




Talent approaches for the South African automotive industry

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Orientation: South African automotive organisations require talented employees to compete both nationally and on a global scale, within the setting of Industry 4.0.

Research purpose: This article was aimed at identifying talent management approaches for South African automotive organisations to ensure the availability of talent for Industry 4.0 talent demands.

Motivation for this study: In general, South African organisations struggle with securing, developing and retaining talent, a challenge aggravated by accelerated technological breakthroughs accompanying Industry 4.0.

Research approach/design and method: This article reports on the quantitative component of a combined method study conducted in South Africa's automotive industry. Data were collected from operational and human resource management professionals in automotive organisations through convenience sampling.

Main findings: A greater collaborative effort is required of key stakeholders associated with the automotive industry and within automotive organisations to address the issue of talent in a holistic and focused manner.

Practical/managerial implications: The adoption of advanced technologies in the automotive industry necessitates the upskilling and reskilling of current employees, and a renewed focus on attracting talent specifically targeted for Industry 4.0 developments which require collaboration between government, automotive industry, and educational institutions.

Contribution/value-add: The article emphasised a holistic approach to talent supply and management for South African automotive organisations in consideration of Industry 4.0, with implications for the government, educational institutions and the automotive industry.

Keywords: automotive industry; Industry 4.0; robotics; talent approaches; human-robot collaboration.

Introduction

Industry 4.0 is transforming society and organisations through the development and adoption of advanced technologies including robotics, 3D printing, the Internet of Things (IoT), and artificial intelligence (AI) (Schwab, 2016). For organisations, these technological advancements reduce labour costs, better productivity, increase resource efficiency, which in turn, increase organisational competitiveness. However, in South Africa there is still an absence of an ecosystem to embrace new technologies and bridge the technological gap created by Industry 4.0 (Li, 2017). It is reported (Martin, 2022) that major vehicle manufacturers in South Africa invested more than 8 billion dollars in the sector in both 2020 and 2021. Organisations should therefore not only focus on technology but also reconsider approaches for repurposing talent in this environment.

Globally, collaborative robots (Cobots) have been added to traditional industrial robots on the production lines organisations in the automotive industry (Calitz et al., 2017). For example, it had been reported that an automotive organisation had deployed more than 300 Cobots within a few months to automate routine tasks including material handling, machine tending, packaging, and assembling and in turn, speed up its reply to Industry 4.0 (ABB Robotics, 2018). South Africa is following this trend; Laugsand (2017) argues that South African organisations do not have a choice but to follow international trends associated with Industry 4.0. This implies that South African organisations have to adjust to collaborative work and apply change management practices.

Smart factories are created by the deployment of Cobots and real-time information systems, which enable robots and employees to work seamlessly together to produce products in an interconnected, interdisciplinary, and dynamic work environment (Prifti et al., 2017). As leader of technological advancements within South Africa, automotive organisations expect employees to function safely, seamlessly, and productively with robots on its assembly lines. Adapting to such an environment may create tension among employees' past work experiences and the world of Cobots, and resolving this tension successfully has bearing for the success of an organisation (Keywell, 2017). Being an important employer (e.g., more than 110 000 employees) and contributor of 4.3% to the country's gross domestic product (GDP) (Martin, 2022), a major challenge for South African automotive organisations is not only to successfully manage talent but also to stay relevant in the extremely competitive world of Cobots (Allen, 2017).

Talent is highlighted as the main driver of organisational success in Industry 4.0; hence the shortage of talent is aggravating as the war for talent is enduring (Schwab, 2018). Therefore, to address Industry 4.0 requirements, South African automotive organisations need to adopt an impressive talent management approach to attract, develop, and retain talented employees. Phillips (2018) notes that the effective design and implementation of talent management approaches has been a recurring challenge for organisations in South Africa stretching back to the early 1900s, and as such, the country has only about 16% of the required talent to successfully compete with global organisations in Industry 4.0. South Africa's talent debacle is also aggravated by its youth lacking the needed experience and education (Babshet, 2017) to have a pressing effect on the economy. It is therefore crucial to identify talent management approaches for South African automotive organisations, specifically within the context of Industry 4.0, that motivated undertaking this study.

Research purpose and objectives

The purpose of the article was to identify talent management approaches for meeting Industry 4.0 talent demands for South African automotive organisations. This article reports on the second phase of a broader multimethodology study conducted within South African automotive organisations. In the first phase of the study, emerging job categories and skills linked to Industry 4.0 were identified through data mining and interviews, and this article therefore focuses on talent management.

Literature review

The literature review focuses on the advancement of industry and characteristics of Industry 4.0, the concept of talent and talent management approaches for organisations operating within the context of Industry 4.0.

The advancement of industry

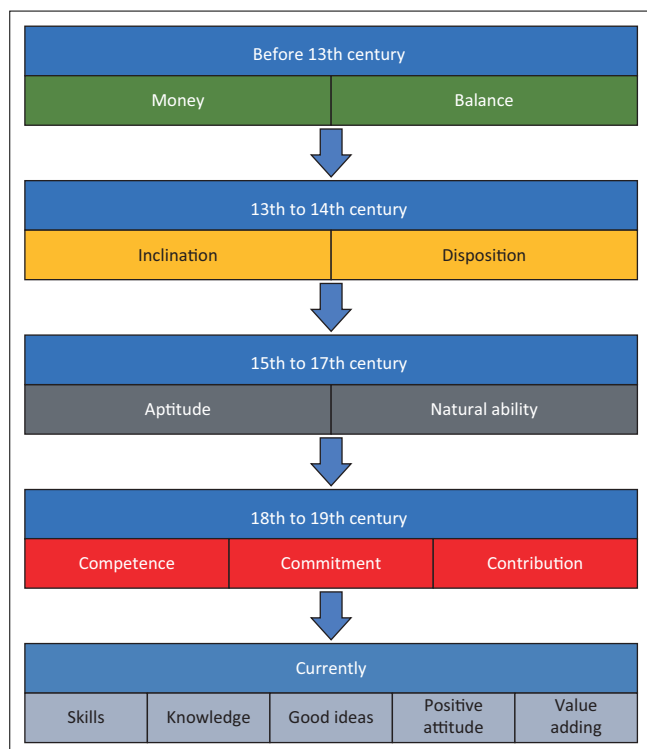
As part of an industrial evolution, Industry 4.0 is not to be viewed in isolation. During the previous industrial

revolutions, technology advanced before each of the evolutions manifested and organisations, in turn, were not given passable time to develop rules for governing emerging technologies and optimising the available opportunities (Sung, 2017; Wee, 2018). Industry 1.0 was associated with mechanical production, Industry 2.0 with mass production, while Industry 3.0 gave rise to automated production (Butler-Adam, 2018; Schwab, 2016).

Besides being the only industrial revolution predicted beforehand, Industry 4.0 also allows for the reshaping of organisations in a planned manner (Gandhi, 2015). This includes ensuring that the right types of employees are available to address the talent requirements of unfolding job categories. Industry 4.0 manifests in the development of smart factories through smart technologies such as 3D printing, quantum computing, AI, automated systems, the IoT, machine learning, blockchain, robotics, biotechnology, and nanotechnology (Keywell, 2017; Ng, 2019; Schwab, 2016). As such, in automotive organisations, human-robot coexistence, cooperation and collaboration emerge where robots perform tasks such as material handling, welding, painting, and assembling, which were previously performed solely by humans (Calitz et al., 2017). The impact of Industry 4.0 is already evident in a shift of the description of talent. Talent is defined as a unique strategic resource that is used within an organisation to achieve sustained competitive advantage (Bussin, 2014).

Figure 1 illustrates how the meaning attached to talent has evolved over time. In previous centuries talent was equated with money, inclination and aptitude (Schwab, 2018); in the 18th and 19th centuries the focus moved to competence, commitment and contribution (Marwala, 2018), while with Industry 4.0 the focus is on skills, knowledge, good ideas (innovation), a positive attitude (resilience), and ultimately adding value to the strategic goals of the organisation (Schwab, 2018).

Although the advancement of industry into Industry 4.0 amalgamates and builds upon technological advancements from preceding industries (Joy, 2017; Voss, 2018), Industry 4.0 placed pressure on organisations to perform better than ever before which, in turn, will intensify competition in the South African labour market. Industry 4.0 is known for sophisticated human technical capabilities and technological advancements that lead to real-time value (Tiarti, 2015). As such, Industry 4.0 is accompanied by new design principles, which change traditional linear production design into a real-time integration of multiple stakeholders and work functions (Universal Robots, 2018). The design of Industry 4.0 leads to what had been described as a big shift and which is evident not only in operations through the compatibility of man and machine but also in the effectiveness of organisations (Keywell, 2017; Schwab, 2018). In this highly connected and integrated environment, organisations need not only to reconsider the meaning of talent but also be mindful of the fact that talented employees are vital for reaping the fruits accompanying Industry 4.0 (Laugsand, 2017; Matyszczyk, 2016).



Source: Authors' construction based on Marwala, T. (2018). *Auto production in South Africa and components manufacturing in Gauteng province*. Retrieved from <https://www.global-labour-university.org>; Schwab, K. (2016). *The Fourth Industrial Revolution: What it means, how to respond*. Retrieved from <http://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond>

FIGURE 1: The evolution of talented employees.

Industry 4.0 talent and talent approaches

Technological advancement and the globalisation of the business world accentuate the importance of Industry 4.0 talent. In Industry 4.0, talent includes both high potential- and high-performing employees who possess and demonstrate qualities such as excellent ideas, a unique set of skills, speciality expertise, a variety of intelligences, self-motivation, the ability to make moral judgements, and a positive attitude, all which add to the success of organisations (Caruso, 2018; McKinsey Company, 2012; Tansley & Tietze, 2013). Interviews with engineers, production managers and human resource (HR) practitioners in South African automotive organisations confirm that a blended skills set is needed by employees for meeting Industry 4.0 needs (Macpherson, 2021). These skills include: technical, digital, quality control (technical), cognitive flexibility, mathematical reasoning and efficiency (conceptual), language, networking, emotional intelligence (human) and flexibility, ambiguity tolerance, stress management and change management (personal) skills.

Effective talent management has become vital for responding to market demands, accelerating competitiveness, and enhancing organisational capabilities (Bussin, 2014; Irudayaraj, 2018). As a result of Industry 4.0, there is a shift from conventional habits of managing employees to the management of talented individuals needed in an evolving world of work (Korn Ferry, 2017). Effective talent management is an all-inclusive approach consisting of integrated activities for ensuring that the right person is occupying the right position at the right time to make a meaningful contribution

to the strategic goals of the organisation (Bussin, 2014). Talent management is therefore a dynamic process. For the successful implementation of predetermined talent activities, a multistakeholder approach that includes leaders, line managers and mentors, as well as individual employees is needed (Phillips, 2018). For example, line managers are not only expected to manage and assess the performance of employees but to also provide career guidance to assist employees in continuously adapting to changing talent demands in the organisation and industry. Employees themselves should comprehend their own developmental needs and embrace the developmental interventions of their organisations (Hirsh, 2015).

The formation of a futuristic workforce is pivotal in addressing Industry 4.0 talent challenges, especially in the automotive industry as the prevalent contributor to the South African GDP (Le Guern, 2017). Talent management commences with the identification of key Industry 4.0 talent longed for by organisations, from which the needed skills sets can be drawn (Keywell, 2017). Human resource managers need to adopt a strategic role in Industry 4.0, driving not only talent management superiority but also aligning talent approaches with overall organisational policies (Nel et al., 2011). Industry 4.0 talent management includes strategic talent planning, the creation of talent pools, on-going performance management, career and succession management as well as the purposeful acquisition, development, and retention of talent (Bersin et al., 2010; Bussin, 2014; Schwab, 2018). Talent can be boosted via on-the-job training, education, ensuring applicable skills sets, continuous updating of job knowledge, and adopting a positive attitude (Mashologu, 2013). Bersin et al. (2010) provided a framework for talent management that suggests aligning talent with Industry 4.0 business goals, recruiting talent aligned with Industry 4.0 future business goals, conducting workforce audits, developing hybrid skills in all employees, and aligning HR practices to talent needs. For example, succession planning, performance management, career development, and leadership development should be tightly aligned and focused on the hybrid skills required. Life-long learning and self-development should form part of the process, and in this respect the organisation must continuously reflect a culture of learning.

South African automotive organisations need a competent workforce to compete globally (Sharma & Naude, 2021). Consequently, automotive organisations should foster a culture of talent by obtaining Industry 4.0 talent and instilling a talent mindset among all employees. Attracting, developing and retaining talent, which have become problematic in Industry 4.0 must be optimised to ensure organisational performance (Schwab, 2018). Organisations should thus consider various talent management approaches and their relevance to repurposing existing talent in Industry 4.0 automotive organisations.

Attracting talent

As suggested, the emergence of Industry 4.0 produces novel job categories, which require a new set of skills to effectively

perform. As such, organisations have to reconsider talent approaches to ensure that they acquire talent (KPMG, 2018). Talent management dynamics has become a key success differentiator for organisations in Industry 4.0 as organisations strive to attract talent to meet both organisation and industry needs (Knox, 2013). In South Africa, finding and attracting talent remains a challenge as suggested by the World Economic Forum Global Competitiveness Report 2022. Out of 63 countries surveyed, South Africa obtained the 57th place for finding skilled employees, and 55th place for staff training. Digital skills among the active population obtained a low score of 3.3 out of 7.0, explaining why a war for talent exists and the need to develop technological skills among the South Africa labour force.

The extent to which employees identify themselves with the values and goals of an organisation is a powerful indicator of the organisation's ability to attract talent (Schwab, 2016). In this respect, an attractive employee value proposition (EVP) is essential (Boyko, 2014; Knox, 2013) as it signals to what the potential employees can expect of an organisation in terms of crucial issues such as personal development, rewards and remuneration, empowerment, and the work itself.

Mzezewa (2019) argues that organisations should adopt integrated approaches to attract the required talent. Failure to attract the appropriate quality and quantity of talent can negatively impact the productivity and competitiveness of automotive organisations. As a result of the scarcity of fit for purpose talent, automotive organisations should collaborate with other organisations and training institutions, effectively attract Industry 4.0 talent, appoint employees with specific purpose, share talent pools, and ensure continuous growth (Bersin et al., 2010). Automotive organisations could align themselves with the 4 Industrial Revolution in South Africa (4IRSA), a South African government initiative aimed at creating partnerships between government, industry and academia to establish a coherent and inclusive retaliation to Industry 4.0 (Babshet, 2017; Ncube, 2018; Phillips, 2018). When deciding on a talent strategy, it is important to consider the labour market, organisational goals, the nature of work, and the industry (Buttiens & Hondeghe, 2012).

Developing talent

The ever-changing world of work necessitates employees to be equipped with skills to address changing talent demands (Mzezewa, 2019; Spiesshofer, 2017). In the context of Industry 4.0, development can be seen as targeted and personalised interventions aimed at preparing employees for future organisational activities. Phillips (2018), a future studies expert, states that the talent demands of Industry 4.0 can only be addressed when a collaborative multilateral approach to developing talent is followed. Important stakeholders include government, academia, organisations, and trade unions (Phillips, 2018; World Economic Forum, 2017). For the automotive industry, such an approach could strengthen its talent pipeline and talent pool. In addition, Klimova (2016) suggests that both an inclusive and an exclusive process

should be followed for talent management. With an inclusive approach, all employees are considered as talent. With this approach, an employee's specific talent is identified and further developed. An exclusive approach to talent focuses on 'top graders' who are expected to make significant contributions to sustainable development and, in turn, the success of the organisation. These employees are specifically recruited and placed in positions related to emerging jobs and job categories, as well as in leading positions. They are given more freedom to craft their jobs and careers and in this way stay relevant and innovative.

For most organisations, talent development means nurturing and upskilling existing talent to meet the needs of Industry 4.0. Brewster et al. (2014) state that nurturing talent takes diversified forms with life-long learning at its centre. This is because the perpetual state of change requires comprehensive and long-term learning interventions. Phillips (2018) concurs, stating that both blue- and white-collar employees require upskilling, and this must be accomplished at a speedy rate to meet the requirements of a changing environment. He specifically suggests collaboration across disciplines, levels and organisations for impactful learning, with innovative learning methods that trigger rapid reskilling and fostering of learning as 'a way of life'. In addition, he suggests using virtual and augmented reality technology to simulate genuine work situations and use these for teaching smart skills, cementing operating procedures, monitoring progress, and coaching employees. Therefore, in the same manner that pilots are trained in flight simulators, employees can be taught in robotic simulators. These type of learning approaches foster the agile learning required for innovation.

The mentioned interventions can enable employees to acquire knowledge, skills and desired work-related attitudes that will enhance their performance. A powerful vision guiding behaviour, ongoing performance management, self-development, purposeful training and development, and talent audits are also strategies that impact development (Bersin et al., 2010; Phillips, 2018; Schwab, 2018; Spiesshofer, 2017). In addition, individual performance management practices should be implemented effectively and conducted regularly while rewards need to be based on performance. Alignment of performance with the overall organisational goals and the engagement of employees in performance management processes, conversations, and decisions are imperative for it to serve a developmental purpose.

Sharma and Naude (2021) argue that talent development contributes to the retention of qualified employees which, in turn, increases brand reputation. Considering the continuing war for talent in Industry 4.0, this is an important consideration for organisations. Similarly, a study conducted by Bartrop-Sackey et al. (2022) suggests that developing talent and deploying talented employees effectively are major factors in enhancing organisational competitiveness. Importantly, the study also revealed that developing employees is key to retaining them.

Retaining talent

Schwab (2018) stressed that with the war for talent ongoing, only those organisations in possession of the desired talent will survive, with talent retention remaining a priority. Globally, there is a lack of talent as employee turnover is escalating at an alarming rate (Keywell, 2017). Bussin (2014) argues that to avoid a lack of experience and to retain talent, organisations need to adopt an attractive talent retention strategy. A talent retention strategy should revolve around the following core items: competency mapping, focusing on retaining especially knowledge workers, securing Industry 4.0 talent, carefully planning for human resources, and adequately rewarding staff (Irudayaraj, 2018; Ncube, 2018; Phillips, 2018). Importantly, Schwab (2018) advises that investing in an effective talent retention strategy is vital in times of economic uncertainty.

In Industry 4.0, the retention of relevant talent is argued to have special importance within automotive organisations as the automotive industry is at the forefront of implementing new production technologies, with the purpose of gaining competitive advantage and improving productivity (Barkhuizen & Masale, 2022). Therefore, retaining talent is a crucial strategic human resource management strategy that cannot be overemphasised. Having talented employees increases the overall performance of an organisation as talent is equated with higher profits, productivity, and market value, as well as with higher levels of job satisfaction, employee motivation, commitment, and work quality (Barkhuizen & Masale, 2022; Bartrop-Sackey et al., 2022). As a result of the link between the employee experience and organisational branding (Bersin et al., 2010), automotive organisations should build an ecosystem of inclusivity and support.

Research design

Research approach

The purpose of this article was to identify talent approaches used by automotive organisations based on the observations of professions in human resource management (HRM) and operations/production. To determine the 'what', 'why', and 'where' of employee experiences, a quantitative research approach was adopted (Cassim, 2011). This approach is in line with a positivistic paradigm while the design was quantitative. Adopting this research approach meant that the findings of the study could be generalised (Saunders & Lewis, 2018).

Research method

Convenience sampling was used. An on-line questionnaire was administered via the platform QuestionPro and distributed via email, LinkedIn and WhatsApp.

Research participants

As stated, the target population of the study was employees in HRM, as well as in operations and production in South

African automotive organisations. The questionnaire was viewed by 526 potential participants and submitted by 162 participants, while 137 were identified as useable for data analysis, providing a response rate of 26%.

Table 1 presents descriptive statistics to describe the sample. The participants were mostly from the Eastern Cape province (91%), with 43% of the participants from organisations employing more than 1000 employees, 23% from organisations employing between 501 and 999 employees, and 24% from organisations employing between 101 and 500 employees. Participants were mostly either from motor vehicle assemblers (47%) or motor component suppliers (38%). Departments represented were mostly production and operations (60%), and HRM (21%). More than half of the participants fulfilled a leadership position (22% middle level manager, 11% supervisor, 21% team leader or 9% senior manager), while 39% were not in a leadership position. In terms of level of automation, 64% of the participants suggested that their organisations were automated to some extent, 9% suggested that their organisations were extensively automated, and a further 9% suggested that their organisations were almost fully automated.

TABLE 1: Biographical data of the study participants in Human Resource Management, operations, and production in the automotive organisations in South Africa.

Description	Frequency	Percentage (%)
Region		
Eastern Cape	120	91
Western Cape	1	1
Gauteng	11	8
Total	132	100
Organisational size		
0–500 employees	46	34
501–999 employees	31	23
1000+ employees	59	43
Total	136	100
Operational focus		
Motor vehicle, automotive and assembly	63	47
Components supply	51	38
Other	19	14
Total	133	100
Employment function		
Human Resource Management	29	21
Production and Operations	82	60
Other	26	19
Total	137	100
Position in organisation		
Senior Manager	9	7
Middle Manager	29	22
Not a Manager	52	39
Supervisor	15	11
Team Leader	28	21
Total	133	100
Level of automation		
Extensively automated	12	9
Almost fully automated	13	9
Automated to some extent	88	64
Not at all automated	24	18
Total	137	100

Measuring instruments

The first section of the questionnaire elicited biographical data as presented in Table 1. The second part of the questionnaire measured Talent Management Practices, using a Likert scale varying between 'strongly disagree (1)' and 'strongly agree (5)'. The statements for Talent Management Practices were formulated based on sources cited in the literature study (Babshet, 2017; Bersin et al., 2010; Irudayaraj, 2018; Le Guern, 2017; Ncube, 2018; Phillips, 2018; Schwab, 2018; Spiesshofer, 2017), and were specifically aimed at measuring talent management practices used in the automotive industry.

Research procedure and ethical considerations

The content and face validity of the questionnaire were confirmed by experts consulted in HRM and operations or production, research supervisors as well as a statistician. In addition, a pilot study was conducted among six potential participants. The reliability of the questionnaire was confirmed by Cronbach's alpha coefficients ranging between 0.79 and 0.89, which are considered good to excellent (Cassim, 2011). The processing and analysis of data were performed by means of Statistical Package for Social Sciences (SPSS). Ethical clearance to conduct this study was obtained from the Nelson Mandela University Research Ethics Committee: Human (No. H19-BES-HRM-010). Participants were informed of the purpose of this study, anonymity, right of withdrawal, and informed consent.

Statistical analysis

Various statistical analysis was conducted. Exploratory factor analysis (EFA) was employed to determine underlying relationships among the three factors and to determine a factor structure. Descriptive statistical measures were employed to determine the importance of the factors in Industry 4.0 automotive organisations. One-sample *t*-tests were employed to determine the interrelatedness of the three factors in this study while chi-square tests were employed to establish the level of dependence among the factors (Cassim, 2011; Crossman, 2013).

Results

Factor analysis

The EFA delivered three talent management practice factors (see Table 2). These were Attracting Talent, with an eigenvalue of 2.499 and explaining 62.5% of the variance in the data, Developing Talent, with an eigenvalue of 3.828 and explaining 63.8% of the variance in the data, and Retaining Talent, with an eigenvalue of 3.929 and explaining 65.5% of the variance in the data (see Table 2). The first talent management practice factor, Attracting Talent, was operationalised as purposefully appointing people with potential to learn and grow, collaborating with other organisations and academic institutions to acquire Industry 4.0 talent, and sharing a talent pool with other organisations. The second factor, Developing Talent, was operationalised as

TABLE 2: Descriptive statistics for talent management factors in Human Resource Management, operations, and production in the automotive organisations of South Africa.

Factors	Mean	SD	Alpha coefficient	Pearson's r 1	Pearson's r 2	Eigenvalue	% Total variance explained
Attracting Talent	3.28	0.83	0.79	-	-	2.499	62.5
Developing Talent	3.41	0.89	0.89	0.799	-	3.828	63.8
Retaining Talent	3.26	0.93	0.89	0.822	0.848	3.929	65.5

TABLE 3: One sample *t*-test results.

Variable	SD	<i>t</i>	Scheffé's <i>p</i>	Cohen's <i>d</i>	Significant
Attracting Talent	0.83	-1.74	0.084	n/a	None
Developing Talent	0.89	0.13	0.896	n/a	None
Retaining Talent	0.93	-1.72	0.088	n/a	None

encouraging self-development and life-long learning, conducting talent audits to determine the availability of appropriate skills, using performance management as a tool to ensure employees obtain the right skills, the development of advanced technical skills, and having a vision that fosters identity with the organisational goals. The third factor, Retaining Talent, was operationalised as securing Industry 4.0 talent for the future, mapping out skills available in the organisation, encouraging knowledge workers to remain in the organisation, using rewards effectively to retain talent, and the organisation being in possession of talent associated with Industry 4.0 (i.e., being successful in retaining employees).

Descriptive statistics, one-sample tests, correlation analysis

The mean scores, standard deviations, Cronbach's alpha coefficients and correlations for the Talent Management Factors are reported in Table 2.

The mean scores for the factors (Attracting Talent = 3.28; Developing Talent = 3.41; Retaining Talent = 3.26) indicate that the organisations surveyed used the Talent Management Approaches identified in the literature to a moderate extent, with aggregate means leaning towards the higher end of neither disagree nor agree answer options. The results do, however suggest that more attention was given to developing talent in comparison to attracting and retaining talent.

The one-sample *t*-test revealed (Table 3) that no practical or statistically significant differences were found in terms of Attracting Talent (SD = 0.83, $p = 0.084$, $d = n/a$), Developing Talent (SD = 0.89, $p = 0.896$, $d = n/a$), and Retaining Talent (SD = 0.93, $p = 0.088$, $d = n/a$). The Cohen's *d* was below 0.20 for all factors, while the Scheffé's *p*-value was higher than 0.05 for all factors. The conclusion was drawn that a fair level of homogeneity existed within the sample and the results could be confidently generalised to the population (Hair et al., 2011).

Correlations ranged between 0.799 and 0.848 for Talent Management Approaches, and this suggested that these factors are interrelated (Cassim, 2011; Gravetter & Wallnau,

TABLE 4a: Chi-square of independence between the variables of this research.

Developing talent	Attracting talented employees							
	Lower < Q1		Middle Q1–Q3		Higher > Q3		Total	
Lower < Q1	20	59%	13	38%	1	3%	34	100%
Middle Q1–Q3	11	15%	50	68%	13	18%	74	100%
Higher > Q3	2	7%	9	31%	18	62%	29	100%
Total	33	24%	72	53%	32	23%	137	100%

Chi-square ($df = 4, n = 137$) = 55.99; $p < 0.0005$; $V = 0.45$ Large.

TABLE 4b: Chi-square of independence between the variables of this research.

Retaining talent	Attracting talented employees							
	Lower < Q1		Middle Q1–Q3		Higher > Q3		Total	
Lower < Q1	22	59%	15	41%	-	-	37	100%
Middle Q1–Q3	11	16%	49	72%	8	12%	68	100%
Higher > Q3	-	-	8	25%	24	75%	32	100%
Total	33	24%	72	53%	32	23%	137	100%

Chi-square ($df = 4, n = 137$) = 88.35; $p < 0.0005$; $V = 0.57$ Large.

TABLE 4c: Chi-square of independence between the variables of this research.

Retaining talent	Developing talented employees							
	Lower < Q1		Middle Q1–Q3		Higher > Q3		Total	
Lower < Q1	24	65%	11	30%	2	5%	37	100%
Middle Q1–Q3	10	15%	51	75%	7	10%	68	100%
Higher > Q3	-	-	12	38%	20	63%	32	100%
Total	34	25%	74	54%	29	21%	137	100%

Chi-square ($df = 4, n = 137$) = 79.82; $p < 0.0005$; $V = 0.54$ Large.

2009). Attracting Talent showed a positive relationship with Developing Talent ($r = 0.799, p < 0.05$; large), Attracting Talent showed a positive relationship with Retaining Talent ($r = 0.822, p < 0.05$; large), and Developing Talent showed a positive relationship with Retaining Talent ($r = 0.848, p < 0.05$; large).

In addition, chi-square (χ^2) tests were carried out to determine whether statistically significant relationships existed between the various factors measured in this study; while the Cramer's V determined the practical significance of the relationships (Cassim, 2011; Saunders et al., 2011). A statistically significant relationship was found between Attracting Talent and Developing Talent ($p < 0.0005, \chi^2 = 55.99, df = 4$). It is also evident in Table 4 that the practical significance of this relationship was large (Cramer's $V = 0.45$). A statistically significant relationship was also observed between Attracting Talent and Retaining Talent ($p < 0.0005, \chi^2 = 88.35, df = 4$), with a large practical significance (Cramer's $V = 0.57$). A statistically significant relationship between the variables of Developing Talent and Retaining Talent ($p < 0.0005, \chi^2 = 79.82, df = 4$) was evident (see Table 4), with a large practical effect (Cramer's $V = 0.54$). These results suggested that the magnitude of the relationships between the variables are important moving forward. An integrated and unified approach to talent management is therefore essential to meet talent needs in Industry 4.0.

Discussion

The purpose of the article was to identify approaches for repurposing talent management practices in automotive organisations in South Africa in the context of Industry 4.0. The investigation was motivated by the automotive industry

being a significant contributor to GDP and a significant employer in South Africa, as well as automation and machine–human collaboration at the centre of Industry 4.0 in automotive organisations. In addition, Spiesshofer (2017) highlighted a misalignment between the demand and supply of talent in the country. This misalignment is aggravated when organisations fail to adopt creative and innovative techniques to attract, develop, and retain talent (Schwab, 2018). It was therefore important to determine how talent could be repurposed in the automotive industry where *only the fittest will survive* in the context of Industry 4.0 (Knox, 2013; KPMG, 2018).

The results revealed that South African automotive organisations were in the process of being automated, with 18% of participants indicating their organisations were fully or almost fully automated, and 64% indicating their organisations were being automated to some extent. These are trends related to Industry 4.0 that organisations in South Africa cannot ignore. The establishment of smart factories with Cobots, automated production and real-time information give rise to novel job categories, which require a blended skill set from employees (Macpherson, 2021). Employees need to seamlessly collaborate with advance techno-systems, adopt a system orientation, and add value through problem-solving, innovation and collaboration. Flexibility, self-management, networking and change management skills contribute to what is now considered as smart talent (World Economic Forum, 2022). As such, automotive industries need to clarify the meaning of talent, in line with their strategic goals, when they develop approaches to attract, develop and retain talent, which emerged as main factors in the study.

The mean scores obtained for the factors Attracting Talent, Developing Talent and Retaining Talent (Table 2) suggested that South African automotive organisations did not give talent management the due attention required for Industry 4.0. This is irrespective of the size of organisation or level of automation as evidenced in the t -test that did not reveal significant differences in the responses received. The findings in this study echo that of the World Economic Forum (2022) that highlighted challenges experienced in South Africa with recruiting skilled employees, partly because of a lack of digital skills among the active population (Schwab, 2018). Similar to the assessment depicted in the World Economic Forum (2022), this study revealed that staff development was rated higher than talent attraction, perhaps emphasising that the quality of recruits was not what was expected and therefore more resources and time had to be spent on training and development. Not giving talent management for Industry 4.0 the attention it requires, does not only have consequences for the organisations themselves but also for the automotive industry and the country as a whole (Schwab, 2018).

In terms of Attracting Talent, organisations in the automotive industry should consider their immediate talent needs, as well as the future talent needs of the industry. Industry 4.0 promises a highly integrated and connected world of work,

which requires a major shift (Keywell, 2017; Schwab, 2018) and this also signals that a shift in talent management approaches is necessary. In alignment with the South African government initiative, 4IRSA, automotive organisations should create and expand on current partnerships with government, other organisations, and academic institutions (Babshet, 2017; Ncube, 2018; Phillips, 2018) to ensure that Industry 4.0 talent is developed and prepared to meet the specific needs of the automotive industry. This could include establishing and sharing talent pools from which employees can be recruited and appointed. In addition, industry and organisational attractiveness play a vital role in Industry 4.0 as talent aims to associate themselves with an industry and an organisation that has an attractive futuristic vision and meaningful goals (Davies, 2017).

The results also suggested that the development of existing talent, specifically for Industry 4.0, needs more attention in the automotive industry. The participants did not convincingly indicate that their organisations conducted talent audits or used the performance management system effectively to ensure employees obtained the required skills. Highlighting self-development and life-long learning opportunities, and purposefully training and developing employees for an Industry 4.0 vision are other talent development approaches that could be improved and become attractive to employees. These results are concerning because the effective development of talent is not only a major contributor to organisational competitiveness but also assists organisations in retaining talent (Barkhuizen & Masale, 2022; Bartrop-Sackey et al., 2022).

With Retaining Talent, participants did not agree that their organisations carefully planned human resources to ensure the availability of talent. They also did not agree that rewards were effectively used to retain talent. These results are concerning because Schwab (2016) stressed that in Industry 4.0, the war for talent was on-going and only those organisations possessing the desired talent would survive. The results obtained in this study confirms the current inadequacy of South African automotive organisations to adopt approaches to retain talented employees (Mzezewa, 2019). Therefore, automotive organisations need to ensure that they conduct regular competency mapping, focus on the retention of knowledge workers, and effectively reward employees to ensure that they remain in the organisation. In addition, talented employees are eager to know what they will receive in return for anticipated performance. Therefore, organisations should deploy their EVP to communicate both long- and short-term organisational goals to both existing and potential employees.

Correlation, chi-square test and Cramer's V analyses suggested strong relationships and dependence among the factors, and specifically between Attracting Talent and Developing Talent, and between Attracting Talent and Retaining Talent. The correlation and interdependence of factors in this study can be seen in Figure 2. The results suggested that talent management starts with drawing talent into the organisation, then

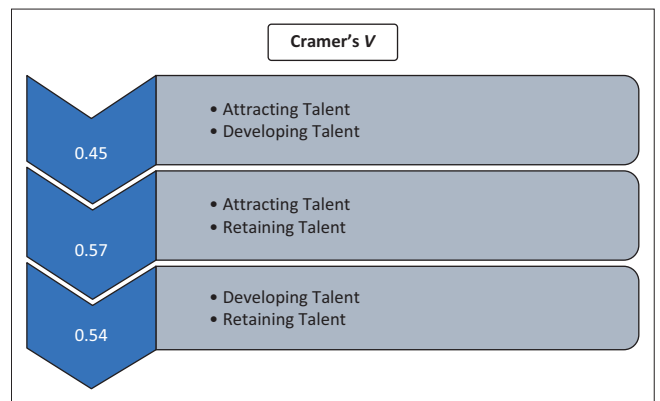


FIGURE 2: Correlation and interdependence of factors in the study.

developing and retaining talent. This could be understood in two ways. Firstly, talented people must be drawn into the organisation, their skills must be further developed and updated, and they need to be retained for continuity of excellence, innovation and knowledge retention within the organisation. All three of these factors are important for talent management in Industry 4.0 and a holistic and integrated strategy needs to be planned and implemented to ensure organisational competitiveness. Secondly, employing exceptional employees and providing them with excellent development opportunities and a positive employee experience create a positive organisational brand and image, which in turn will attract talented recruits. These results concur with that of Irudayaraj (2018) and Bussin (2014) who suggested that no single organisational or HRM activity can stand alone, but rather that all HR activities should be holistically integrated with the focus on meeting the goals of the organisation. Klimova (2016) suggested that both an inclusive and exclusive approach should be followed in talent development, meaning that all employees should be regarded as talent (i.e., inclusive approach), and specific talent identified, utilised and further developed (i.e., exclusive approach). Employees specifically appointed to fill emerging job categories requiring exceptional creativity associated with Industry 4.0 should be exposed to sophisticated learning opportunities in relation to their roles.

Value adding and management implications

The article emphasised a holistic approach to talent supply and management for South African automotive organisations in consideration of Industry 4.0, with implications for the government, educational institutions, and the automotive industry. The article contributes to the body of knowledge related to Industry 4.0 and talent management in automotive organisations. Talent lays the foundation for enhancing the competitiveness of an organisation. The effective and purposeful management of talent is therefore crucial for achieving organisational strategy and effectiveness. Therefore, with constant technological changes in the workplace, accumulating into Industry 4.0, existing employees need upskilling and reskilling, and new appointments must be done to meet the future requirements of an organisation. Automotive organisations should

collaborate with each other and external stakeholders, including the government and education organisations, to ensure a formidable talent supply to sustain competitiveness. The results of this article highlighted areas for automotive organisations that need more focus to improve talent management and meet Industry 4.0 talent demands.

This article underlined that Industry 4.0 is defined by collaboration, real-time information, and the development of an eco-system orientation. The same approach should be adopted for talent management in the industry. Government, educational institutions, and automotive organisations should collaborate to enhance the industry's competitive advantage through the provisioning, development and retention of talent.

The article benefits organisational leaders in understanding the holistic approach needed towards talent in Industry 4.0 and guides these leaders in creating optimal employee experiences. The results of this article suggested that a talent mindset is vital for Industry 4.0. Therefore, HR practitioners and operational managers need to work collaboratively in identifying specific training needs and challenges related to the supply of Industry 4.0 talent. It is evident that with new jobs emerging, organisations should not only focus on attracting new talent but also on nurturing existing talent through deliberate talent development and retention approaches. Therefore, an effectively developed and implemented, and an integrated and well-structured talent management system is pivotal for automotive organisations. Employees, however, need to be knowledgeable of the impact of Industry 4.0 on their jobs to increase their levels of motivation for engaging in training and development interventions.

As mentioned earlier in this article, automotive organisations should collaborate both with other national and international automotive organisations, educational institutions, and the state to nurture Industry 4.0 talent to create a future-fit talent pipeline. Talent management practices that are in favour of the retention of talented employees should form the basis of an Industry 4.0 talent strategy in automotive organisations. In addition, the ultimate focus of a talent strategy should be to attract, engage and retain much-needed talent, otherwise it is deemed ineffective. The results of this article are relevant to automotive organisations in its entirety and especially for the leaders, HRM departments and leaders in production, who have the collective responsibility of recruiting, developing and retaining talent within their organisations to create sustainable competitive advantage.

Limitations and recommendations

This research had few limitations. Firstly, most of the participants in this study were from the Eastern Cape province in South Africa with less participation from other provinces. However, the automotive sector is the second largest employer in the region and the hub of the automotive sector in South Africa. Secondly, this research was quantitative, making use of a survey with a questionnaire as data collecting tool. A qualitative study on challenges

experienced in recruiting, developing and retaining talent in the automotive sector could have provided more depth and could be undertaken in the future.

Conclusion

Industry 4.0 is significantly reshaping the workplace with the emergence of advanced technologies, such as Cobots and real-time information systems in automotive organisations, resulting in the rise of novel job categories and a blended skills set needed by employees. This requires the upskilling and reskilling of existing talent in the organisation and ensuring that any future recruits are carefully selected to meet the forecasted organisational requirements. With the global war for talent ongoing, a collaborative approach confining an integrated approach for attracting, developing, and retaining talented individual is needed.

The automotive sector in South Africa is important to its economy and therefore collaboration between the government, educational institutions, and automotive organisations are required for ensuring that talent is provided and channelled towards the needs of this industry. As such, a coherent and integrated approach to talent supply and development is needed. Automotive organisations should develop a talent pipeline strategy that is future-focused and continuously updated and supported by a formal policy on employee development focused on both entry-level and existing employees at all levels. A talent strategy should be linked to performance management and a succession plan to ensure that both high performing and high potential employees develop the required skills for managing the disruptive change accompanying Industry 4.0, based on a proper talent and training needs analysis.

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Competing interests

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Authors' contributions

W.M. was responsible for data collection, data analysis and preparing the manuscript – the work is based on his PhD studies. A.W. and M.M. supervised the study. All authors discussed the findings and contributed to the final manuscript.

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Data availability

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