

Student name: Huw Chance

Programme: MSc International Innovation Management

Module: Introduction to Industry 4.0

Module code: ACPA7004

Student number: 2031077

Assignment 1 Written Report

Date: 01 April 2022

Lecturer: Jaymie Phillips

Table of Contents

Abstract 3

Introduction 4

Process one..... 5

Process two..... 6

Abstract

The paper considers two processes. Process one being related to the increased efficiencies and savings provided by industry 4.0 technologies. Process two explores the use of industry 4.0 to provide better outcomes for staff and recruitment in an evolving world. The need to take on board the technologies can be seen as not limited to economic gain, but also in human capital and sustainable outcomes.

Introduction

In this paper I will be analysing two different processes, in two different roles that I am employed in.

The first process will look at is a parts ordering process and stock control. This process takes place at Electric Classic Cars (ECC). The company converts classic cars to electric power, utilising second use Tesla electric motor and batteries. I shall explain the current process and how parts are currently ordered, managed and stocked. (Process one)

The second process I have chosen is from my role within Welsh Government. I shall look at the current recruitment process in relation to advancement / promotion pathways open to existing employees. How the process is managed, who is involved and what resources this currently needs. (Process two)

I shall explore how both processes currently work and how using 4.0 strategies, technologies could help improve efficiency and mitigate the shortcomings and issues associated with the current processes.

The paper will involve a concise detailed study of the process employed at present. The paper will then concentrate on what impact on the process can be achieved by employing industry 4.0 technologies. The industry 4.0 technologies will be detailed in bullet point form with an explanation of how they would fit into the existing processes and what positive impact they could have. Within this part of the paper will be details of background research undertaken to back up the choice of technologies and why they may be suitable for the tasks chosen.

The paper will aim to ascertain the benefit of using industry 4.0 technologies. These benefits will be confined to efficiency, ease of use, employee satisfaction, error removal and cost (both economic and social). The paper will also consider the steps needed to implement the intended solutions.

Finally, the conclusion will draw the paper to a close, explaining how the use of industry 4.0 technologies can have an effect on the processes we have chosen.

Process one

Current process:

At present, there is no defined ordering system for parts and consumables at ECC. Parts can be ordered ad hoc by any number of staff members, without any defined system. Parts are ordered from a number of different sources and in many cases, due to the urgency, orders are often duplicated. Items ordered are not kept in one place and due to time pressures; parts are usually fitted on arrival. There is no dedicated parts or stores person. The orders are usually handed to the sales manager, who has little knowledge of the parts required, which can lead to errors, which lead to time pressures and delays. The administration is crude and the office staff battle with the workshop for delivery notes, descriptions and for details of how payments have been made. Several different payment methods are employed, pay-pal, account payments, credit card transactions.

Suggested industry 4.0 technology

"In order for a company to dynamically determine its need for supplies, it is necessary to keep track of their stock. " (1)

- The first part of the process is to establish what framework we are going to catalogue the existing stock we have in place.
- The "big data" we already hold needs to be put into a form, that will enable us to see what parts we use most often, but also into a form that is visible to ALL members of the team: Getting the team in the workshop connected to the office administration. This could take a number of forms, phones, and tablets, central screens. Picture recognition software to enable people in the office environment to source materials and stock without technical knowledge.
- Collaborative planning, forecasting and replenishment (CPFR) Moving a step on from the stocking of parts to an integrated dialogue with suppliers, leading to better solutions and increased ability to innovate. (2)
- Connecting the workshop and the administration to the Internet (the internet of things) *"enabling greater communication and new data driven services based on the increased analytics capabilities"* (3).
- Consider collaborative warehousing of stock, just in time logistics to enable cost efficiencies, space saving and particularly good for volatile demand. (4) This could be with existing businesses, or existing suppliers that already use this method. Much of the mail order sales are done direct from our suppliers to the customer, sometimes with our branding as part of the product.

Process two

Recruitment at Welsh Government could be seen as unique, or if critical it could be seen as out-dated. I am going to concentrate on promotion and applications made by people wishing to move up a grade or to be fast tracked to a higher grade. Currently when a candidate applies for a promotion to a higher grade, they are applying for a grade and not a position. The use of industry 4.0 could be used to harness and develop the current talent pool using their current specialisms and experience, while also helping to build better, more diverse teams.

- Using “big data” already held and mining for the specific requirements of a new role. Using analytics to “mine information” related to existing job roles.
- Consider how job roles will evolve in the future where more technology will be present, what is needed from an individual or team will change. *“In Industry 4.0 environment, interdisciplinary cooperation and focusing on error recovery are some of important aspects that workers need to have”* (5)
- Collect “big data” from staff via their current job descriptions and mine for “matches” to new areas of work or responsibility.
- Develop “competency models” *“Organizations will need a competency model suited to assist them in their recruitment processes and attract the talent needed to develop their I4.0 capabilities”* (6)
- The organisation will need to spot trends from the private sector in terms of technology and use the data they already hold to help future proof their recruitment needs.
- The changing needs of the organisation will also mean a changing workforce, with can be further enhanced by technologies that enable “all of society” to participate. This will open up the untapped resource of, for example disabled people. Home and hybrid working is one example, due to the diminishing costs and increased availability of hardware and communication software. (7)

Conclusion

It is clear from the research undertaken; that industry 4.0 technologies are progressing at a pace unlike the previous revolutions we have seen (8).

The first process we looked at was likely to see increased efficiencies that would also have economic benefits. The human benefits in process one would possibly come later as the process developed further.

Process two had benefits from a human perspective right from the outset. It would enable Government to plan its recruitment needs into the future and give rise to models that could analyse gaps in training and resources. The models could also give rise to analysis of staff welfare at a more developed stage.

References

(1) *Article*

Towards an Autonomous Industry 4.0 Warehouse: A UAV and Blockchain-Based System for Inventory and Traceability Applications in Big Data-Driven Supply Chain Management †
Tiago M. Fernández-Caramés *, **Oscar Blanco-Novoa**, **Iván Froiz-Míguez** and **Paula Fraga-Lamas ***

Department of Computer Engineering, Faculty of Computer Science, Universidade da Coruña, 15071 A Coruña, Spain; o.blanco@udc.es (O.B.-N.); ivan.froiz@udc.es (I.F.-M.)

Received: 31 March 2019; Accepted: 22 May 2019; Published: 25 May 2019

(2) CPFR: An emerging supply chain tool

[Fliedner, Gene.](#)

[Industrial Management & Data Systems](#); [Wembley](#) [Vol. 103, Iss. 1/2,](#) (2003): 14-21.

(3) The fourth industrial revolution – Klaus Schwab (Penguin / Random House 2017) page 137

(4)Bottom-up approach based on Internet of Things for order fulfillment in a collaborative warehousing environment

[Paul J.Reaidy^a](#)[AngappaGunasekaran^b](#)[AlainSpalanzani^a](#)

Department of Supply Chain and Information Systems, University of Grenoble Alpes, CNRS, CERAG, 38040, Grenoble, France. Department of Decision and Information Sciences, University of Massachusetts, Dartmouth, 285 Old Westport Road, North Dartmouth, MA 02748-1778, USA

Received 28 April 2013, Accepted 21 February 2014, Available online 12 March 2014.

(6) M.C. Campion, D.J. Schepker, M.A. Campion, J.I. Sanchez

Competency modeling: A theoretical and empirical examination of the strategy dissemination process

Hum. Resour. Manage., 59 (3) (2020), pp. 291-306

(7) EAI Endorsed Transactions

on **Creative Technologies** Research Article

Digital Society and Economy for People with Disabilities in Industry 4.0 : Malaysia Perspectives

Ruhiyati Idayu Abu Talib^{1,2,*}, Mohd Shahrizal Sunar^{1,*}, Ruzimi Mohamed²

¹Media and Game Innovation Centre of Excellence (MaGIX), Institute of Human Centered Engineering(iHumEn),

Universiti Teknologi Malaysia(UTM), Malaysia

²School of Computing,Faculty of Engineering, Universiti Teknologi Malaysia (UTM), Malaysia

Abstract

Received on 24 January 2020; accepted on 28 January 2020; published on 04 February 2020

The first version of the paper was accepted at the INTETAIN 2019 Conference

(8) The fourth industrial revolution – Klaus Schwab (Penguin / Random House 2017)