

UNDERCURRENTS OF THE CHANGES TO WORK THAT AUTOMATION BRINGS

DISSERTATION

to obtain
the degree of doctor at the University of Twente,
on the authority of the rector magnificus,
prof. dr. T. T. M. Palstra,
on account of the decision of the graduation committee,
to be publicly defended
on Wednesday, the 25th of April, 2018 at 16:45 hrs.

by

Michael Anthony Keane

born on the 1st of January 1965
in Evergreen Park, Illinois, United States of America

Acknowledgments

There are so many instances of guidance and support that I have received from Prof. Dr. Celeste P. M. Wilderom that I will fall short in expressing this in a way that accurately reflects what her efforts were. It is undeniable that her efforts of support and guidance are primary reasons that I have completed this journey and I give her my profound thank you for this.

I am also forever indebted to my friend and advisor Prof. Dr. Tojo Thatchenkery. His guidance and support were and are invaluable and I am truly enriched because of his efforts. The support and guidance that he has provided to me is also a primary reason that I have completed this journey. Thank you brother Tojo.

To the members of my graduation committee I say thank you for your time and efforts on my behalf. It is humbling that all of you have sacrificed your time to consider the ideas and passions that animate me.

I must also acknowledge and express my deep gratitude to Prof. Dr. Sheila McNamee and those at the Taos Institute without which my journey could not have begun.

To my brother and sister sheet metal workers I say that you have enriched my life and provided the inspiration for the curiosity which led to this endeavor and I thank you for this.

To the University of Twente I simply say thank you for this opportunity. It may be that I did not deserve this opportunity, but you nonetheless provided one for me and I am indeed grateful.

To my family who through all the highs and lows of this journey as well as the journey called life, you have always been there with loving support and I thank you for this! I especially say thank you to our beautiful daughter Megan for her time and efforts designing the cover of this book.

To my brother and sister ODKM cohort #2 members and professors at grad. school I cannot thank you enough for the experiences that you gave to me at George Mason University. The conversations that we had were an impetus for me to want to learn more.

Lastly, while I cannot possibly name everyone who has been supportive and an inspiration to me on this journey, I say, nonetheless, that I am forever grateful for your friendship and support.

Table of Contents

| | |
|---|----|
| Chapter One: Introduction | 1 |
| Introduction | 2 |
| Background of the Problem..... | 2 |
| Statement of the Problem..... | 8 |
| Purpose of the Study | 10 |
| Research Questions | 14 |
| Research Hypotheses..... | 14 |
| Importance of Study..... | 15 |
| Scope of the Study..... | 16 |
| Summary | 17 |
| Chapter Two: Literature Review | 19 |
| Literature Review | 20 |
| Introduction to Literature Review | 20 |
| Technology and Skilled Work..... | 26 |
| Technology and the Worker..... | 42 |
| Literature Regarding Adoption of Technology..... | 51 |
| Literature Specifically Related to the Unionized Workforce..... | 59 |
| Resistance to Change | 64 |
| Readiness for Change..... | 78 |
| Summary and Conclusion of Literature Review | 84 |
| Chapter Three: Research Method | 87 |
| Introduction | 88 |
| Quantitative Research..... | 89 |
| Cohort Design | 89 |
| Participants | 90 |
| Instrumentation..... | 92 |
| Instrument..... | 93 |
| Research Procedures | 93 |
| Measures..... | 97 |
| Data Analysis | 97 |

| | |
|--|-----|
| Ethical Considerations..... | 99 |
| Limitations of the survey part of this research..... | 99 |
| Summary | 100 |
| Qualitative Research..... | 101 |
| Descriptive Design | 101 |
| Document Analysis | 101 |
| Interpretive Phenomenological Analysis | 102 |
| Data Collection..... | 103 |
| Summary | 103 |
| Chapter Four: Research Findings..... | 104 |
| Quantitative Research Findings..... | 105 |
| Introduction | 105 |
| Results of Quantitative Findings..... | 116 |
| Findings: Latent Class Analysis..... | 152 |
| Qualitative Research Findings..... | 158 |
| Introduction | 158 |
| Results of Qualitative Findings | 158 |
| Summary of Qualitative Findings | 171 |
| Chapter Five: Conclusions, Discussion, Implications, and Suggestions for Future Research ... | 175 |
| Introduction | 176 |
| Conclusions and Discussion..... | 193 |
| Theoretical and Practical Implications..... | 205 |
| Suggestions for Future Research..... | 211 |
| Bibliography | 214 |
| Appendices..... | 229 |
| Appendix One..... | 230 |
| Definition of Terms | 230 |
| Appendix Two | 233 |
| Questionnaire | 233 |
| Appendix Three | 239 |
| Photos of Sheet Metal Worker and Sheet Metal Work | 239 |