



[Desk Research, Report Structure, & Reference management]

[George Xydis]



Funded by
the European Union



University
of Cyprus



UNIVERSITÀ
DEGLI STUDI
FIRENZE



AGENDA

- The role of desk research in your reports
- How to find papers
- Reference Management Systems

WHAT IS DESK RESEARCH?

DESK RESEARCH

Or *Secondary research*

- In short, it refers to the collection of secondary data, data already collected and the usage of existing information (even published in some form or other)

Opposed to *primary research*

LITERATURE REVIEW

It is a systematic, explicit, and reproducible method for synthesizing and evaluating the existing body of recorded work produced by researchers, scholars, and practitioners in a specific field.

It focuses on high quality original research

Literature
review

Theoretical
section

Theory

Section

THE ROLE OF DESK RESEARCH IN YOUR REPORTS

WHY IS THIS IS IMPORTANT TO YOU?

Company Project

- › Formulate a well-defined problem and argue for the relevance and usefulness of this problem formulation.
- › Identify relevant literature, describe the essence of it, argue for its relevance and reflect on its strengths and weaknesses in relation to the problem formulation.
- › Identify and apply relevant empirical and/or analytical methods and explain their relevance and limitations for the problem formulation.

Master's Thesis

engineering practices, and similar.

- › The ability to create a strong link between the choice of subject and the scientific methodology and choice and criticism of theory/models, leading to an adapted theory/model.
- › The ability to select, evaluate and adapt theory to the present task.
- › The ability to collect new theory independently.
- › The ability to apply the methodology extensively in terms of problem identification and information gathering.
- › The ability to process substantial amounts of externally retrieved data and networking performed by the use of the internet, scientific articles, expert interviews, focus group interviews, observations, experiments, statistical data or other sources.

THE ROLE OF DESK RESEARCH IN YOUR REPORTS

Robustness

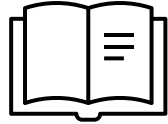
What has already been done?

How has others done this before?

Identify gaps – Novelty is nice and publishable, and usually make very good reports and grades.

HOW TO FIND PAPERS

BOOKS VS PAPERS



Broader/general knowledge

Evaluated by experts/editors

Longer (200-300 pages)

Good for “basic knowledge”

- LEAN ground principles
- How to get started with Python
- Operations Management

“Time to market”: Years



Narrow/specific knowledge

Evaluated by peers

Shorter (5-30 pages)

Novelty – newest research

“How to use a LSTM algorithm to predict stock prices”

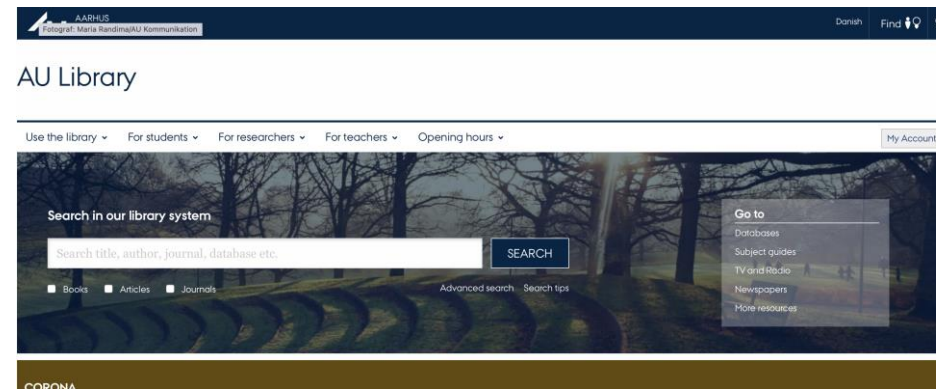
”The exponential development of COVID19”

“Edge computing in IoT devices – five case studies from the industry”

“Time to market”: Months

WHERE TO FIND PAPERS

Libraries



→ + a lot more



Scopus®





DEPARTMENT OF BUSINESS DEVELOPMENT
AND TECHNOLOGY
AARHUS UNIVERSITY









SEARCHING FOR: SME DIGITALIZATION

Did you intend to search for: [soes digitalization](#)?

☐ 0 selected **PAGE 1** 4,786 Results ☐ Personalize

1  **ARTICLE** **Spanish SMEs' digitalization enablers: E-Receipt applications to the offline retail market**
Gavrila Gavrilă, Sorin ; de Lucas Ancillo, Antonio
Technological forecasting & social change, 2021-01, Vol.162, p.120381-120381
“ •Existence of certain accelerators can generate new business opportunities. •Necessity of SMEs digitalization struggling to satisfy customers... ”
 **PEER REVIEWED JOURNAL**
[Check availability](#) >

2  **OTHER** **Digitalization in the value chain - An exploratory study of Danish SME's**
Ulrik Kragh; Lars Grubbe Dietrichson; Aarhus University ; Aarhus BSS; Department of Economics and Business Economics
2019
 **PEER REVIEWED JOURNAL**  **OPEN ACCESS**
[Available Online](#) >

3  **ARTICLE** **Modeling University Business Incubator For SMEs Digitalisation**
Huda, Nisrina Nafi'atul ; Rejito, Cattleya
Indonesian Journal of Information Systems, 2020-08-27, Vol.3 (1), p.23-37
“ The emergence of changes in various aspects of human life due to the global pandemic COVID-19 not only affects large or multi-national companies, but it also has several impacts on SMEs... ”
 **PEER REVIEWED JOURNAL**  **OPEN ACCESS**

SEARCHING FOR: SME DIGITALIZATION

Brought to you by Aarhus Universitets Biblioteker / Aarhus University Libraries



Scopus

Welcome to a more intuitive and efficient search experience. [See what is new](#)

Advanced query ☐

Search within
Article title, Abstract, Keywords

Search documents *
sme AND digitalization

Save search

Set search alert

+ Add search field

Reset

Search

Beta

DocumentsPreprintsPatentsSecondary documentsResearch data

571 documents found

Analyze results

Refine search

AllExportDownloadCitation overviewMore

Show all abstractsSort byDate (newest)

Search within results

Filters

Open access

	Document title	Authors	Source	Year	Citations
<input type="checkbox"/> 1	Article • Open access Digital platforms' use in SMEs—A critical analysis of entrepreneurs' behaviour	<u>Nayak, M., Nayak, P.M., Joshi, H.G.</u>	<u>Cogent Economics and Finance</u> , 13(1), 2461337	2025	0
	Show abstract	KB link	Related documents		



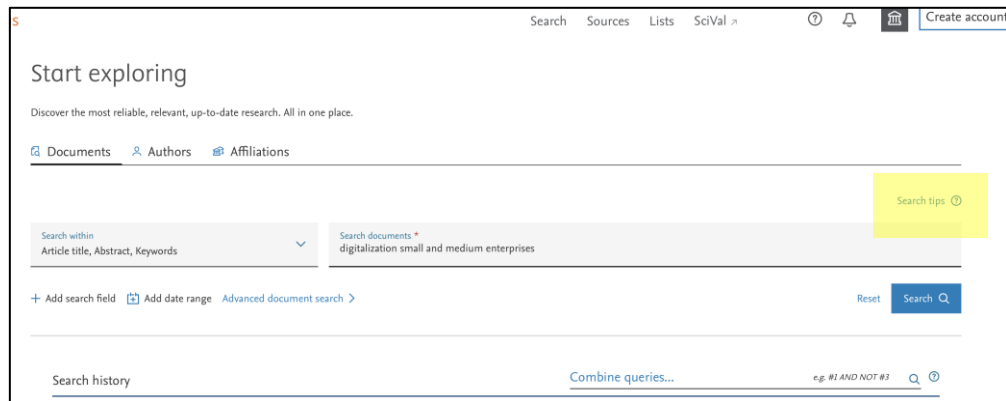
DEPARTMENT OF BUSINESS DEVELOPMENT
AND TECHNOLOGY
AARHUS UNIVERSITY



DELIMITING YOUR SEARCH

Advanced search:

- Pick some keywords
- Search in title, keywords, abstract etc.
- Think about variation
- Look up the search operators in the search bases



Boolean operators and phrase search

- Boolean operators currently supported include AND, OR, NOT, and the hyphen (or minus symbol)
- Boolean operators must be entered in all uppercase
- The hyphen (or minus symbol) is interpreted as the NOT operator
 - Example: **black -hole** will return results containing 'black', but exclude any instances where 'hole' appears with it.
- Boolean precedence is as follows:
 1. NOT
 2. AND
 3. OR
- Parentheses can be used when nesting clauses so the grouping is clear and unambiguous
 - Example: Instead of searching **a OR b AND c OR d**
Please use **(a OR b) AND (c OR d)**
- Quotation marks can be used to specify terms which must appear next to each other
 - Example: **("heart attack" OR "myocardial infarction") AND diabetes AND NOT cancer**
 - The above example can be expressed more concisely as: **("heart attack" OR "myocardial infarction") diabetes -cancer**

Rules

- Punctuation is ignored in a phrase search. The searches **"heart-attack"** and **"heart attack"** return the same results.
- Plurals and spelling variants are included: **"heart attack"** includes **"heart attacks"**, **"color code"** includes **"colour code"**

SEARCHING FOR: ("SME" OR "SMES" OR "SMALL AND MEDIUM ENTERPRISES") AND ("DIGITALIZATION")

Did you intend to search for: "SME" OR "soes" OR "small and medium enterprise*" AND ("digitalization")?

0 selected PAGE 1 37 Results Personalize

1 OTHER

Digitalization in the value chain - An exploratory study of Danish SME's
Ulrik Kragh; Lars Grubbe Dietrichson; Aarhus University ; Aarhus BSS; Department of Economics and Business Economics
2019
PEER REVIEWED JOURNAL OPEN ACCESS
Available Online >

2 ARTICLE

Modeling University Business Incubator For SMEs Digitalisation
Huda, Nisrina Nafi'atul ; Rejito, Cattleya
Indonesian Journal of Information Systems, 2020-08-27, Vol.3 (1), p.23-37
The emergence of changes in various aspects of human life due to the global pandemic COVID-19 not only affects large or multi-national companies, but it also...
PEER REVIEWED JOURNAL OPEN ACCESS
Check availability >

3 ARTICLE

Planning for Digitalisation in SMEs using Tools of the Digital Factory
Stoldt, Johannes ; Trapp, Thies Uwe ; Toussaint, Stefan ; Süße, Marian ; Schlegel, Andreas ; Putz, Matthias
Procedia CIRP, 2018, Vol.72, p.179-184
Digitalisation offers ways as well as means for manufacturers to adapt their production systems to handle diversifying and rapidly changing market demands....
PEER REVIEWED JOURNAL OPEN ACCESS
Check availability >

PAGE 1

NO FILTERING

7,726 results

Set search alert

Refine by:

☐ Subscribed journals

Years

☐ 2021 (291)

☐ 2020 (999)

☐ 2019 (781)

Show more

Article type

☐ Review articles (303)

☐ Research articles (5,621)

☐ Encyclopedia (60)

☐ Book chapters (618)

Show more

Publication title

☐ Procedia Manufacturing (409)

☐ Procedia CIRP (361)

☐ Technological Forecasting and Social Change (210)

☐ Download selected articles [Export](#)

☐ Research article Full text access

Spanish **SMEs'** digitalization enablers: E-Receipt applications to the offline retail market

Technological Forecasting and Social Change, 15 October 2020, ...

Sorin Gavrilă Gavrilă, Antonio de Lucas Ancillo

Download PDF [Abstract](#) [Extracts](#) [Export](#)

☐ Research article Full text access

Digital transformation and customer value creation in Made in Italy **SMEs**: A dynamic capabilities perspective

Journal of Business Research, 21 October 2020, ...

Michela Matarazzo, Lara Penco, ... Roberto Quaglia

Download PDF [Abstract](#) [Extracts](#) [Export](#)

Get a personalized search experience

Recommendations, reading history, search & journals alerts, and [more](#).

[Personalize](#)

☐ Research article Full text access

SMEs and Industry 4.0: Two case studies of digitalization for a smoother integration

Computers in Industry, 8 December 2020, ...

Afonso Amaral, Paulo Peças

Download PDF [Abstract](#) [Extracts](#) [Export](#)

☐ Research article Full text access

The duality of digital and environmental orientations in the context of **SMEs**: Implications for innovation performance

WITH FILTERING

31 results

Set search alert

Refine by:

☐ Subscribed journals

Years

☐ 2021 (4)

☐ 2020 (12)

☐ 2019 (9)

Show more ▾

Article type [?]

☐ Review articles (1)

☐ Research articles (30)

Publication title

☐ Procedia CIRP (5)

☐ Journal of Business Research (4)

☐ Procedia Manufacturing (4)

Show more ▾

☐ Download selected articles [Export](#)

☐ **Research article** ● Full text access

The use of **digital** technologies by **small** and **medium enterprises** during COVID-19: Implications for theory and practice

International Journal of Information Management, 1 July 2020, ...

Thanos Papadopoulos, Konstantinos N. Baltas, Maria Elisavet Balta

Download PDF Abstract ▾ Export ▾

☐ **Research article** ● Open access

Is a **digital** transformation framework enough for manufacturing smart products? The case of **Small** and **Medium Enterprises**

Procedia Manufacturing, 6 April 2020, ...

Melissa Liborio Zapata, Lamia Berrah, Laurent Tabourot

Download PDF Abstract ▾ Export ▾

Get a personalized search experience

Recommendations, reading history, search & journals alerts, and [more](#).

[Personalize >](#)

☐ **Research article** ● Open access

Planning for **Digitalisation** in **SMEs** using Tools of the **Digital** Factory

Procedia CIRP, 27 June 2018, ...

Johannes Stoldt, Thies Uwe Trapp, ... Matthias Putz

Download PDF Abstract ▾ Export ▾

sorted by [relevance](#) | [date](#)

GOOGLE SCHOLAR

Scholar is not a database – it's a search engine

“Super biased”

Links to databases anyway

Wierd papers – arXiv.org

SME digitalisation

About 8.020 results (0,04 sec)

[PDF] **SMEs and digitalisation: The current position, recent developments and challenges** [PDF] kfw.de
V Zimmermann - KfW research, 2016 - kfw.de
The extent of **digitalisation** in **SMEs** is not nearly as great as might be expected, given the level of public debate about the issue. Around a third of German **SMEs** are still in the early stages of **digitalisation**. Pioneers—companies that already rely on digital products and ...
☆ 99 Cited by 7 Related articles All 4 versions

[PDF] **Digitalisation, ecosystems, entrepreneurship and policy** [PDF] researchgate.net
E Autio - Perspectives into topical issues is society and ways to ..., 2017 - researchgate.net
... ecosystems to 'digital start-ups' alone, but consider the effects of **digitalisation** on all **SMEs** and small businesses. With specific ref- erence to more traditional **SMEs**, two policy priorities therefore arise: (1) facilitating the rein- vention of established **SME** business models through ...
☆ 99 Cited by 34 Related articles

Planning for **digitalisation** in **SMEs** using tools of the digital factory [PDF] sciencedirect.com
J Stoldt, TU Trapp, S Toussaint, M Süße, A Schlegel... - Procedia CIRP, 2018 - Elsevier
Digitalisation offers ways as well as means for manufacturers to adapt their production systems to handle diversifying and rapidly changing market demands. Yet, small and medium sized enterprises are often overwhelmed by the speed of development of ICT ...
☆ 99 Cited by 12 Related articles

Conceptualising a digital orientation: antecedents of supporting **SME** performance in the digital economy [PDF] tandfonline.com
S Quinton, A Canhoto, S Molinillo, R Pera... - Journal of Strategic ..., 2018 - Taylor & Francis
... the proposed model of DO mirrors the activity and practice of **SMEs** which require ... without specialist silos and as such, provides a realistic contribution for **SME** strategy development ... the unique contribution of a conceptual model specific to the context of **digitalisation**, and provide ...
☆ 99 Cited by 50 Related articles All 8 versions

sme digitalisation

Ca. 18.800 resultater (0,06 sek.)

[PDF] **SMEs and digitalisation: The current position, recent developments and challenges** [PDF] kfw.de
V Zimmermann - KfW research, 2016 - kfw.de
The extent of **digitalisation** in **SMEs** is not nearly as great as might be expected, given the level of public debate about the issue. Around a third of German **SMEs** are still in the early stages of **digitalisation**. Pioneers—companies that already rely on digital products and ...
☆ 99 Citeret af 7 Relaterede artikler Alle 4 versioner

[PDF] **Digitalisation, ecosystems, entrepreneurship and policy** [PDF] researchgate.net
E Autio - Perspectives into topical issues is society and ways to ..., 2017 - researchgate.net
... Page 8. **DIGITALISATION, ECOSYSTEMS, ENTREPRENEURSHIP AND POLICY** 8 20/2017 Table
1 Policy actions to support the **digitalisation** of existing **SMEs**' business models Interaction category
Digitalisation opportunities **SME**'s internal activity system Overall ...
☆ 99 Citeret af 34 Relaterede artikler

Firm performance among internationalized **SMEs**: The interplay of market orientation, marketing capability and **digitalization** [PDF] mdpi.com
S Joensuu-Salo, K Sorama, A Viljamaa... - Administrative ..., 2018 - mdpi.com
The ability to internationalize has become a competitive necessity for many firms, and one important for survival and growth in the era of globalization. At the same time, **digitalization** is transforming the locus of entrepreneurial opportunities and entrepreneurial practices, thus ...
☆ 99 Citeret af 40 Relaterede artikler Alle 11 versioner

[HTML] The usage of digital marketing channels in **SMEs** [HTML] emerald.com
HM Taiminen, H Karjalainen - Journal of Small Business and ..., 2015 - emerald.com
... Literature argues that traditional marketing theories are not even applicable to **SMEs** (Reijonen, 2010). **SME** marketing techniques are informal, reactive and spontaneous (Gilmore et al., 2004), and there is a considerable gap between marketing activity in a typical **SME** and the ...
☆ 99 Citeret af 242 Relaterede artikler Alle 4 versioner

CRITERIA TO LOOK FOR

Up-to-date / New

Peer-reviewed

Comprehensive

Ranking

GOOD OR BAD PAPER?

Hybrid Approach to Automation, RPA and Machine Learning: a Method for the Human-centered Design of Software Robots

Wiesław Kopeć
Kinga Skorupska
Piotr Gago
Krzysztof Marasek
Polish-Japanese Academy
of Information Technology
Warsaw, Poland
{kopeć,kinga.skorupska,
pgago,kmarasek}@pja.edu.pl

Marcin Skibiński
DPC Polska
Warsaw, Poland
m.skibinski@dpcpolska.pl

Dominika Tkaczyk
University of Warsaw, ICM
Warsaw, Poland
d.tkaczyk@uw.edu.pl

Cezary Biele
Katarzyna Abramczuk
National Information Processing
Institute
Warsaw, Poland
{cezary.biele,
katarzyna.abramczuk@opi.org.pl}

Anna Jaskulska
Kobo Association
Warsaw, Poland
a.jaskulska@kobo.org.pl

Abstract

One of the more prominent trends within Industry 4.0 is the drive to employ Robotic Process Automation (RPA), especially as one of the elements of the Lean approach. The full implementation of RPA is riddled with challenges relating both to the reality of everyday business operations, from SMEs to SSCs and beyond, and the social effects of the changing job market. To successfully address these points there is a need to develop a solution that would adjust to the existing business operations and at the same time lower the negative social impact of the automation process.

To achieve these goals we propose a hybrid, human-centered approach to the development of software robots. This design and implementation method combines the Living Lab approach with empowerment through participatory design to kick-start the co-development and co-maintenance of hybrid software robots which, supported by variety of AI methods and tools, including interactive and collaborative ML in the cloud, transform menial job posts into higher-skilled positions, allowing former employees to stay on as robot co-designers and maintainers, i.e. as co-programmers who supervise the machine learning processes with the use of tailored high-level RPA Domain Specific Languages (DSLs) to adjust the functioning of the robots and maintain operational flexibility.

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the owner/author(s).
CSCW'18 Workshop on Industrial Internet of Things, Jersey City, New Jersey, USA

THE MORE CITED THE MORE POPULAR?

Documents Secondary documents Patents [View Mendeley Data \(29\)](#)

Analyze search results [Show all abstracts](#) Sort on: [Cited by \(highest\)](#)

☐ All [Export](#) [Download](#) [View citation overview](#) [View cited by](#) [Save to list](#) [...](#) [Print](#) [Email](#) [Save](#)

	Document title	Authors	Year	Source	Cited by
<input type="checkbox"/> 1	A Cyber-Physical Systems architecture for Industry 4.0-based manufacturing systems	Lee, J., Bagheri, B., Kao, H.-A.	2015	Manufacturing Letters 3, pp. 18-23	1845
	View abstract KB link Related documents				
<input type="checkbox"/> 2	Intelligent Manufacturing in the Context of Industry 4.0: A Review <i>Open Access</i>	Zhong, R.Y., Xu, X., Klotz, E., Newman, S.T.	2017	Engineering 3(5), pp. 616-630	639
	View abstract KB link Related documents				
<input type="checkbox"/> 3	Industry 4.0: State of the art and future trends	Xu, L.D., Xu, E.L., Li, L.	2018	International Journal of Production Research 56(8), pp. 2941-2962	546
	View abstract KB link Related documents				
<input type="checkbox"/> 4	Past, present and future of Industry 4.0 - a systematic literature review and research agenda proposal	Liao, Y., Deschamps, F., Loures, E.F.R., Ramos, L.F.P.	2017	International Journal of Production Research 55(12), pp. 3609-3629	527

USEFUL TIPS

- First read the title and publication date
- Study the contents (headings and subsection headings).
- Examine the review. Familiarise yourself with the structure.
- Read the abstract and the Introduction (which is a synopsis of the layout)
- Interrogate – ask questions. Is this resource mainly theoretical? Is it conceptual or does it present the results of an empirical study? Many articles will contain some or all of these.
- Check for your own keywords in the index.
- Check the Bibliography or the Reference list. Do you recognise some of the authors and texts cited? If not, maybe you have just started to work with the topic.

FIND AN AUTHOR

Ford, H. 1922. *My Life and Work*. Garden City, NY: Country Life Press.

Frey, C., and M. Osborne. 2013. The future of employment: How susceptible are jobs to computerization? *Technological Forecasting & Social Change*. doi: [org/10.1016/j.techfore.2016.08.019](https://doi.org/10.1016/j.techfore.2016.08.019)

Hindle, J., M. Lacity, L. Willcocks, and S. Khan. 2018. *Robotic Process Automation: Benchmarking the Client Experience*. Charleston, SC: Knowledge Capital Partners.

Institute for RPA. 2015. *Introduction to Robotic Process Automation: A Primer*. New York, NY: The Institute for RPA.

IEEE Corporate Advisory Group. 2017. *IEEE Guide for Terms and Concepts in Intelligent Process Automation*. New York, NY: IEEE.

International Auditing and Assurance Standards Board (IAASB). 2016. *Exploring the Growing Use of Technology in the Audit, with a Focus on Data Analytics*. New York, NY: IFAC.

Issa, H., and A. Kogan. 2014. A predictive ordered logistic regression model as a tool for quality review of control risk assessments. *Journal of Information Systems* 28 (2): 209–229. <https://doi.org/10.2308/isys-50808>

Issa, H., T. Sun, and M. A. Vasarhelyi. 2016. Research ideas for artificial intelligence in auditing: The formalization of audit and

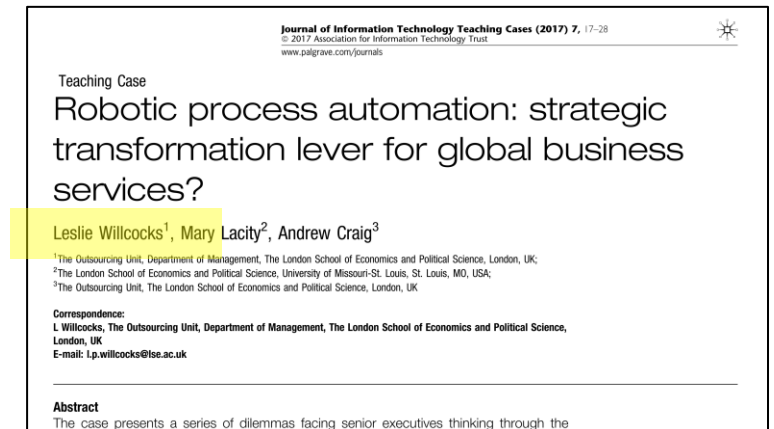
Kristina Romero (December 15, 2017). Content Enabled Robotic Process Automation and Analytics. Accessed from <https://infocapnet.com/robotic-process-automation/> on 23/7/2018.

Lacity, M., Willcocks, L. P., & Craig, A. (2015). Robotic process automation at Telefonica O2.

Lacity, M. C., & Willcocks, L. P. (2016). A new approach to automating services. MIT Sloan Management Review, 58(1), 41.

Linner, T., Pan, W., Georgoulas, C., Georgescu, B., Güttler, J., & Bock, T. (2014). Co-adaptation of robot systems, processes and in-house environments for professional care assistance in an ageing society.

a still somewhat handmade audit process into a more assembly-line audit process. RPA represents a dramatic and disruptive change in current audit practice that promises to allow auditors to operate at a much higher level. Leslie Willcocks, a professor at the London School of Economics, has defined RPA as “a type of software that mimics the activity of a human being in carrying out a task within a process. It can do repetitive stuff more quickly, accurately, and tirelessly than humans, freeing them to do other tasks” (Xavier Luber, “The Next



The IT Function and Robotic Process Automation

Professor Leslie Willcocks

The Outsourcing Unit
Department of Management

The London School of Economics and Political Science
l.p.willcocks@lse.ac.uk

Professor Mary Lacity

Curators' Professor, University of Missouri-St. Louis

FIND LITERATURE REVIEWS

Integration of continuous improvement strategies with Industry 4.0: a systematic review and agenda for further research

S. Vinodh

Department of Production Engineering,
National Institute of Technology Tiruchirappalli, Tiruchirappalli, India

Jiju Antony

Logistics and Operations Group, School of Social Sciences, Heriot Watt University

CI strategies
with Industry
4.0

Received 12 July 2020
Revised 29 July 2020
Accepted 29 July 2020

Author	Study	Proposed framework	Applications	Advantages	Disadvantages
Li <i>et al.</i> (2016)	Framework integrating Industry 4.0 tools with predictive maintenance activity proposed	Remote prognostics and monitoring system along with RFID techniques and data signal sensors	To monitor the health of any machinery so as to reduce future failure cost. Integration of RFID techniques and data signal sensors to collect data for detecting fault components	The main advantage of the developed model is that it helps in monitoring the health of any machinery to reduce future failure cost. RFID sensors have been installed which can identify faulty components	The developed framework can be applicable only on maintenance activity to know the condition of machine. They have not included solution providing techniques for detected faults
Marhaug and Schjolberg (2016)	Framework for intelligent predictive maintenance proposed	Includes Industry 4.0 tools CPS IoT IoT Data Mining	CPS is used for managing interconnection between physical resources and computational capabilities. They used data mining technique for extracting data from different physical resources using IoT and IoT	The developed framework helped the engineers to monitor the machine conditions. Intelligent alert of framework helped in identifying process or machinery-related issues and provides the probable root cause	The developed framework is meant for management of maintenance activities of subsea production systems. However, it can be further expanded to other industries
Rauch <i>et al.</i> (2016)	Framework consisting of Industry 4.0	Different Industry 4.0 techniques for	The developed model is helpful in eliminating	Represented in graphical form, it includes the	The presented framework integrated only

CI strategies
with Industry
4.0

Need for Industry 4.0

A company must produce high-quality product to satisfy customer demands and to sustain in competitive market. This can be achieved with the promising technology of Industry 4.0. Industry 4.0 tools like CPS, IoT helps a firm to enhance productivity and quality of products

By deploying new Industry 4.0 techniques such as CPS, the application of an industry can be enhanced by extending existing lean system to different production systems. CPS technologies are the most promising tool for making an industry more agile

Smart maintenance is needed to improve the maintenance strategy, to attain high level of safety and to increase profit in maintenance of production system. Maintenance management can be more effectively done with the use of CPS, IoT and big data

Industry 4.0 have the potential to enhance flexibility and efficiency of the production line by using intelligent system to contribute toward long-term growth and future expansion and enhance competitiveness

Industry 4.0 tools helps in enhancing productivity and adding value to the product through smart products, smart machinery and smart operator

LSS amalgamation with Industry 4.0 has a scope to develop highly optimized ideal defect free and minimum wastage process flow

Industry 4.0 is needed because it uses dynamic behavior of systems for calculating system reliability whereas existing methods use empirical data for reliability calculation

Today the production system is becoming more multidisciplinary and highly agile which is crucial for competitiveness of smart product. So, there exists a need for a smart approach that uses new ICT technologies

Existing industries facing numerous challenges for mass customization which can be solved by Industry 4.0 utilization. Industry 4.0 can make industry smart and enhance mass customization

Digitalization of the shop floor is an essential requirement to connect the top-level management with the shop floor. This can be achieved with the application of communication technologies like IoT, IoT and CPS. Globalization of the market involves sustainable dimensions like social, economic and environmental aspect. To meet the sustainability aspect, development of Industry 4.0 is required

Source

Foidl and Felderer (2015), Tamás *et al.* (2016), Tortorella and Fettermann (2018), Kim (2017), Zúñiga *et al.* (2017)

Kolberg and Zühlke (2015), Wagner *et al.* (2017), Arcidiacono and Pieroni (2018)

Chukwueke *et al.* (2016), Marhaug and Schjolberg (2016), Sipsas *et al.* (2016)

Gabriel and Pessl (2016), Li *et al.* (2016), Martinez *et al.* (2016), Sauter *et al.* (2016)

Gerlitz (2016), Mrugalska and Wyrwicka (2017)

Jayaram (2016)

Jazdi (2016)

Rauch *et al.* (2016), Kim (2017)

Sanders *et al.* (2016), Saldivar *et al.* (2016), de Man and Strandhagen (2017), Tamás and Illés (2016)

Zarte *et al.* (2016), Stock and Seliger (2016)

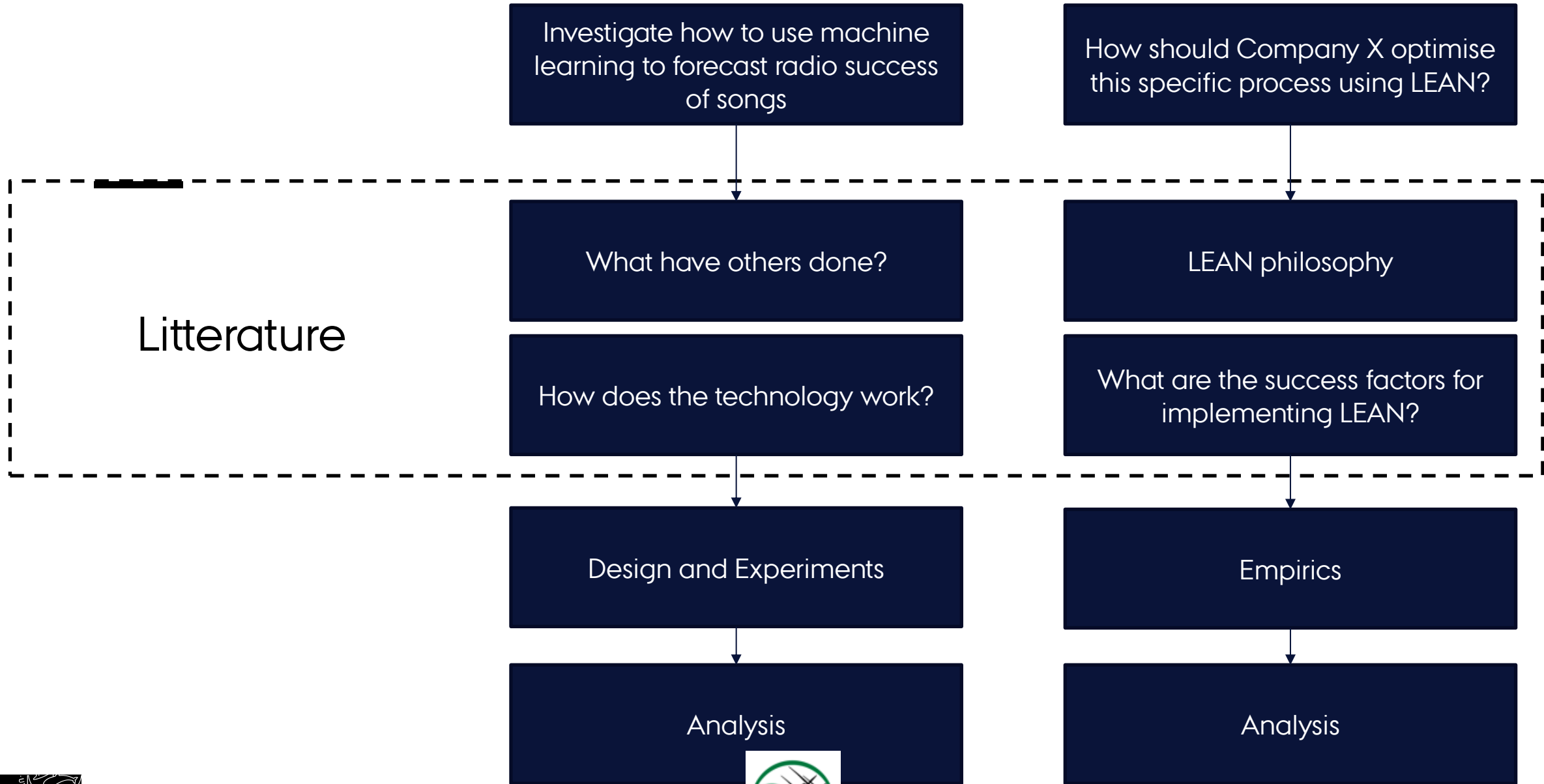
WHEN TO STOP?

When your search is **no longer fruitful**, and you are not getting any new or relevant studies, review what you've already collected.

- You find the same things over and over again

TRIANGULATION

Since the introduction in 2011, Industry 4.0 (I4.0) has promised to '*provide more value oriented and customer-centric products and services with a higher degree of efficiency*' [1], which would be possible through IT-integrations between planning, production, customers and vendors [2], [3]. It is hard to define what this actually means and several definitions exists [4], [5], put succinctly, the concept of I4.0 describes the increasing digitalisation of the entire supply chain by integrating innovation and technologies with various devices and machinery to create intelligent factories and processes [1], [5], [6]. High quality data, efficient data flows and data technologies now become necessities to remain competitive, as more and more product offerings and enterprise solutions, are built around data. It seems that it is imperative for companies to collect, structure and utilise data in their daily operations, as this will be the future prerequisite for delivering on customer expectations and operational efficiency (OE) [3], [5], [7]–[9]. However, research has shown that companies are far away from intelligent and fully connected processes and machinery [10], [11], and this is especially the case for small to medium enterprises (SMEs) [3], [9], [10], [12], [13].



SUM IT UP

Case	Model	Reference
Energy consumption forecasting, Predictive maintenance, Stock prediction	LSTM / GRU	(Amihai et al., 2018; J. Chen et al., 2018; Li et al., 2019; Parmar et al., 2018; Wang et al., 2019; Yan & Ouyang, 2018)
Energy consumption forecasting, Predictive maintenance, Stock prediction, PLC prediction	SVR	(Carvalho et al., 2019; J. Chen et al., 2018; Dhanaraj & Logan, 2005; Fan & Casey, 2013; Gohel et al., 2020; Herremans et al., 2014; Jennings et al., 2016; Li et al., 2019; Moura et al., 2011; Parmezan et al., 2019; Usmani et al., 2016)
Energy consumption forecasting,	CNN	(Wang et al., 2019)
Energy consumption forecasting, Predictive maintenance, Stock prediction	ARIMA	(Baptista et al., 2018; Hernández et al., 2014; Kanawaday & Sane, 2017; Li et al., 2019; Parmezan et al., 2019; Usmani et al., 2016; Wang et al., 2019)
Energy consumption forecasting, Predictive maintenance, Stock prediction, PLC prediction	MLP	(Baptista et al., 2018; Billah et al., 2017; Carvalho et al., 2019; Hernández et al., 2014; Jennings et al., 2016; Moura et al., 2011; Parmezan et al., 2019; Usmani et al., 2016)
Predictive maintenance	KNN	(Baptista et al., 2018; Carvalho et al., 2019; Li et al., 2019; Parmezan et al., 2019)
Predictive maintenance, Stock prediction, PLC prediction	RF / Decision tree	(Baptista et al., 2018; Jennings et al., 2016; Kaparathi & Bumblauskas, 2020; Kulkarni et al., 2018; Middlebrook & Sheik, 2019; Sadia et al., 2019)
Predictive maintenance, Predictive maintenance	K-means clustering	(Amihai et al., 2018; Baptista et al., 2018; Carvalho et al., 2019)

REPORT STRUCTURE

REFERENCE MANAGEMENT SYSTEMS



DEPARTMENT OF BUSINESS DEVELOPMENT
AND TECHNOLOGY
AARHUS UNIVERSITY



WHAT IS A GOOD REFERENCE?



Correct



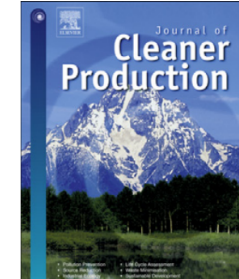
Traceable



Contents lists available at ScienceDirect

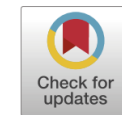
Journal of Cleaner Production

journal homepage: www.elsevier.com/locate/jclepro



Review

Are QM models aligned with Industry 4.0? A perspective on current practices



Muhammad Asif

College of Business Administration, Prince Sultan University, Saudi Arabia

ARTICLE INFO

Article history:

Received 8 November 2018

Received in revised form

29 July 2019

Accepted 27 February 2020

Available online 29 February 2020

Handling editor: Tomas B. Ramos

ABSTRACT

The latest technological developments epitomized in Industry 4.0 have created a disruptive effect on the production/service systems and value chains. Industry 4.0, building on the integration of information and communication technologies, Internet of things, robotics, additive manufacturing, and artificial intelligence, aims for developing autonomous and dynamic operations to enable the mass production of highly customized products. Industry 4.0 and quality management share the same objective, that is, improving process performance, yet through different trajectories. However, notwithstanding Industry 4.0 developments, quality management models have remained stagnant and failed to keep abreast of these advancements. This paper evaluates the alignment of quality management models with Industry 4.0. The paper shows that quality models are not congruent with Industry 4.0. The former build on the paradigm

7.	Conclusions	9
8.	Limitations and future research directions	9
	References	9

1. Introduction

Quality of a product or service is viewed as a sustainable source of competitive advantage (Cf. brand image, prestige, and product

E-mail address: masif@psu.edu.sa.

<https://doi.org/10.1016/j.jclepro.2020.120820>

0950-4230/© 2020 Elsevier Ltd. All rights reserved.



WHAT IS A REFERENCE MANAGEMENT SYSTEM

- Centralises all your references outside of Word
- Integrates with Word to easily put in references
- Some has DOI integration
- Some has a built-in PDF reader



MENDELEY

Pros:

- DOI integration
- Word integration
- PDF reader
- Group collaboration

Cons:

- Sometimes a bit buggy (Mac)
- No Google Docs support :(





**DEPARTMENT OF BUSINESS DEVELOPMENT
AND TECHNOLOGY**
AARHUS UNIVERSITY