

THE STUDY OF STRESS AND WORK-LIFE  
BALANCE PROGRAM AT BI TECHNOLOGIES  
CORPORATION SDN BHD ON COGNITIVE  
ERGONOMICS FUNCTIONS TO IMPROVE  
WORK PERFORMANCE

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## **SUPERVISOR'S DECLARATION**

We hereby declare that we have checked this thesis and, in our opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Doctor of Philosophy.



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I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

A handwritten signature in blue ink, consisting of a vertical line and a diagonal line crossing it.

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FUNCTIONS TO IMPROVE WORK PERFORMANCE

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Thesis submitted in fulfillment of the requirements  
for the award of the degree of  
Doctor of Philosophy in Human Sciences

Centre of Human Sciences  
UNIVERSITI MALAYSIA PAHANG

AUGUST 2022

## ACKNOWLEDGEMENTS

First and foremost, I would like to express my heartfelt thanks to Allah, the Almighty, for giving me this opportunity and giving me the ability to proceed successfully.

Sincere thanks and gratitude goes to my honourable supervisor, Professor Muhammad Nubli Bin Abdul Wahab for his guidance, patience and good attention to my work, and of course without his support and good advice it would have been impossible to finish this work on time. Also thanks to my co-supervisor Dr Ezrin Hani Sukadarin who helped a lot in this research and also special thanks to Dr Auditya Purwandini Sutarto for her support.

I am thankful to Universiti Malaysia Pahang (UMP) and BI Technologies Corporation for financial support under matching grant RDU192404.

I am indebted to my superior at BI Technologies, Mr. Podzi as Operations Director and Mr. Akhyani as Operational Excellence Manager who allowed me to conduct the research, as well as giving guidance and helping me to finish my thesis. It would have been for impossible for me to obtain real data for this thesis if I had not obtained the support of my supervisor who allowed me to carry out my research in the company in Kuantan.

I owe my deepest appreciation and gratitude to my family for their unflagging love and unconditional support throughout my life and study especially my beloved parents Haji Mahmad Khairai bin Osman, Hajah Zaiton binti Salleh also my lovely beautiful wife Nurul 'Atikah binti Asmuni and our precious princess Zara Zinnirah binti Kamarulzaman who has always been at my side to encourage me in the completion of this thesis.

Special thanks to my friends who gave me their time, moral support, guidance and help to finish my thesis. The support from my friends has been very important for me to complete my thesis in time.

## ABSTRAK

Pengendalian tugas menggunakan manusia sukar dihilangkan kerana terdapat pelbagai jenis tugas yang memerlukan manusia secara terus sebagai sumber utama untuk melaksanakannya. Tenaga manusia diperlukan dalam industri hari ini, seperti fungsi kognitif manusia untuk beroperasi dalam bidang pengeluaran. Kajian ini adalah untuk menangani masalah psikologi di kalangan para pekerja untuk menilai sama ada mereka mempunyai tekanan dan juga kajian tentang “Heart Rate Variability (HRV) coherence ratio”, “Satisfaction With Life Scale (SWLS)” dan produktiviti pekerja. Tujuan utama kajian ini adalah untuk membina modul and melihat keberkesanan modul tersebut kepada hasil kerja pekerja dari sudut produktiviti. Modul merangkumi latihan “Heart Rate Variability (HRV)”, pengurusan peribadi, pengurusan kerja dan peningkatan kerohanian. Pekerja dipilih berdasarkan “Depression Anxiety Stress Scale (DASS)” untuk sesi intervensi, 36 daripada keseluruhan 319 pekerja dengan stress skor tinggi dan rendah dibahagikan kepada “Treatment Group” dan “Control Group”. Modul telah dibangunkan dalam kajian ini untuk memantau “physiological measures”, “coherence ratio”, “Satisfaction With Life Scale (SWLS)” dan produktiviti pekerja di bahagian pengeluaran. Modul tersebut adalah sebagai alat untuk program pengurusan “Work-Life Balance (WLB)” yang ditubuhkan untuk mengurangkan stres pekerja sambil menyediakan pengurusan tekanan yang mempunyai maklumat berkaitan untuk menggalakkan suasana “Work-Life Balance (WLB)”. Pekerja yang terpilih diukur pada sebelum dan selepas pelaksanaan lapan “intervention session” dalam tempoh dua bulan. Setiap minggu mereka akan mengadakan sesi untuk melatih pekerja berkenaan pelaksanaan modul. Hasilnya menunjukkan bahawa pekerja yang dipilih untuk sesi intervensi berjaya meningkatkan nilai purata skor coherence daripada 0.67 kepada 1.28, mengurangkan nilai purata tekanan dalam DASS daripada 45.9 kepada 29.1, meningkatkan nilai purata skor purata “Satisfaction With Life Scale (SWLB)” daripada 5.57 kepada 6.26 dan meningkatkan produktiviti pekerja dengan membandingkan keadaan sebelum dan selepas. Melalui kajian ini semua pekerja yang terpilih untuk sesi intervensi menunjukkan penambahbaikan dari sudut produktiviti pekerja secara purata sebanyak 10% bagi keseluruhan kilang terhadap tempat kerja mereka. Selepas pekerja memperbaiki fungsi kognitif ergonomik pasca sesi intervensi, bahagian tugas pemeriksaan mekanikal visual menunjukkan peningkatan produktiviti paling banyak iaitu 13%. Ini membuktikan bahawa modul “Work-Life Balance (WLB)” berkesan untuk memperbaiki hasil kerja pekerja dari sudut produktiviti juga meningkatkan tahap kesejahteraan di antara pekerja kilang.

## ABSTRACT

The judgement of human in industry is difficult to eliminate because there are various types of tasks that need human as a main source of performance. Cognitive functions of employees are positively related to stress level, body and mind condition to operate the production line. This study attempts to address the stress problem among operators also a study on Heart Rate Variability (HRV) coherence ratio performance, Work-Life Balance (WLB) and worker's productivity. The main objective of this study is to develop a Work-Life Balance (WLB) module and to study its effectiveness in employee's productivity performance. The Work-Life Balance (WLB) module developed comprises of Heart Rate Variability (HRV) training, personal management, work management, and spiritual enrichment checklist. A group of employees were selected based on the Depression Anxiety Stress Scale (DASS) score for intervention sessions, 36 from total 319 employees with high score and low score were divided into Treatment Group and Control Group. The Work-Life Balance (WLB) module was used to monitor the HRV score, Satisfaction With Life Scale (SWLS), and productivity of employees in production area. The Work-Life Balance (WLB) module was used for employees to reduce stress while providing information to promote a Work-Life Balance (WLB) environment. The selected employees' performances are measured after eight intervention sessions in a 2 month period. Every 2 weeks they will have a session to strengthen the Work-Life Balance (WLB) module implementation. The result shows that employees in the Treatment Group are able to increase HRV coherence ratio score from the mean value of 0.67 to 1.28, reducing stress level from the mean value of 45.9 to 29.1, improve Satisfaction With Life Scale (SWLS) score from the mean value of 5.57 to 6.26 and increase worker's productivity by comparing pre and post-condition. From this study, all employees that were selected for intervention session showed improvement in terms of employee productivity by an average of 10% in overall plant performance in production area. As employees improve their cognitive ergonomics function on post intervention sessions, visual mechanical inspection workstation showed the highest productivity improvement with an average of 13%. The results indicate that the Work-Life Balance (WLB) module can be used in an electronics industry company to improve work performance as well as increasing the wellness level among factory employees.

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## LIST OF ABBREVIATIONS

HRV	Heart Rate Variability
DASS	Depression Anxiety Stress Scale
WLB	Work-Life Balance (WLB)
SOP	Standard Operating Procedure
EES	Employee Engagement Survey
WMSDs	Work-related Musculoskeletal Disorders
ULF	Ultra-Low-Frequency
VLF	Very-Low-Frequency
LF	Low-Frequency
HF	High-Frequency
FFT	Fast Fourier Transformation
PNS	Parasympathetic Nervous System
SNS	Sympathetic Nervous System
BP	Blood Pressure
HR	Heart Rate
RSA	Respiratory Sinus Arrhythmia
RF	Respiratory Frequency
TG	Treatment Group – High Stress Employee
CG	Control Group – Low Stress Employee
CTRT	Choice Theory Reality Therapy
ADDIE	Analysis, Design, Development, Implementation, Evaluation

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