety practices, and make informed managerial decisions that support repeat visits and long-term revenue growth. Overall, the proposed framework integrates guests' psychological comfort with economic efficiency and serves as a practical management tool.

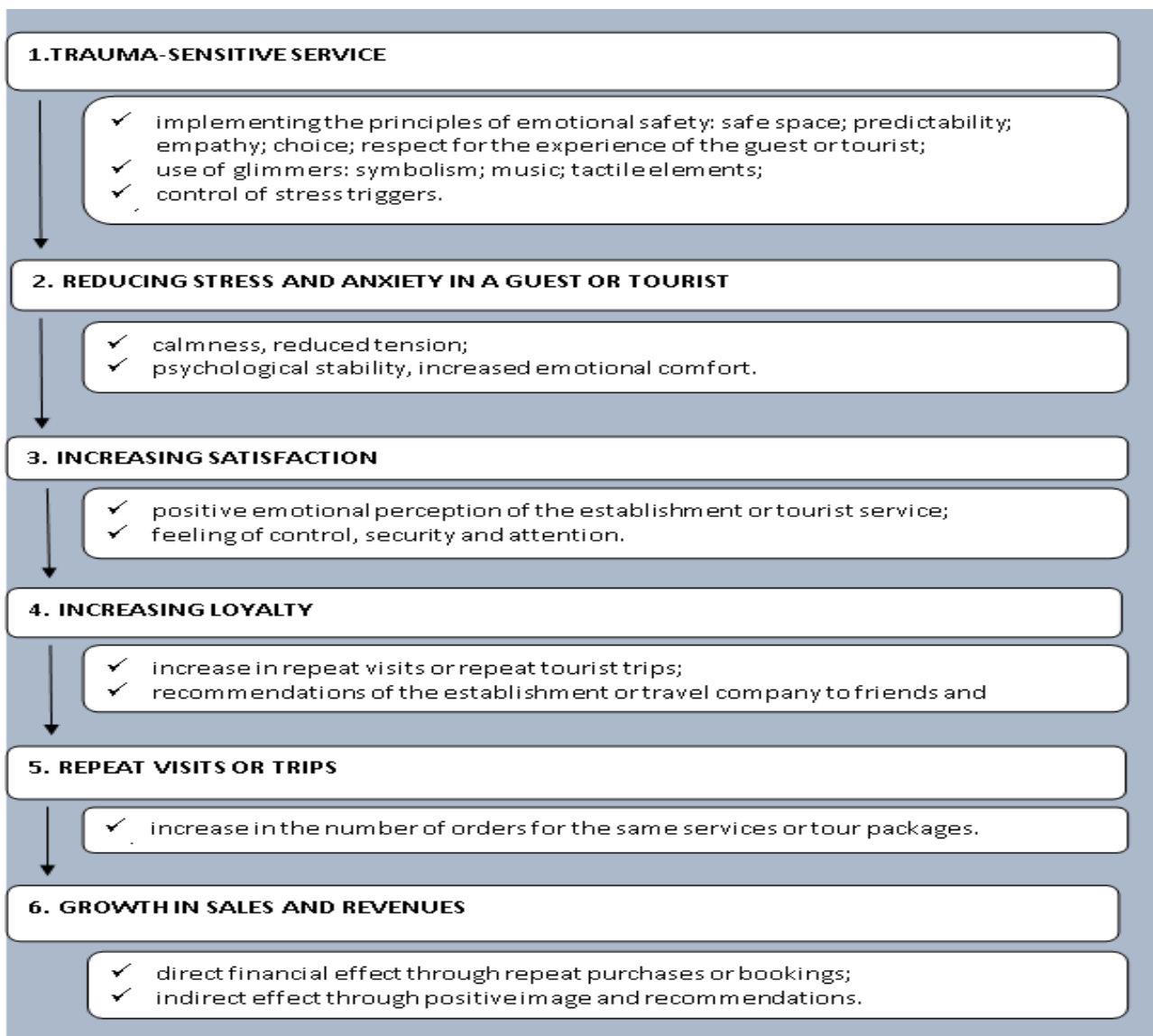


Fig. 12. Economic model of the impact of trauma-informed service on the hospitality and tourism industry

The developed instruments of trauma-informed service – behavioral risk mapping, staff standards, and behavioral KPIs – together form an integrated system that links emotional safety with sustainable business performance.

V. CONCLUSIONS

The study showed that integrating neuro-behavioral technologies into the HoReCa and tourism sectors allows a shift from intuitive service management to a scientifically grounded approach that considers guests’ subconscious responses to sensory stimuli and psychological state, particularly for clients with war experience or internal displacement.

The developed trauma-informed service concept introduces a new level of management: replacing stress “triggers” with safety “glimmers” fosters guests’ psychological comfort, increases trust, and encourages repeat visits. This approach is not only socially significant but also practically implementable in HoReCa establishments and tourism companies.

Implementing the trauma-informed service concept and adaptive tools for managing guest behavior enhances psychological comfort, loyalty, and satisfaction, which, based on observations, can potentially improve financial performance through higher repeat visits and average check value. This makes trauma-informed service strategically beneficial for both managers and investors.

A comprehensive research approach – including in-depth interviews, observations, staff surveys, and consultations with psychologists – allowed the systematization of typical sensory and behavioral triggers, as well as the development of practical tools for their mitigation. This provides a foundation for building a universal model of trauma-informed service in the hospitality and tourism industry.

The scientific novelty of this work lies in the implementation of the «triggers» and «glimmers» concepts, the development of behavioral KPIs, and the creation of a system that links guest psychological safety with the economic efficiency of establishments. The proposed methods can serve as a guide for managers, consultants, and researchers aiming to combine customer-centricity with strategic management in HoReCa and tourism businesses.

The results demonstrate that even small changes in sensory environments and staff behavioral standards can significantly impact guests' emotional state, opening prospects for further research in neuro-behavioral technologies and trauma-informed service in both global and local contexts.

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