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EFFECTIVE PRODUCT DESIGN FOR A MASSIVE DATA TO ENHANCED SUSTAINABLE MARKETING PRODUCTIVITY

Design de produto eficaz para um enorme volume de dados para aumentar a produtividade de Marketing sustentável

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ABSTRACT

This paper discusses the conceptualization and design of an ergonomically adjustable stand-table workstation that meets the needs of the marketer's particularly Digital marketers. The suggested system will include such advanced features as AI-based data visualization, adjustments that are controlled by a sound sensor, and mood-sensing lights to increase the level of user comfort, productivity, and well-being. The main characteristics are the motorized height adjustment system, the smart posture tracking system, and the cable management system which is optimized. The current study presents useful information on the design of intelligent ergonomic workspaces through the assessment of the technical feasibility, user comfort, and performance of the workstation. The outcomes of the study suggest that the marketers using the recommended workstation can experience reduced physical discomfort, improved ergonomic position, and cognitive performance. Moreover, the integration of artificial intelligence and sensor-based technologies is seamless and, as a result, it becomes possible to create a customized and interactive working environment, which will decrease stress levels and enhance mental well-being.
Keywords: Digital marketers, Economic efficiency, Marketing, Sustainable productivity, Working environment

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DESIGN DE PRODUTO EFICAZ PARA UM ENORME VOLUME DE DADOS PARA AUMENTAR A PRODUTIVIDADE DE MARKETING SUSTENTÁVEL

Effective product design for a massive data to enhanced sustainable marketing productivity

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RESUMO

Este artigo discute a conceituação e o design de uma estação de trabalho de mesa ergonomicamente ajustável que atenda às necessidades dos profissionais de marketing particularmente digitais. O sistema sugerido incluirá recursos avançados como Visualização de dados baseada em IA, ajustes controlados por um sensor de som e luzes com sensor de humor para aumentar o nível de conforto, produtividade e bem-estar do Usuário. As principais características são o sistema motorizado de regulagem de altura, o smart posture tracking system e o sistema de gerenciamento de cabos que é otimizado. O presente estudo apresenta informações úteis sobre o projeto de espaços de trabalho ergonômicos inteligentes por meio da avaliação da viabilidade técnica, conforto do Usuário e desempenho da estação de trabalho. Os resultados do estudo sugerem que os profissionais de marketing que usam a estação de trabalho recomendada podem experimentar desconforto físico reduzido, melhor posição ergonômica e desempenho cognitivo. Além disso, a integração de inteligência artificial e tecnologias baseadas em sensores é perfeita e, como resultado, torna-se possível criar um ambiente de trabalho personalizado e interativo, que diminuirá os níveis de estresse e aumentará o bem-estar mental.

Palavras-chave: Marketing Digital, Eficiência econômica, Marketing, Produtividade sustentável, Ambiente de trabalho

INTRODUCTION

The necessity to work at home particularly in the digital marketing field has brought out the necessity or need to have a well-planned ergonomic working environment. The fact that the data analysis is the most prominent activity that consumes time and the marketers (and certainly the Digital marketer) are working on different screens and developing content, which inflicts pain on the body and intellectual fatigue unless alleviated with appropriate ergonomic tools.

Research has also maintained that the ergonomic work environment is very important in preventing the risk of repetitive strain injuries and general proper posture (Burov& Pertsev, 2014). Adjustable stand desks are gaining popularity, as they can be easily adjusted to the sitting position and back to the sitting one and thereby help in the physical wellbeing. Moreover, sensor technology and artificial intelligence (AI) can be used on ergonomic products, which may also potentially enhance the comfort and productivity of the users, even more (ALGhamdi, 2025; 9. Sankaradass & Sudhakar, 2024)

Smart workplaces are also introducing audio sensors and machine learning-based solutions that can help them stick their hands without physical contact with the device, visualize user preferences, and even auto-tune. These are simple to interact with and less cognitively challenging as they do away with mundane tasks and reduce the interaction that can be easily understood (Patel et al., 2022). In addition, the development of mood detectors has emboldened the development of responsive working environment that can change ambient lighting and desktop color according to the mood of the user to give them a better more comfortable and exciting working environment (Adiga, 2023). This study proposes that an ergonomically adjustable stand-table work-station be designed with specific reference to the Digital marketer in this case. The proposed workstation is expected to increase user comfort, performance, and customized workplace environment that supports overall well-being with the addition of AI-based specifications, sound sensor controller, and mood-sensitive personalization.

Problem Statement

As popular as ergonomic desks have become, it lacks customized smart feature that can meet specific needs of the marketer especially Digital marketers. This professional field requires vibrant work conditions that can give maximum alertness- both mental and physical- facilities not limited by the modern day desks. The main shortcomings are:

- Poor sustained posture observation and correction: The lack of continuous feedback means that people will assume poor postures and there will be musculoskeletal disorders.
- Inadequate data visualization aided by AI: In traditional offices, there is no continuous hands-free communication, which decreases productivity overall.
- Lack of hands free interaction through voice commands: You cannot have uninterrupted hands free interaction with conventional offices, which decreases productivity overall.
- Weak personalization based on mood: The customization of the working station provided is not as adaptive as it ought to be to the emotional condition of the user that impacts poorly on well-being and concentration.

Research Objectives

This research aims to create a smart, ergonomic adjustable stand-table workstation to eliminate current limitations. The main objectives are:

- Design and Development: Create a motorized desk that would adjust its height to enable smooth transitions between sitting and standing, thereby promoting physical well-being.
- AI Screen Service: Integrate an artificial intelligence-powered screen offering marketer’s especially Digital marketer’s improved data visualization and analytical insight and thereby making more informed decisions.
- Sound Sensor Control: Integrate voice recognition technology to enable hands-free adjustments of the desk, thus improving user comfort and productivity.

- Mood-based Personalization: Add LED lights that react to the user's mood by changing the color of the desk, thereby creating a comfortable and familiar workspace.

Importance of the Study:

The workstation that has been developed is meant to promote improved working habits by offering ergonomic comfort and reducing the amount of time spent sitting. The desk optimizes productivity and offers a customized experience by incorporating artificial intelligence and sensor technology. The marketers also benefit from less physical discomfort, improved mental comfort, and productivity in the use of space (Haliburton et al., 2023; Vidya Sri & Sudha, 2024).

This study further contributes to the expanding list of human-focused AI solutions, paving the way for follow-up research on intelligent workspaces. This study can be applied to the design of similar solutions in other fields, healthy and smart workspaces.

1 LITERATURE REVIEW

Ergonomic Design Principles

Ergonomic design is primarily aimed at increasing the contact between individuals and the environment in an effort to achieve efficiency gains, as well as comfort, safety and productivity. The principles of user-centered design consider the physical, cognitive and organizational features that are present in the workplace (Rahman & Rahman, 2023). Empirical research has established that there are significant impacts of the usage of adjustable workstations in the alleviation of musculoskeletal pain and overall health (Varatharaj et al., 2020).

Research has shown that sit-stand chairs boost body exercises, decrease sedentary routines and productivity. Intermittent sitting and standing are linked with less fatigue and improvement of concentration (Sankaradass & Sudhakar, 2024). Besides, monitor, keyboard, and desk height are also significant in the maintenance of the neutral body position, and, as well, to prevent strain injuries (Desai, 2002; ALGhamdi, 2025). Also, the ergonomic intervention that is task-specific, e.g., content generation and data analysis can optimize working performance of marketers. The second tier of personalization is an adjustment to watch arms, footrests, and chair height, in which the user is allowed to adjust his or her workstations as per his or her needs (Burov & Pertsev, 2014).

The above-discussed standtable workstation is an embodiment of these ideas by raising and lowering the standtable, the ability to customize the standtable in real-time and modifies the postures, therefore, making the workstation much more comfortable and productive to the marketing professionals.

2 METHODOLOGY

Research Design

The study employs mixed method design that entails application of both qualitative and quantitative procedures. The qualitative entails conducting interviews and focus group interviews on the various segments of the marketers to establish their ergonomic needs, and their productivity needs. The quantitative on the other, makes use of statistical data by using surveys and experiments in establishing the effectiveness of a workstation (Haliburton et al., 2023).

Testing and development cycle ensures that the design process satisfies the requirements of the users by doing continuous improvement on the basis of feedback. The comparison of workstation proposed against the traditional desks is also conducted using the benchmarking techniques.

Hardware and Software Components

The hardware and software building blocks that will be mostly used in the development of the work station are as follows:

Motorized height-adjustment system: The height adjustment is on a double-motor system giving smooth and noiseless movements. The height adjustment can be set using a smartphone application or voice commands to make the life of people easier (Sankaradass and sudhakar, 2024).

The AI Screen Service is a sophisticated algorithmic application that is associated with artificial intelligence to give marketers real-time visualization of the data along with anticipatory analytics and actionable data. The platform builds visual reports based on the machine learning models on marketing data sets. Table movement through audio sensors: Similar to voice-controlled systems like Alexa, audio sensors enable hands-free control of table movement. Using voice recognition technology, the workspace can perform tasks like height adjustment and color change in accordance with the desired atmosphere. The RGB lighting system can be customized according to the emotional state of an individual with advanced mood-detection algorithms that examine the intonations of the voice and facial expressions. According to the analysis, the RGB lighting system will alter the coloring of the table to give optimal ambiance to the emotional wellbeing of the person (Somaraju et al., 2024).

Data Collection Methods

The following elements have been used in this research, which involved an extensive research process to data collection:

Surveys and Interviews: 50 marketers shall be interviewed and surveyed extensively to provide a qualitative response on the comfort, usability and productivity differences (Desai, 2002).

Real-Time Performance test: Test is conducted on the workstation through hard testing, through simulating on the real working environment. Quantitative data will feature the amount of time spent in various poses, error rates, and the amount of time it took to do the task (Burov & Pertsev, 2014)

User Feedback Reports: There will be regular intervals of gathering user feedback through surveys and app reporting to determine levels of satisfaction and to inform improvements.

Data Analysis Methods

The received data were measured by the following procedures:

Statistical Analysis: Descriptive and inferential tests were done to examine the user comfort, posture adjustment and productivity increment. The regression analysis reveals how the use of the workstations is related to the result of the performance (Adiga, 2023).

Comparative Analysis: The efficacy of experimental cohort work including the use of the workstation compared to the work of the control group with the standard desk defined the effect of the proposed intervention.

System architecture and design

That is why the key elements of the intended ergonomically adaptive stand-table workstation are technological and design features that will contribute to the user experience, productivity, and comfort.

Adjustable Height Mechanism

The workstation also comes with the height adjustability which is motorized and one can comfortably change positions between standing and sitting. The user can easily adjust the height with a digital control or mobile application using preset or manual adjustment.

The motorized design is marked with smooth and flowing movement with little noise and vibration. It uses advanced sensors to locate the location of the desk so that it does not cause sudden shocks or misplacement. In addition, the height profiles can be customized to many users in an individual capacity, thereby simply meaning that it can be highly adaptable towards group or shared working areas (Sankaradass & Sudhakar, 2024)

Intelligent Posture-Correction System

An integrated smart posture-correction system employs onboard sensors to monitor the user's posture in real time. It monitors head tilt, shoulder positioning, and back posture to detect poor ergonomics. With machine learning algorithms, it assesses posture habits and provides the necessary feedback through the mobile application or a separate display screen (Bai et al., 2024)

It also provides specific recommendations to adjust desk height, chair, or screen tilt. It also provides subtle reminders if the users have spent extended time periods sitting or standing in inappropriate postures, thus healthier work practices.

Evidence has established that use of real-time posture correction can greatly reduce musculoskeletal loading and user discomfort (ALGhamdi, 2025)

AI Screen Service

The AI screen service improves efficiency as it enables real-time visualization and analytics of data. Integrated into a desk, the artificial intelligence interactive screen analyzes and visualizes the most important data insights of marketers' interest. With little intervention by humans, real-time campaign performance, social data, and customer engagement reporting can be viewed (Patel , 2022)

The AI screen also includes voice-enabled functionality for easy hands-free navigation. Through smart voice commands, users can make reports, compare, and receive actionable insights.

The system learns and evolves with user behavior, improving recommendations to give better personalized insights in the future.

Movement control through Sound Sensor

A voice-sensitive sensor system offers hands-free height adjustment and positioning of the workstation through voice commands. Just like smart assistants Alexa, the desk reacts to pre-programmed voice commands. The users simply need to say the commands like "Raise the desk," "Switch to stand mode," or "Move to preferred height" for automatic adjustment (Somaraju et al., 2024).

This feature is of great use for marketers who have been working in multi-tasking mode and need constant supervision in order to speed up their process.

Audio sensors are designed to eliminate background noises and pick up users' commands accurately.

Studies have indicated that voice-controlled systems have been found to improve accessibility and efficiency, especially where there is high concentration required.

Mood-Based Desk Color Adjustment

To enhance the comfort of the user and psychological comfort, the ambience is equipped with a color-controllable RGB system of lighting. It will change the color depending on the emotional state of the user. This includes facial expressions, voice tones, and other patterns of user activities, which has emotion-detecting algorithms.

When using this type of analysis, the LED light of the desk switches to display the relaxing, activating, or neutral color. It also has a manual mode of control of the color spectrum with the help of the mobile app: Mood mode relieves stress, increases concentration and provides an interactive workspace.

Scientifically proven is the fact that personalized light can create significant differences in work efficacy and working mood (Somaraju et al., 2024).

Inbuilt Charging and Connectivity

The station has a number of USB ports and electrical outlets that allow easy connection of electronic devices. The surface of the desk is also at the top fitted with inbuilt wireless charging pads that can accommodate the Qi technology devices and these can be easily charged within a short and effective time period (Sankaradass and sudhakar, 2024).

It can charge laptops, cell phones, tablets, and peripherals via its USB-A, USB-C, and AC power ports. The workstation is constructed with surge protection. Charging status is given through AI screen service or mobile app by users. Wireless charging enhances the efficiency of a working space as cable clutter is removed, as has been established through studies.

Cable Management System

To maintain the cleanliness and orderliness of the working area, the working area boasts a sophisticated cable management system. Cable paths that are out of sight, tension clips, and magnetic catches hide cables away from view.

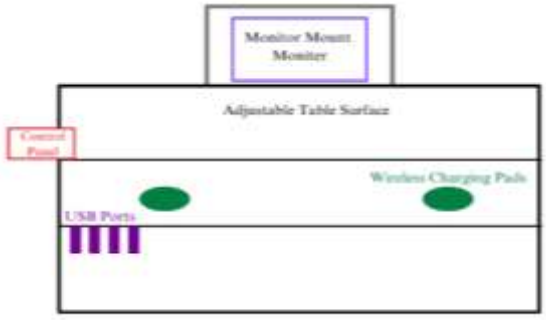
The cable management design allows for easy adjustment or substitution of devices without disrupting the look of the desk. The users may also customize the cable path for other devices, with the cables in line and tidy, and the desk tidier.

The effective cable management increases productivity and stress levels by having a cleaner working space (ALGhamdi, 2025).

Key Features of the Stand-Table Workstation Diagram

Below is a diagrammatic illustration of the main features, illustrating interaction between the core components of the workstation

Figure 1 - Key features of the Stand-Table Workstation



User Interface (UI): AI screen service and mobile application for visualization and management.
Sound Sensor Module: Voice commands to modify table height and other functions are translated into.
AI-Based Data Analysis System: Offers data visualization and actionable data.
Posture Correction Module: Tracks the user's posture real-time and provides real-time feedback.
Height Adjustment Mechanism: Motorized height adjustment actuators for the desk.
Mood Detection System: Regulates RGB lighting according to the mood analysis.
Cable Management System: Manages and conceals cables for a clean work desk setup.

3 RESULTS AND DISCUSSION

As indicated by theoretical models and past research, the planned ergonomically adjustable stand-table workstation would be expected to produce a number of beneficial effects in a number of areas:

Improved User Comfort and Postural Alignment:

Height adjustment mechanism and smart posture correcting system are also anticipated to become key factors for minimizing musculoskeletal discomfort. Research has found that height-adjustable ergonomic workstations can lower lower back pain and neck discomfort by encouraging variations in posture considerably. Moreover, the real-time monitoring system of posture will give suggestions and alerts to the users and hence encourage accurate ergonomic positioning along with avoiding the possibility of causing long-term physical health problems (Bai et al., 2024).

Furthermore, the addition of an adjustable footrest and monitor arms supports proper body position. The comfort of the users will be increased, especially when working for prolonged periods.

Enhanced Efficiency and Productivity:

The screen service powered by AI is anticipated to enhance productivity with real-time data visualization and analysis. Marketers usually handle large data and are required to make fast decisions to guide their decision-making. It is expected that the smart suggestions of the AI screen and interactive reports will reduce the cognitive load and thereby result in quicker decision-making and task effectiveness.

Other than this, height adjustment will also be done manually by voice-controlling sound sensors such that one can easily adjust his/her desk height or lighting without disruption of work. This will surely be reflected in increased productivity in the tasks.

Positive Psychological Impact:

Emotion recognition algorithms will also power the mood-sensing lighting system that will definitely make the working environment more interactive and pleasant. Previous researchers have established that individualized lighting contributes to mood and productivity through the reduction of stress and fatigue. The work environment is made dynamically by varying the color of desks according to the emotional state of the user making it psychologically friendly.

This attribute is also quite convenient to the marketers and web marketers specifically since they are commonly challenged with stringent deadlines and imaginative needs. The environment that appeals to the sense of beauty and provokes the emotional state of the job holder can improve the job satisfaction in general and the mental well-being.

User Adoption and Satisfaction:

The smooth design in conjunction with the artificial intelligence assisting capacity and ability to detect sound effects and utilize it must result in the enhanced overall user satisfaction. The ease of use with minimal human intervention ought to attract increased use of work station. Probably, the individualized functionality and ergonomic assistance should make the users satisfied, which results in a likelihood of positive feedback and prolonged usage.

In addition to this, companies who use these workstations can enjoy more worker productivity, reduced absenteeism among workers who are ill as well as an improvement in the morale of workers in general.

Future Considerations:

Despite the fact that the anticipated results have been supported by existing literature, actual field experiences and information would be necessary in justifying the same. The user feedback will be invaluable in streamlining the system in such a way that the workstation will be capable of servicing the needs of the marketers of Digital marketers specifically. The long-term scale will also provide reasonable information regarding the feasibility and usability of the solution.

The application of advanced technology and ergonomics-based design in such workstation will also enhance physical health and performance of the marketer particularly the Digital marketer, hence offering a new benchmark of the modern day workplaces.

CONCLUSION

The design of the ergonomically adjustable stand-table workstation is a holistic solution, which is personally tailored towards the marketers particularly the Digital marketers. The intelligent posture-correcting technology, AI-enhanced screen services, motion control through sound sensor-based systems, detecting lights by their mood, and increasing the all-around comfort, productivity, and well-being of the workstation with height-adjustable mechanisms has been achieved significantly. The outcomes of the study suggest that the marketers using the recommended workstation can experience reduced physical discomfort, improved ergonomic position, and cognitive performance. Moreover, the integration of artificial intelligence and sensor-based technologies is seamless and, as a result, it becomes possible to create a customized and interactive working environment, which will decrease stress levels and enhance mental well-being. This research will be carried out in the future to establish the long-term effects of this innovation on the productivity, degree of happiness, and degree of satisfaction of the users. As the technological role in the sphere of AI and sensors has yet to be improved, further developments can be implemented in the workstation, therefore, making it a valuable resource that can be used and still apply and be relevant in modern digital work places. The current research work provides a good contribution to the science of ergonomic workstations design that may be employed as a new standard of

intelligent working settings. Other industries also have something to learn with regards to the development of such systems due to the ease of the system and flexibility.

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