

The Implementation Path of Digital Intelligent Transformation in Enterprise Human Resource Management in the Era of VUCA

Pei Dongqiao

*School of Economics and Management, Guangxi Normal University, Guilin, China
13075590459@163.com*

Abstract: *In the complex and changing VUCA era, the traditional human resource management model is facing challenges, and enterprise human resource management is in urgent need of innovation and transformation. With the rapid development of digital technologies such as big data and artificial intelligence and their extensive empowerment in various industries, enterprise human resource management is transforming into digital intelligence. However, the transformation of enterprise human resource management into digital intelligence is faced with the lack of the concept of digital intelligence human resource management, backward management style, lack of special technical and financial support, the digital intelligence platform is not widely used, the information of the departmental organisation is not good, and the coordination of the digital intelligence transformation is difficult. In order to overcome the transformation obstacles, enterprises should achieve digital intelligent transformation in the path of selecting, employing, educating and motivating people, in order to improve organisational resilience to face the risks and challenges of the VUCA era and to achieve sustainable development of corporate strategy.*

Keywords: *VUCA era; digital intelligence; human resource management*

1. Introduction

Human resource management is closely related to the development and change of social and economic environment and practice needs.^[1] In the VUCA era of variability, uncertainty, complexity (and ambiguity), the traditional HRM model is facing great challenges.^[2] The traditional human resource management model is facing a great challenge. 2020, the sudden emergence of the new Crown Pneumonia epidemic has disrupted the normal rhythm of people's work and life, and many enterprises are facing a severe test. Facing the challenges of the VUCA era, traditional human resource management has dilemmas and is in urgent need of transformation and innovation. Digital intelligence is different from digitalisation, which is a product of the integration of digital information and digital intelligence technologies such as cloud computing, artificial intelligence, big data and regional chains, and its essence is to realise the intelligence of "digitalization" through artificial intelligence. Digital intelligence has not only shaped a new form of global economy, but also provided powerful technical support for the transformation and upgrading of traditional industries, prompting mankind to move towards a "digital society". At present, China is continuously building information infrastructure, convergence infrastructure and innovation infrastructure to facilitate the implementation of artificial intelligence and to start the mission of coping with the VUCA era.

In the VUCA era, in the field of human resource management, variability refers to the changes in the human resource environment and the increase in the frequency of talent turnover, which makes the "battle for manpower" more and more challenging for organisations.^[3] Uncertainty refers to the uncertainty in the acquisition of human resources. Uncertainty refers to the high degree of uncertainty in the acquisition of human resources, including changes in digital talent standards, business needs and the environment. Complexity refers to the fact that the HRM environment has become particularly complex, and that HR in today's environment is influenced by politics, economics, technology, culture and values. Ambiguity refers to the vagueness of digital intelligence transformation, which cannot succeed if digital intelligence technologies are not ultimately translated into efficiency and results that permeate HR work and business. Therefore, relying on digital intelligence, the deep integration of various high-tech and economic productivity has changed the thinking, processes and means of enterprise human resources management, which is transforming towards digital intelligence.

2. Challenges to traditional human resource management in the VUCA era

2.1. Accelerated pace of organisational change

In the VUCA era, the environment in which organizations operate is complex and changing, the risks they face have increased, and organizations need to accelerate the pace and intensity of change in order to grow better. In the traditional human resource management model, the duties of the human resource management department are divided into six modules, such as recruitment, selection, training, compensation, etc., and each module has a dedicated staff in charge of its own duties. However, this "segmentation model" is prone to cause internal information silo effect, which impedes the flow and sharing of information within the organisation. The traditional pyramid-type hierarchical organization adopts a command management style, and the workflow is dismembered, resulting in a lack of organisational resilience. In addition, the limited and single knowledge structure cannot match the core productivity in the Internet era.^[4] In the era of VUCA, the external environment in which enterprises are located has changed dramatically, and user needs have become increasingly diversified, so the traditional organisational operation model is facing challenges and its drawbacks are becoming increasingly obvious. In order to actively respond to the changes in the external environment and adapt to the speed and intensity of organisational change, organisations need to gradually shift towards agility and flattening. However, the shift from a traditional hierarchical organisation to an agile and flat one requires corresponding adjustments in the human resource management system. Accompanied by the application of the Internet, artificial intelligence and big data technology, communication barriers and information silos between modules are gradually disappearing and being broken down, making information exchange more fluid and making it possible to carry out cross-departmental services for personnel.

2.2. Blurring of organisational and sectoral boundaries

A typical characteristic of the VUCA era is ambiguity. At present, with the application of digital intelligence technologies such as the Internet, artificial intelligence and big data, as well as the development of the sharing economy and the zero-work economy, the boundaries of organizations and internal departments are increasingly blurred. First, the work of the enterprise can be completed by diversified employment methods, such as flexible employment and zero-workers, etc. Therefore, the object of human resource management includes internal employees and external related work groups; second, employees do not have strict departmental affiliation, and they take on different job responsibilities according to their own abilities, which is more conducive to giving full play to the employees' own abilities and achieving a high degree of fit between abilities and jobs, to Optimise resource allocation. Thirdly, under the background of zero-work economy and sharing economy, the contractual relationship between the organisation and the employees has changed significantly, from the traditional pure employment mode to a more loose and free cooperation and symbiosis mode. Under the new employment model, employees are motivated and innovative to create more value for the organisation through their work platforms, enabling the organisation to release vitality across the board. However, the relationship between organisations and employees is also becoming increasingly marginalised in an increasingly open and borderless working model, which prevents organisations from investing in the development of their employees and challenges traditional organisational employee relations.^[5]

The rapid development and application of digital technologies such as mobile internet, artificial intelligence and big data have made the society more and more intelligent, while the traditional human resource management has been severely challenged in the vague and complex VUCA era. The emergence and development of mobile internet breaks the time and space limitations, thus changing the traditional working mode, which is best reflected in the home office during the new crown epidemic. After the application of artificial intelligence technology gradually replaced those simple and tedious work in human resource management, the work of human resource management tends to be more strategic and the content of the work is becoming more and more complex, which makes human resource management gradually transformed into a strategic and digital intelligence mode.^[6] In addition, the emergence of big data has transformed HRM into a strategic and digitalised model. In addition, the emergence of big data will free human resources managers from the daily transactional work, and then devote more time and energy to strategic development.

3. Importance of digital intelligent human resource management

With the onset of the VUCA era, human resource management in enterprises is undergoing a significant transformation. This transformation is not only limited to the integration of human resource management function modules, but also encompasses changes in data, business, and human system coupling. It affects various aspects of the enterprise, including organizational structure, work modes, and management concepts. The goal is to establish a new digital ecosystem for enterprise operations. The new ecosystem represents a new era, a new situation, and a new direction for enterprise digital management. Digital intelligence is the organic combination of "digital" and "intelligent", in other words, it refers to the integration of big data analysis in human intelligence thinking, so as to improve the effectiveness of data and provide intelligent services for human work. In other words, it refers to the integration of big data analysis into human intelligence thinking, so as to improve the effectiveness of data and provide intelligent services for human work. So, what is the utility that can be achieved by adopting digital intelligence in human resource management practice?

3.1. Data-driven decision-making to improve management efficiency

Data-driven decision-making is the primary feature of the digital age. MIT, McKinsey Business Technology and Wharton School have jointly collaborated to conduct structured interviews with executives from 300 publicly traded companies in North America, and the results show that regardless of the attitude of each industry towards the application of big data, companies in industries characterised by a high degree of data-driven decision-making tend to be more able to objectively measure the state of their financial operations and are up to three times more efficient than the average company in decision-making, outperforming competitors by 5 per cent in production capacity and 6 per cent in profitability. competitors by 5 per cent in terms of production capacity and 6 per cent in terms of profit.^[7] Therefore, the use of data mining techniques in human resource management practices can provide intelligent analysis solutions based on validity and effectively improve the efficiency and quality of human resource management decision-making.

3.2. Digital innovation for business growth

How to fuel business growth from a human resources perspective in order to achieve synergy between the organisation and its employees is a key topic for HRM today. Essentially. First of all, it is necessary to gain a deep insight into the strategic orientation and business pain points of the enterprise, and give targeted human resources planning solutions and countermeasures to activate and give full play to the value of highly dynamic human resources, innovate enterprise products and services, and help business growth. Human resource management empowered by digital intelligence builds an intelligent talent data analysis platform for enterprises, relying on talent profiling, job profiling and job-matching analysis to intelligently plan and analyse corporate talent, which can be expanded to include exit prediction and high-potential prediction to help managers more efficiently execute and innovate their business.

3.3. Empowering every employee and reshaping the employee experience

In the process of digital transformation of human resource management, the change is not only in the way of management and technology, but also in the new concept, new thinking and new direction of human resource management, in other words, linking the employees and the enterprise through the digital technology, empowering each employee, and bringing a different digital innovation experience to each employee through innovative data systems and services, in order to activate the potential value of the employees. In the process of synergistic development of the enterprise and employees, it enhances and consolidates its core competitiveness and multiplies its performance.

3.4. Simplify HRM process and enhance control capability

Managers can be freed from trivial and simple transactional work, which is the most obvious feature after the transformation of HRM digital intelligence. Relying on big data and AI technology, managers can adopt AI interviews and sign e-employment contracts, which greatly simplify the process of human resource management. In addition. Algorithmic models such as Random Forest Algorithm and Boosting Algorithm can also be used to carry out the propensity to leave the company and strengthen the predictive analysis of the departure rate, which can further improve the ability to control the risk of loss of key talent.^[8]

4. Realistic dilemmas of the transformation of HRM digital intelligence in enterprises

4.1. Lack of digital human resource management concepts and outdated management methods

Influenced by traditional thinking, management is unfamiliar with the concept of big data and is old-fashioned in its thinking, and may not be able to recognise the value of the digital transformation of the enterprise. Some enterprises only pay attention to profits and marketing and sales, and do not pay attention to such functional management as human resource management. At the same time, there are also some enterprises that lack standardised internal management, and their managers' management thinking is not pioneering and only stays at the level of business operations. In the traditional business model, employees are bound to the daily operation of the enterprise, so it is difficult to stimulate their inspiration, bring new innovative thinking and improve work efficiency. Employees only focus on their own work, which leads to poor management performance. The concept of human resource management is relatively backward, and not enough attention is paid to the training of talents, even in the era of traditional human resource management mode. In the context of the VUCA era, enterprises are gradually recognising the importance of cultivating core talents, and starting to pay attention to HR management within the enterprise, especially realising the significance of HR agility.

4.2. Lack of special technical funding support, and the application of digital intelligence platforms is not widespread

Financial constraints have limited the application of HRM digital platforms, and enterprises are often unable to pay the high development and application costs of the platform programmes. Some SMEs prefer to invest their limited funds in product innovation, research and development and market development than in management intelligence. Under the uncertain external environment, SMEs are beginning to introduce information processing systems and explore the digital transformation of human resources. Some enterprises have started to introduce digital intelligence platforms in a targeted manner, using them to improve operational efficiency and reduce operational costs. However, such platform applications are only selected on the basis of research and development by industry leaders, and cannot fully realise the full integration of agility and internal HR management in the context of digital intelligence technology.

4.3. Misinformation in section organisations and difficulties in coordinating digital intelligence transformation

In the era of digital economy, human resource management mechanism can only adapt to the development of the times if it is flat or even interoperable. However, in the process of scale expansion, enterprises have been infected with "big business disease" such as too many layers, redundant organizations, increased management costs, complex labour relations, and the traditional management model of hierarchical relationship determines the command-subordinate relationship between individuals and organizations, and the rigid management style will, to a certain extent, stifle innovation and leave hidden dangers for the future intelligent transformation of human resource management. The rigid management style will, to a certain extent, stifle innovativeness and leave hidden dangers for the future intelligent transformation of human resource management. Coupled with the fact that in a hierarchical organisational model, the transmission of information is slow or distorted, resulting in poor decision-making, inability to mobilise staff, and inability to implement the smart transformation programme. Lack of vertical communication affects the direction of work; lack of horizontal communication reduces corporate efficiency. It is urgent to change the human resource management model with solidified structure and solidified roles. Intelligent transformation of human resource management requires collaboration and cooperation between departments, but the traditional organisational form is that different departments "manage their own business", which is easy to form a fixed pattern of interests and bureaucracy, so that the flow of information is not smooth enough, and employees can't quickly respond to changes in demand and create value. Moreover, since the enterprise's production system, marketing system, financial system, and personnel system operate independently of each other, the enterprise's expansion into different regional markets requires the development of personnel system software and infrastructure. This often results in a lack of real-time feedback to the enterprise's central decision-making processes, making data mining across different business segments more challenging.

5. The realisation path of the transformation of HRM digital intelligence in enterprises

Under the complex VUCA background, human resource management will rely on the advanced digital intelligence technology platform to update and process human resource data in a timely manner, so as to realise the digital intelligence transformation of human resource management in a scientific, standardised and efficient manner. In order to solve the existing problems of traditional human resource management and get rid of the real dilemma of enterprise human resource digital transformation, the human resource management department should make use of the digital technology to achieve the digital transformation of human resource management in the aspects of recruiting, educating, employing and motivating to enhance the organisational resilience of the enterprise in the face of the risk of uncertainty in the era of VUCA, and to safeguard the sustainable development of the enterprise.

5.1. Selection - Digital intelligent recruitment and selection

Traditionally CV screening decisions are made by HR based on speculation based on recruitment experience and background knowledge when reading CVs, so the workload is extremely high. Therefore, the Numerical Intelligence stage first needs to structure this information to improve the efficiency of the subsequent work. CVs collected from MileagePlus, Wise Care, China Talent or other vertical recruitment websites, WeChat, social networks and other channels are often in html, word, pdf format, with standardised structure and complete content, which can be easily structured and extracted. For resumes received from company websites and mailboxes, we can accurately identify job titles, person names and resume attachments and process them into structured data through email resume parsing service. For paper resumes received at on-site job fairs, they can be scanned and structured through OCR software. Next, you can create your own intelligent CV library, using commercially available CV management tools to parse CVs, manage talent information databases, and analyse crowd profiling. Through efficient resume management, we aim to quickly identify and match the most suitable talent for job positions, in order to win the battle for talent recruitment. In the initial screening of the interview, AI interview technology can be used, according to the interview participants of the question content, physical behaviour, facial expressions and other aspects of the lie detector, emotion, stress and other tests, in the intelligent assessment results for human resources managers to refer to decision-making.

5.2. Employment - Digital intelligent staffing and performance appraisal

Enterprises in the employment point of view to do the division of labour, habitually will choose "fixed post" rather than "fixed ability". But in fact, the logic of employment should be based on the company's strategic objectives system, deconstruct the business system, and then deduce the ability system. Therefore, in the division of labour within the enterprise, it is necessary to combine the static departmental responsibilities and job descriptions with the dynamic cycle of planning and delivery requirements. With the help of big data analysis technology, the corresponding talent portrait is firstly generated based on the basic information, potential ability information, performance information, career preference and other information of the talents; then, the job portrait is generated based on the basic information, work scope, qualification conditions, specific duties and other condition information of the positions; finally, the two are intelligently matched to improve the science and suitability of the talent resources.

Adopting an OKR-based process algorithm, the overall corporate goals, departmental goals, and individual goals are effectively associated with each other, and the final individual performance goals are automatically derived. Key factors are extracted after modeling using actual performance data in the performance goals, real-time intelligent total and structural analysis is carried out, and they are displayed in real time according to demand. Based on the node data in the process of the performance goals and behaviors, the state is identified, the completion value of the current state is collected, the performance level is generated in real time, and a dynamic performance algorithm is formed. In short, by realising the node online to the whole process online, the data can be acquired and read in time, together with the support of the performance algorithm model, the completion progress of different performance subjects in the OKR system can be displayed in time.

The organisation collects data from a wide range of digital devices covering employee biometrics, textual information and web footprints.^[9] To understand the sequence and duration of their work behaviours, work emotions and attitudes.^[10] Organisations can even use machine learning in conjunction with employee communication records. Organisations can even use machine learning algorithms or simulation models in conjunction with employee communication records to infer the structure of

employees' work relationship networks. These data help organisations to grasp the details covering all aspects of organisational activities and employee behaviours.^[11] This provides a powerful basis for HR system development and decision-making. For casual workers who work outside the boundaries of the organisation for long periods of time, this unidirectional, accurate and comprehensive recording and evaluation is almost the only way for them to connect with the organisation: software such as Uber uses GPS and mobile communication devices to record the geographic location of all employees, their work behaviours, and the identity of their customers, and to provide instant, anonymous evaluation and feedback.^[12] They are the only way to connect and manage their employees.

5.3. Nurturing people - Intelligent training and development

Employee Training Process Based on AI Assessment and Resource Push Applying AI technology to the whole process of employee training is the key to improving the core competitiveness of enterprises. Accordingly, the first step is to establish an automated assessment system for employees, including: (1) designing a clear learning map, employees need to follow the set learning path to complete course learning, test questions, and practical tasks. (2) The appraisal system will randomly select the knowledge points learned by the employees, interact with people through virtual robots, conduct virtual dialogues, and carry out appraisals in this form, and then score the mastery of each knowledge point based on the algorithmic model. (3) Supervisors and others will use the management evaluation module to rate the mastery of each knowledge point based on the actual behaviour of the trainee. Then, the evaluation system will feedback the data of each person's weak knowledge point to the AI learning resource push system and AI intensive training system, and the AI learning resource push system will push cases, courses, live broadcasts, and short videos related to the knowledge point for the employees to choose their own learning; the AI intensive system will extract courses, test questions, and practical exercises in the assessment system about the knowledge point, and make up small special training plans to be sent to the trainees for intensive learning. The AI reinforcement system will extract the courses, test questions and practical exercises on the knowledge point from the assessment system and push them to the trainees to carry out reinforcement learning, so as to promote the employees to improve the corresponding ability. The entire system encompasses learning, rehearsal, practice, feedback, testing, tracking, and business results, forming a comprehensive learning and assessment tracking closed loop. At the same time, personalised learning plans are pushed out for the weak knowledge points of the students, so as to realise the empowering training for thousands of people.

Advances in digital technology have given rise to talent analytics practices based on big data, predictive algorithms, data mining and visualisation tools.^[13] Through comprehensive and instantaneous data collection and updating of employees, managers are able to grasp stable individual characteristics such as personality and educational background, as well as changing status characteristics such as seniority and personal skills, and even relationship dynamics such as personal influence and inter-employee interactions, which can be used to guide team staffing, talent development and other personnel decisions. Among them, talent profiling for individual employees and talent inventory based on the organisation's overall situation are two representative practices in the talent analysis process. Through talent profiling of individual employees, managers can identify learning and training needs for better HR development. In addition to the detailed portrayal of talent, digital technology facilitates the practice of organisational talent inventory and enables managers to have a holistic understanding of the organisation's human capital. Relying on digital intelligence technology, managers can simply and concisely react to the characteristics of their employees through quantitative data and conduct internal training and development planning accordingly.

5.4. Motivating people - Digital intelligent compensation design and reward and punishment mechanisms

In terms of payroll design, comprehensive data and sophisticated algorithms can help organisations achieve flexible and dynamic design and seek the "optimal solution" for payroll design. In this regard, organisations mainly use digital technology to automate the payroll process, rational payroll design and effective payroll communication, and make it easier for managers to access key internal and external payroll-related information, and at the same time streamline the internal payroll decision-making process through various payroll tools that enable payroll-related information to be transmitted between managers and employees all the time.^[12,14] The payroll decision-making process is streamlined within the organisation. Through systematic information collection and efficient calculation, it can set salary levels for employees that match their contributions and promote individual fairness in salary policy; through

job analysis and evaluation at the organizational level, it can optimize the distribution of salary and compensation among different types of work and promote internal fairness in the organization; through the search and processing of salary information in the external market, it can make employees' salaries match the prices in the external labour market and promote external fairness and promote external equity. With the establishment of various big data cloud platforms, many industry salaries and benefits are almost transparent, and enterprises can dynamically track changes in industry salaries and benefits and adjust the proportion of salary and benefit components and the overall level of treatment in light of the actual situation, so as to remain competitive externally and attractive internally. For example, by analysing the industry's big data on salaries, it can see where the gap between the enterprise and the industry lies, and determine whether it is necessary to raise the basic salary of the entire staff, increase the salary grades of posts, and implement the target responsibility annual salary system for senior management, etc., so as to eliminate the health care factors that may cause dissatisfaction among employees.

In addition, through big data mining processing, analysis and prediction, we can understand the urgent needs of employees for the targeted design of personalized compensation and benefits, which can effectively improve labour relations. Firstly, it can enrich the life of employees, keep the channels of employees' complaints open, and enhance the sense of belonging of employees. Secondly, through the big data analysis of the gate forward, you can predict the tendency of employees to leave in advance. Change the attendance abnormalities, performance decline, team tension, and other concerns as a precursor to leave the traditional way of judgement, but instead of big data analysis of employee personality, industry development changes, the internal and external environment of the enterprise, etc. In advance taking a series of targeted preventive measures can be rotated through the rotation, sent to study, training and other ways to achieve multi-directional communication between the enterprise and the staff, employees, in order to enhance their participation in the development of the enterprise's awareness, to ensure the stability of the talent team. Relying on digital intelligence technology, human resource managers can provide employees with more humane, convenient and self-selected cloud incentive programmes. In the regular employee contract management process, the drive of cloud technology improves the efficiency of file management and gives employees who have a tendency to leave the company full respect and a convenient exit procedure, which can win the hearts of the employees in terms of word of mouth and emotion.

6. Conclusions

In the VUCA era, the environment changes frequently and is uncertain, HR management faces more challenges and opportunities, which requires HR departments to be more flexible and adaptive to changes, and be able to make decisions and adjustments quickly. In the era of digital intelligence, the market is changing rapidly, product iteration, industry transformation is very rapid, some repetitive work and single work is gradually replaced by digital intelligence technology. The digital and intelligent operation of enterprises will inevitably require that the construction of human resource management mechanism will inevitably move from the position-based to the ability-based, and ultimately to the value creation based on the digital and intelligent management, in order to allow enterprises to create more value and obtain more profits. Therefore, enterprises can create rich application scenarios in the core links of selecting, employing, educating and motivating people, and take big data, cloud services, mobile Internet, AI and other technologies as the grips to provide digital intelligent services for the enterprise management and each employee, which not only provides more accurate data support for the decision-making layer, but also improves the happiness index of the employees' work more efficiently, so as to realise the digital intelligence transformation of the enterprise's human resource management.

References

- [1] He Guangyuan, Zhao Shuming, Shi Yang, Zhao yixuan.(2020). *Analysis of the "Four Elements" Theoretical Model of Human Resource Management in VUCA Environment. Research on Finance and Trade*, 31(11),65-76.
- [2] Xin Jie, Xie Yongzhen, Fan Lin.(2020). *Origin, dimensions and measurement of quantum leadership in the context of VUCA. Business Economics and Management* (04),39-51.
- [3] Zhang Jie, Chen Zhisheng.(2023). *Exploring Human Resource Management Digital Transformation in the Digital Age. Journal of the Knowledge Economy*.
- [4] Li Jin, Liu Hong, Liu Shantang.(2015). *Electronic human resource management in the "Internet+" era: Theoretical evolution and constructive direction. Jianghai Journal* (06),102-107.

- [5] Xie Xiaoyun, Zuo Yuhan, Hu Qiongjing.(2021). *Human resource management in the digital era: a perspective based on human-technology interaction. Management World*, 37(01),200-216.
- [6] Xiao Xingzheng, Ran Jingliang, Long Chengchun.(2018). *Research on the impact of artificial intelligence on human resource management. Journal of Sichuan Institute of Technology (Social Science Edition)*, 33(06),37-51.
- [7] Wang Lili.(2021). *Digital Intelligence Transformation and Upgrading Empowers Enterprises to Manage Efficiently. China Construction Informatisation* (10),34-35.
- [8] Wang Wenjing.(2021). *Digital Intelligence Technology Driving Business Innovation. Manager* (12), 12-14.
- [9] Kellogg, K.C., Valentine, M.A., Christin, A. (2020). *Algorithms at Work: the New Contested Terrain of Control. Academy of Management Annals*, 14(1),366-410.
- [10] Ball, K.S., Margulis, S.T. (2011). *Electronic monitoring and surveillance in call centres: a framework for investigation. New Technology Work and Employment*, 26(2),113-126.
- [11] Ravid, D.M., Tomczak, D.L., White, J.C., Behrend, T.S., (2020). *EPM 20/20: A Review, Framework, and Research Agenda for Electronic Performance Monitoring. Journal of Management*, 46(1),100-126.
- [12] Duggan, J., Sherman, U., Carbery, R., McDonnell, A., (2020). *Algorithmic management and app-work in the gig economy: a research agenda for employment relations and HRM. Human Resource Management Journal*, 30(1),114-132.
- [13] Gal, U., Jensen, T.B., Stein, M.K., (2020). *Breaking the vicious cycle of algorithmic management: a virtue ethics approach to people analytics. Information and Organization*, 30(2).
- [14] Leonardi, P.M, (2018). *Social Media and the Development of Shared Cognition: the Roles of Network Expansion, Content Integration, and Triggered Recalling. Organisation Science*, 29(4),547-568.