Model managerskega sistema zgodnjega obveščanja v Industriji 4.0

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Povzetek

Raziskovalno vprašanje (RV): Nahajamo se v procesu preobrazbe poslovnih sistemov iz tradicionalnih v digitalne sisteme ter nastajajočih pametnih tovarn s kibernetsko fizičnimi sistemi (CPS). Trend se imenuje četrta industrijska revolucija (Industrija 4.0), katere značilnost je vpetost v globalno poslovno okolje s hitrimi in pogostimi tehnološkimi spremembami, kar pogosto vodi do razvojnih diskontinuitet. Sodobne tovarne morajo izkazovati višjo stopnjo zmogljivosti za prilagoditve kot v preteklosti, da se pravočasno izognejo strateškim presenečenjem. Pametne tovarne morajo biti sposobne zaznavanja opozorilnih znakov na trgu, ki so zgodnji znanilci nastajajočih strateških sprememb. Postavljata se sledeči raziskovalni vprašanji: katere zgodnje opozorilne signale mora pametna tovarna pravočasno zaznati za učinkovito upravljanje s tveganji in obrambo pred negativnimi dogodki? in 2. kako naj pametna tovarna vzpostavi svoj sistem za zgodnje zaznavanje opozorilnih znakov?
Namen: Namen raziskave je podati kritičen pogled na zastavljeno raziskovalno vprašanje. Tovarne prihodnosti, t.i. pametne tovarne potrebujejo sistem zaznavanja zgodnjih opozorilnih znakov, s katerim lahko učinkovito in pravočasno identificirajo in reagirajo na šibke opozorilne znake v njihovem poslovnem okolju. Razviti in implementirati morajo več-stopenjski sistem za zaznavanje zgodnjih opozorilnih znakov, še posebej v industrijah z visoko stopnjo tveganja. Namen študije primera je, da se preuči katere faze sistema za zaznavanje zgodnjih znakov se lahko aplicirajo za pametno tovarno, visoko inovativnega dobavitelja v avtomobilski industriji.
Metoda: Kvalitativna študija primera.
Rezultati: Na podlagi rezultatov raziskave je predlagan štiri-fazni model managerskega sistema za zaznavanje zgodnjih signalov, v katerem so opredeljene agregatne aktivnosti in potrebne managerske odločitve za vsako od štirih faz sistema. Poudarek je dan intuiciji pri sprejemanju odločitev.
Organizacija: Novi poslovni modeli so potrebni za transformacijo iz tradicionalnih sistemov v pametne sisteme v Industriji 4.0. Potrebna je večja adaptacijska kapaciteta.
Družba: Digitalizacija vpliva na vsa področja naše družbe in ima pozitivne in negativne posledice. Veča se pomen skupin interdisciplinarnih ekspertov na področju robotizacije in digitalizacije v delovanju poslovnih sistemov, kar zahteva prilagoditev programov izobraževanja in usposabljanja.
Originalnost: Tema je slabo raziskana. Študija primera je med prvimi v našem prostoru, ki preučuje sitem za zgodnje zaznavanje znakov v pametni tovarni.
Omejitve/nadaljnje raziskovanje: Majhno število pametnih tovarn v Sloveniji.

Ključne besede: Industrija 4.0, pametna tovarna, managerski sistem zgodnjega obveščanja, poslovni model, šibki signali.

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Managerial early warning system model in Industry 4.0

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Abstract

Research Question (RQ): We are witnessing a fundamental transformation of today's business systems toward digital alternatives, along with an emergence of smart factories with cyber-physical systems (CPS). This trend is called the 4th industrial revolution or shortened Industry 4.0, which is characterized by an increasingly global business environment, fast and frequent technological changes, which often lead to discontinuities in development. Today's factories need to have a higher capacity for adaptation than in the past, in order to timely adjust and avoid strategic surprises. Management has to be capable of sensing warning signs on the market, which are early indicators of impending impactful events. Therefore, the following questions occur: 1. what early warning system do smart factories need to manage risks more effectively and prevent negative events? 2: how can smart factories build their early warning systems?
Purpose: The purpose of the study is to give a critical view of our research questions. Factories of the future, i.e. smart factories need to develop effective early warning systems to indentify and respond to weak signals in order to adapt to an ever-changing environment. They need to develop and implement several-stage early warning systems that are specific to the industry, especially if it is a high-risk industry. The aim of the study is to examine which stages of an early warning system apply for the case of an innovative supplier in the automotive industry.
Method: A qualitative case study design is used.
Results: Four-stage managerial early warning system model based on a case study is proposed. Aggregate activities and management decisions are defined for each stage. The importance of intuition is taken into consideration.
Organization: New disruptive business models are evolving around the Industry 4.0 and factories need enhanced adaptation capacity.
Society: Digitalization is influencing each segment of our society and has both positive and negative consequences. Increasing importance is given to employing interdisciplinary experts in the field of robotization and digitalization, which is forcing factories to change their business models and employee training programs.
Originality: Literature on our research topic is scarce, despite its importance for existing and developing smart factories in Slovenia. To the best of our knowledge, we are one of the first to do a case study on the topic of managerial early warning system within the context of a smart factory.
Limitations / further research: The limitation of our study is that there is a limited number of smart factories in Slovenia.

Keywords: Industry 4.0, smart factory, managerial early warning system, business model, weak signs.

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