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HAUPTBEITRÄGE – OFFENER TEIL

HR analytics between ambition and reality

Current state and recommendations for the contribution of work and organizational psychology

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Abstract
This exploratory study in the Journal "Group. Interaction. Organization" investigated the degree of implementation and the benefits of HR Analytics in Switzerland. As part of the study, 133 companies were surveyed. In addition, 12 interviews were conducted to obtain more in-depth insights into the core results. The results show that the majority of companies are still primarily doing backward-looking descriptive data analytics. Furthermore, there is a gap between expectations and actual achievements associated with HR Analytics. The interviews make it clear that data quality and the necessary competences are key challenges in terms of implementation. In order to achieve greater benefits with HR Analytics, the insights gained should lead to the implementation of measures and clearer reference to business-relevant parameters. Therefore, fully realizing the high potential of HR Analytics will require additional effort. In the discussion section, we consider the current literature and, based on our results, derive practical implications for a better establishment of HR Analytics. We also discuss the potential of Work and Organizational Psychology to shape the rapidly growing field of HR Analytics.

Keywords HR Analytics · Level of implementation · Benefit · Data quality · Skill set

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HR Analytics zwischen Anspruch und Wirklichkeit

Aktueller Stand und Empfehlungen für den Beitrag der Arbeits- und Organisationspsychologie

Zusammenfassung

Diese explorative Studie in der Zeitschrift „Gruppe. Interaktion. Organisation." untersuchte den Umsetzungsgrad und den realisierten Nutzen von HR Analytics in der Schweiz. Im Rahmen der Studie wurden 133 Unternehmen befragt. Zusätzlich wurden 12 Interviews geführt, um einen vertieften Einblick in die Kernergebnisse zu erhalten. Die Ergebnisse zeigen, dass die Mehrheit der Unternehmen nach wie vor primär rückwärtsgewandte, deskriptive Datenanalysen durchführen. Zudem klafft eine Lücke zwischen den Erwartungen, die mit Analytics verbunden sind, und dem tatsächlich realisierten Nutzen. Die Interviews machen deutlich, dass die Datenqualität und die notwendigen Kompetenzen zentrale Herausforderungen bei der Umsetzung sind. Um einen größeren Nutzen mit HR Analytics zu erzielen, sollten die gewonnenen Erkenntnisse zur Umsetzung von Maßnahmen und einem klareren Bezug zu geschäftsrelevanten Kenngrössen führen. Um das als hoch eingeschätzte Potenzial von HR Analytics voll auszuschöpfen, sind also weitere Anstrengungen erforderlich. Im Diskussionsteil gehen wir auf die aktuelle Literatur ein und leiten auf Basis unserer Ergebnisse praktische Implikationen für eine bessere Etablierung von HR Analytics ab. Außerdem diskutieren wir das Potenzial der Arbeits- und Organisationspsychologie, das schnell wachsende Feld von HR Analytics mitzugestalten.

Schlüsselwörter HR Analytics · Umsetzungsgrad · Nutzen · Datenqualität · Kompetenzen

1 Introduction

In the contemporary landscape of organizational management, the emergence of Human Resources (HR) Analytics represents a significant trend towards data-driven decision-making within HR practices (Margherita 2022). Technological advancements have made an unprecedented volume of data accessible for analysis. The potential to extract profound insights and improve decision-making based on this data is promising (Thakral et al. 2023). In addition, it has the potential to better link HR practices to business results, as well as to an organization's strategic planning process (Suri and Lakhanpal 2022; van der Togt and Rasmussen 2017). HR Analytics is receiving significant attention as it promises companies a competitive advantage and rational decision-making (Ferrar and Green 2021). A corresponding definition of HR Analytics is: "An HR practice enabled by information technology that uses descriptive, visual and statistical analyses of data related to HR processes, human capital, organizational performance, and external economic benchmarks to establish business impact and to enable data-driven decision-making" (Marler and Boudreau 2017, p. 15). Reasons for the use of HR Analytics are more statistically-methodically oriented than theoretical. This includes a shift towards evidence-based management (McCartney and Fu 2022a), emphasizing the use of empirical evidence and data to support management decisions, as well as the necessary strengthening of organizational capabilities (Minbaeva 2017) through statistical analysis methods, such as evaluating the effectiveness of HR strategies, talent management quality, or adaptability to changing workforce requirements. Additionally, it underscores the essential resource-based view perspective (Samson and Bhanugopan 2022), which emphasizes that an organization's resources and capabilities are fundamental to its competitive advantage and necessitates analyzing how resources in the human resources domain can contribute.

While HR Analytics holds promise in enhancing organizational effectiveness through insights derived from data analysis, its actual contribution remains a subject of ongoing theoretical inquiry. At its core, HR Analytics draws from a range of theoretical frameworks, including Human Capital Theory (Minbaeva 2017), and Work and Organizational Psychology (Ontrup et al. 2024; Oswald et al. 2020). Human Capital Theory posits that employees' skills and knowledge are crucial assets influencing organizational performance. Investments in employee development and management are presumed to yield long-term benefits. Similarly, Work and Organizational Psychology provides insights into employee behavior and motivation, suggesting avenues for improving performance and engagement. Yet, the application of psychological theories within HR Analytics is still evolving, and the extent to which they can drive meaningful organizational change remains unclear.

For addressing research questions, specific theoretical approaches are needed for understanding the relevant phenomenon at hand. For instance, Ontrup et al. (2022) argued that proactivity should be considered as a psychological construct when seeking to enhance organizational performance through data-driven means. However, the number of potentially relevant constructs is extensive, given that organizational performance is influenced by numerous factors, and there exist various theoretical approaches to predict organizational performance.

In reviews of research on HR Analytics, theoretical approaches are not typically emphasized; instead, clas-

sifications are proposed (e.g., Bonilla-Chaves and Palos-Sánchez 2023). Margherita (2022) categorizes HR Analytics research into enablers, applications, and value, while Thakral et al. (2023) further breaks them down into HR functions, statistical techniques, organizational outcomes, and employee characteristics. The application fields of HR Analytics are broad (Ontrup et al. 2024) and include: (1) performance and compensation management, (2) employee deployment and planning, (3) recruitment and onboarding, (4) health promotion and health early warning systems, (5) employee retention, (6) personnel and management development, and (7) workplace and work design.

Overall, while it is important to remember that HR Analytics is an emerging innovation with as-yet unknown consequences, current research tends to cast it in a positive light (Tursunbayeva et al. 2021) and the dark side of HR Analytics is predominantly overlooked (Giermindl et al. 2022). Accordingly, the literature identifies various advantages and potential: HR Analytics leads to better real time data availability and can enable executives to make faster, better informed decisions (Guenole et al. 2017). The focus on data and the use of analytics in the decision making process also offers the opportunity to enhance organizational ethics through reducing human bias (Tursunbayeva et al. 2021). Nevertheless, potential ethical and legal risks that may arise in the collection and analysis of data need to be addressed (Edwards et al. 2022).

Although the topic is currently receiving significant attention, the data situation is much less clear in both practice and research (Edwards et al. 2022; Yoon 2021). This raises the question of the degree of implementation and the actual benefits of HR Analytics. With regard to the level of implementation of HR analytics, a distinction is often made between three maturity categories: Reporting (retrospective, descriptive), diagnosis (causal) and forecasting (predictive). With regard to the benefits of HR Analytics from the employer's perspective, despite the high hopes placed in HR Analytics, there are also increasingly critical voices (Giermindl et al. 2022; McCartney and Fu 2022b). A central weakness is a lack of high-quality empirical studies (Edwards et al. 2022; McCartney and Fu 2022a). With regard to existing models and findings from international research, it can be stated that these are still very limited (Marler and Boudreau 2017; McCartney and Fu 2022b; Peeters et al. 2020). This also applies to German-speaking countries. For example, little is known about the prevalence of HR Analytics in German organizations. Rather vague statements are made, indicating that primarily larger organizations are already implementing HR Analytics (Hammermann et al. 2022). In Switzerland, although an initial study on the prevalence of HR Analytics called the HR Tech Survey was conducted, the results were not published scientifically.

Against this background, an explorative and descriptive approach was chosen for the study to better understand the level of implementation and the benefits of HR Analytics in Switzerland. Therefore, the research questions are:

1. What is the level of implementation of HR Analytics?
2. What are the benefits of HR Analytics?

To answer these two questions, we conducted a mixed method study.

2 Goals of the study

2.1 Objective

The objective of this study is to determine the current state of HR Analytics in Switzerland. The study serves to create a factual basis and, in line with the basic idea of HR Analytics, provides evidence-based findings on the maturity of HR Analytics in Swiss companies. The present study aimed to determine the current implementation status of HR Analytics and to gain more comprehensive insights into the state of development.

2.2 Methods

The study included a survey and interviews. The survey was conducted in December 2022 and focused on establishing the following key aspects:

1. For the first research question, areas of application, purpose, data sources, and critical prerequisites.
2. For the second research question, relevance and target achievements related to HR Analytics

Concerning the *areas of application* of HR Analytics, various HR processes were queried using yes/no questions (7 possible applications were included, e.g., recruitment/onboarding). The application areas were queried with two time references: today and in the future (2–5 years). The *purpose* of HR Analytics was queried using three maturity categories: reporting (retrospective, descriptive), diagnostic (causal), and forecasting (predictive). With regard to the *data sources*, eight different aspects were queried (e.g., survey data). In the queries about the *prerequisites* for HR Analytics, ten aspects were assessed on a 4-point scale, ranging from "not given at all" to "fully given" (e.g., high data quality). Regarding the *relevance* and *target achievement* of seven different objectives related to HR Analytics were evaluated (e.g., increase productivity).

The sample recruitment was conducted through social media. As a result, companies that have positive attitudes towards HR Analytics or are already using HR Analytics were more likely to be addressed. The survey was con-

ducted in German, French and English. The participants were asked for their informed consent. If interested, respondents were sent a results report, otherwise there were no further incentives. One hundred and thirty-three companies participated in the survey, and the results generally refer to this sample size of $N = 133$. A few results are based on partial samples, as specific questions were only asked if the preceding question was answered affirmatively (e.g., asking about the benefits of HR Analytics for a specific objective only if that objective is pursued by the company). With regard to the size of the company, the responses come predominantly from large companies. Of the companies surveyed, 85% have more than 250 employees. The majority of participating companies come from the finance and insurance sector, as well as logistics, transport and the public sector (50%). Most of the participants are HR representatives (67%). Half of the companies surveyed have their own HR Analytics function, which in the majority of cases (90%) is located in HR. In terms of resources, about half of the companies have at least 1 FTE (full time equivalent) available for HR Analytics (regardless of whether there is a dedicated analytics function or not).

Based on the quantitative study, 12 interviews were carried out with HR Analytics experts from the quantitative survey in January and February 2023. The aim of the interviews was to further explore the most important findings of the study with regard to the level of implementation and the benefits of HR Analytics, The experts interviewed represent seven distinct business sectors. The vast majority works for a large company. It was a semi-structured interview with an average duration of one hour. The interview guide was characterized by a framework of questions that still left room for situational inquiries and flanking questions (Flick 2022). The questions were related to the level of implementation and measures to improve the implementation status as well as potentially value adding topics and ways to optimize the impact of HR Analytics.

Based on the seven steps of content analysis according to Kuckartz (2014), we analyzed 12 interviews. The aim of this specific form of qualitative content analysis was to filter out certain aspects from the material in a structured way (Mayring 2015). This method of analysis is suitable for the study of the data material at hand, because the categories can be developed through an inductive approach (Kuckartz 2014). One interviewer coded the 12 interviews using multiple coding, resulting in a first version of a category system. A second member of the research team individually coded the 12 interviews to refine the coding scheme and to generate additional codes. In a final meeting, interviews that still did not fit into the system due to irregularities or unusual features were discussed and ultimately coded. This coding process resulted in a category system consisting of two themes and 12 subthemes in line with the two research questions.

3 Results of the study

In the following, we first present the quantitative results of the survey (3.1) followed by the qualitative results of the interviews (3.2). The results are organized around the two research questions.

3.1 Quantitative results

3.1.1 Question 1: What is the level of implementation of HR analytics?

When asked about the most important *prerequisites* for HR Analytics, the primary concern is data quality (see Fig. 1). Companies do not have enough time to build up a clean database. Only 33% of the respondents indicate that this prerequisite is rather or fully met. Therefore, the quality of the data suffers as a result (45% have a rather low and insufficient data quality). The preparation of data and the linking of different data sources also seems to be a challenge, with 57% of the companies feeling somewhat unable or not at all able to do so. The surveyed companies encountered fewer challenges with data protection. This result may be somewhat surprising due to the topicality of the issue. Perhaps some companies have not yet progressed enough to need to solve data protection problems. In addition, a clear, shared understanding of how analytics can add value within the organization, the right software and tools, and a general increase in analytics expertise within the organization are other important prerequisites, which need to be improved for achieving the full benefits of HR Analytics in the future.

The participants were also asked about the *fields of application* of HR Analytics (see Fig. 2). Currently, HR Analytics is used in a number of HR processes. A solid majority (61%) of respondents currently have analytics in place for their performance and compensation management. Workforce planning and recruiting/onboarding are the other processes in which more than 50% of the respondents use HR Analytics. The topic of workplace design ranked last, with only 14%. A look into the future shows optimistic assessments across all HR processes. Most respondents agree: HR Analytics will be increasingly used in the next 2 to 5 years. We conclude from this that HR Analytics seems to be on the rise.

In addition, the survey asked about the *purpose* of HR Analytics. A distinction was made between the development stages of reporting (retrospective/descriptive), diagnosis (insight, focusing on correlations, mechanisms of action), and forecasting (forward-looking). Only companies

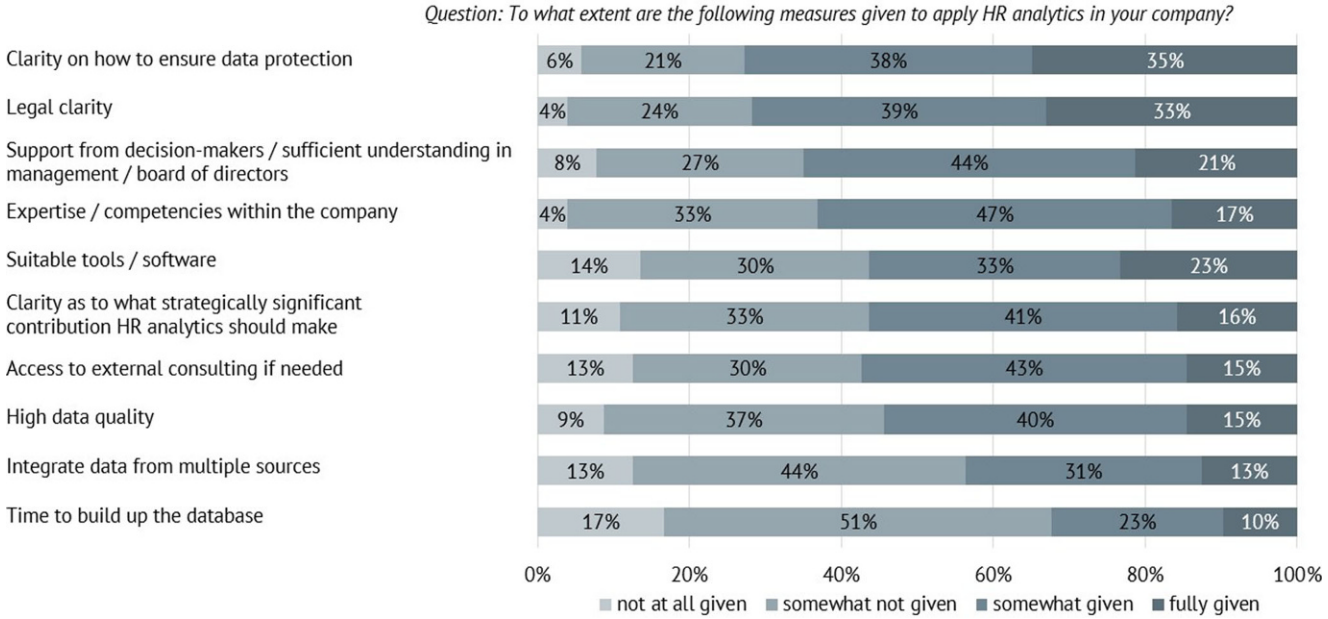

Fig. 1 Prerequisites for HR Analytics ($N = 133$)

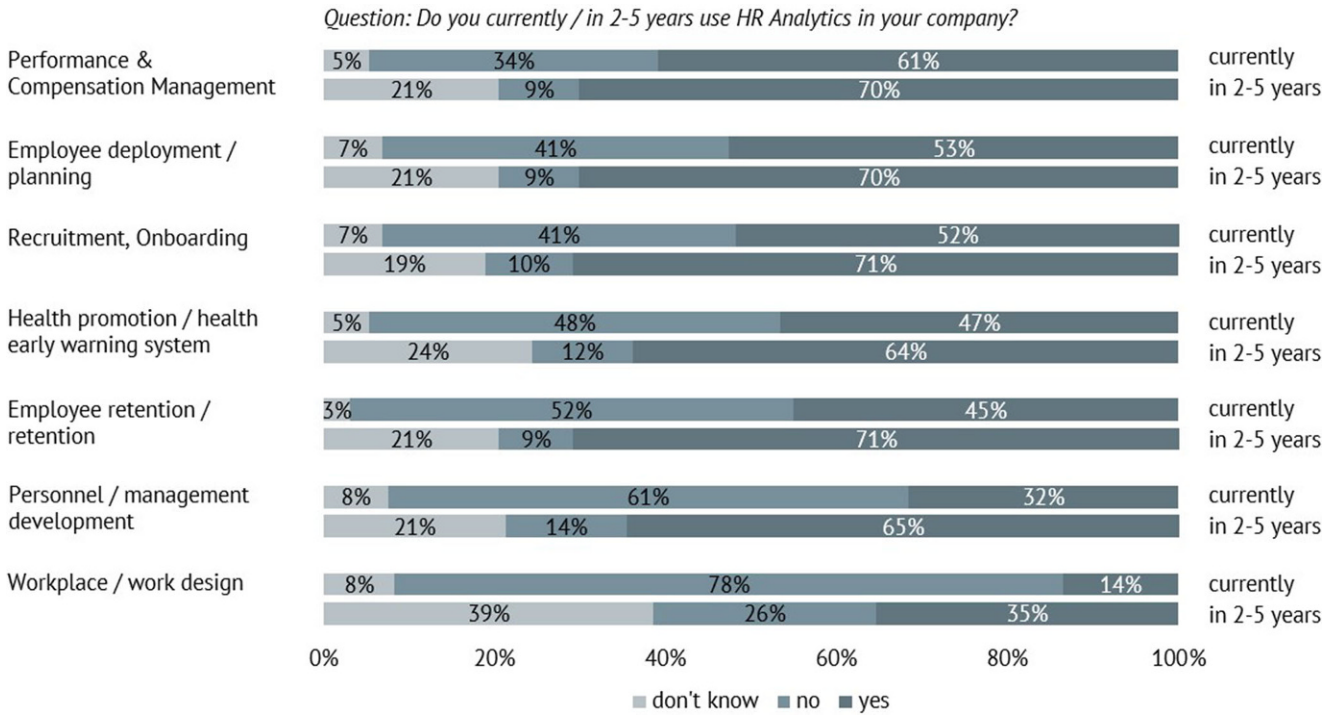

Fig. 2 Fiels of application of HR Analytics ($N = 133$)

that reported using some form of HR Analytics currently or within the next 2–5 years in response to the previous question are included in the results below. For current use, the number of responses varied from $N = 18$ to $N = 81$ across all HR processes. In response to the question of future use, the number of responses varied from $N = 44$ to $N = 87$. Those who *currently* use HR Analytics still do so more retrospectively/descriptively in the sense of reporting, but also to a considerable extent in the sense of diagnosis, that is, to understand relationships and mechanisms of action. Reporting is widely used across all HR processes. It is most commonly used in recruiting (90%) and performance/compensation management (89%). By comparison, the respondents use analytics in the sense of analysis primarily for performance/compensation management (68%) and employee retention (68%). Respondents indicated that forecasting is currently

most commonly used today for workforce planning (38%) and employee retention (32%). Over the next 2–5 years, respondents expect to see a significant increase in the use of analytics in these areas (workforce planning 63%, employee retention 68%), as well as across all HR processes. HR Analytics thus seems to be a topic on the agenda among companies. An increasing implementation level of HR Analytics in the sense of reporting towards forecasting and optimization seems to be emerging.

When asked about the *data sources* used, the responses revealed that HR data (90%) and survey data (82%) most frequently form the basis ($N = 133$). Also, employee evaluation data (61%) is a common data source for analytics. It is interesting to note that in addition to HR data, other internal/external, partly objective data sources are also regularly used. It is not clear from the answers whether data sets are linked to other data sets, and if so, which; for example, more could be done with labor market/customer data, as this is now available. On the other hand, the use of competitor data remains at a marginal level (24%).

Finally, the responses indicate that the implementation of HR Analytics varies depending on the *size of the company*. Not only was there a difference in the level of HR Analytics implementation, but also in the availability of human resources. Larger companies see to be more likely to have a dedicated HR Analytics function. However, the relation between company size and the degree of implementation of HR Analytics merely describes tendencies. It should be noted that due to the sample size, no statements on statistical significance can be made.

In summary, these results from the surveyed companies help us better understand the current state of HR Analytics implementation. Most companies still face serious challenges regarding the prerequisites for analytics and are not yet at the desired level. Attention to the topic is high, and companies are working through the various challenges with the goal of significantly increasing their analytics activities over the next five years. The shift from purely descriptive work to a more analytical approach focusing on correlations and forecasting is typical. Forecasting will no longer be limited to specific processes such as workforce planning and employee retention but will be an integral part of all HR processes.

3.1.2 Question 2: What are the benefits of HR analytics?

Participants were further asked about the *relevance of different targets*. This question was only asked of companies that use HR Analytics, so the number of responses varies between 69 and 113. Increasing employee satisfaction and engagement was cited by over 90% as relevant to the use of HR analytics. Another target of HR Analytics is to improve recruitment and reduce turnover (84%). Moreover, a number of other targets are also pursued with HR Analytics. These include reducing employee turnover (79%), promoting competency development (79%), and reducing sick leave (73%). However, when asked to what extent HR Analytics has brought *clear benefits* in terms of target achievements, there is a clear discrepancy between claim (relevance of the target) and reality (achievement of the target). In fact,

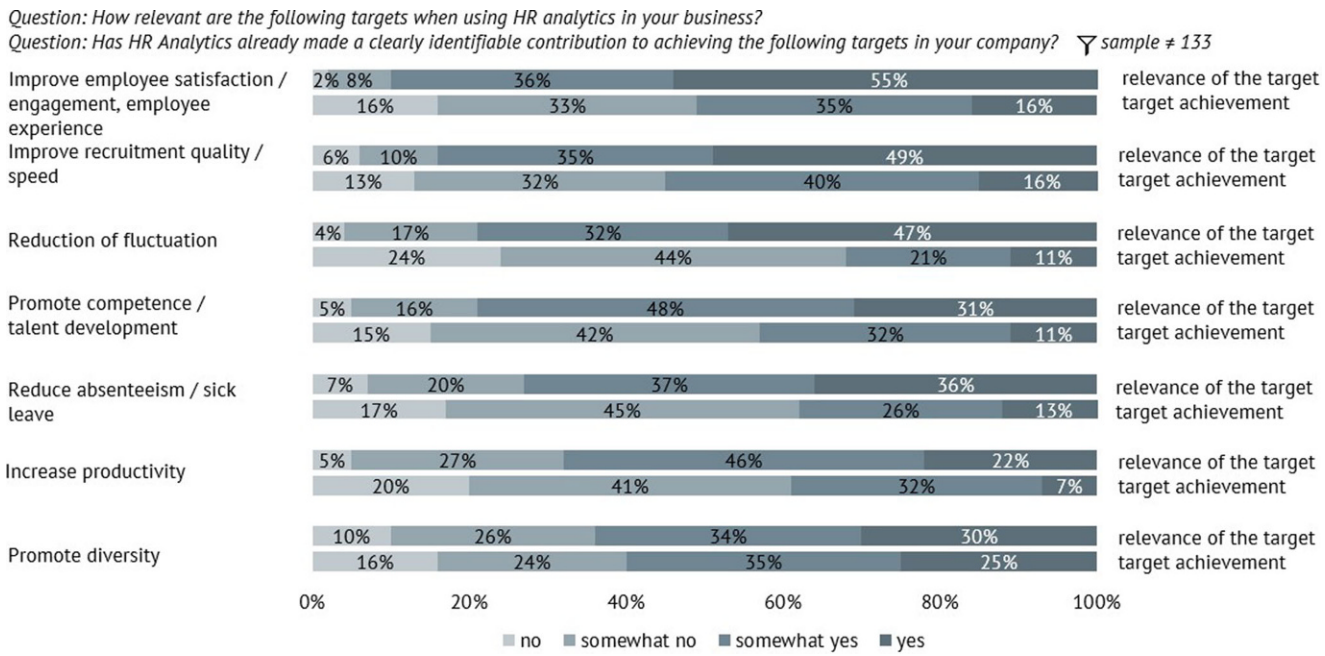

Fig. 3 Target relevance vs. target achievement of HR Analytics ($N = 69$–113)

the discrepancy between target relevance and achievement assessment runs through all targets (see Fig. 3).

The results of the survey show, moreover, that HR Analytics is still primarily used as a diagnostic tool. Only around 50% of the companies are using HR Analytics to derive measures. Of those, only one in two (55%), in turn, evaluates the impact of the measures implemented. It seems that some of the lack of effectiveness of HR Analyses is due to the fact that few actions follow from the insights gained.

In summary, the results help explain the benefits of HR Analytics and what still needs to be done to achieve them. The discrepancy between the reported relevance of HR Analytics and the perceived target achievements indicates that there is still considerable progress to be made. The fact that only half of companies systematically derive actions, and just slightly more than one in four track and evaluate the outcomes of actions, confirms that not all potential benefits are being achieved. Therefore, it is essential to enhance analytical skills and clearly articulate the business value to ensure that the expected benefits are achieved across all HR processes in the near future.

3.2 Qualitative results

3.2.1 Question 1: What is the level of implementation of HR analytics?

With regard to the *level of implementation* of HR analytics, the interviews showed, in line with the study, that a largely descriptive, backward-looking description is in the foreground across all HR processes (see Table 1).

The interview subjects were asked how the implementation level of HR analytics could be improved. The respondents answered that *use cases* are important to better target HR Analytics. This also includes a better understanding of existing HR Analytics tools and their cost-benefit ratio.

From the responses it also became clear that a certain *competence profile* is required for the further development of HR Analytics. This includes not only the ability to analyze and interpret data, but also the ability to translate the results into effective action. In addition to statistical skills this also includes social science and communication skills in particular. The ability to translate data science into the language of the addressees was described as crucial for success. This combination of competences is rarely united in one person.

In terms of *data quality*, the interviews yielded similar results to the survey: Data quality is one of the biggest challenges for the further development of HR Analytics, even ahead of data protection. It was pointed out that data is often available, but it is difficult to prepare it in a way that it can be used. There is often too little time to build up a good database. Furthermore, linking different data sources with each other is a challenge.

Overall, the answer to question 1 is that the level of implementation of HR Analytics is moderate. Looking to the future, the use of more analysis and forecasting is expected.

3.2.2 Question 2: What are the benefits of HR analytics?

The interview subjects were asked which topics from the field of HR analytics would bring them the greatest added value from today's perspective. The *shortage of skilled workers* was mentioned most frequently (see Table 2). In line with this, recruitment and employee retention were named as two important fields of application for HR Analytics in the study. The quantitative study also reveals that the largest gap between expected and actual achievements exists in recruitment. When asked about the shortage of skilled workers, respondents in the interviews stated that it is becoming increasingly difficult to find and retain staff. In addition, it was pointed out that there is a new importance to the analysis of existing fluctuation. The interviewees

Table 1 Themes, codes and illustrative quotes related to research question 1

Themes	Subthemes/Codes	Illustrative quotes
Level of implementation	Descriptive approach (9)	"It's all just pointing out status quo and comparing with the past."
		"When it comes to recruitment, we don't do anything. We've always been reactive. If someone quits, then we look for someone again."
	Diagnostic approach (5)	"We are at most in the diagnostic stage. For example, in the case of sick leave, we do situational work where there is a high level of sick leave. We get to the bottom of it more."
	Predictive approach (3)	"Our dashboard has an element to use the workforce survey data and we do mainly structural equations or a multilinear regression and you can do a sensitivity analysis."
		"For retention, we have projections if there could be a risk (risk, action and so if you do that action, what percentage does the retention risk go down)."
Improvement of implementation	Use cases (9)	"Use cases: Practical use cases and limitations of analytics. Link to business issues"
	Competency (5)	"Data literacy, team expertise and time to build the competencies."
	Data quality (4)	"The quality of our master data is not pronounced."

Table 2 Themes, codes and illustrative quotes related to research question 2

Themes	Subthemes/Codes	Illustrative quotes
Added value benefits	Shortage of skilled workers (18)	"The biggest issue is shortage of skilled workers. We are not getting well qualified applications. Sound evaluation for the BoD. (e.g., look the number may seem small, but the consequences for business are big)."
		"Skilled labor shortage—that's where we're going to be extremely challenged right now. Being able to retain the employees you have."
	Health (11)	"First and foremost, the health of our employees is very important. For example, we have held an experience group on long-term absences and how to deal with them."
		"I think we need to find the right way in the post-pandemic. In principle, how to work together, where to exchange information. Setting the framework. Where are the boundaries in terms of wellbeing, so that productivity does not lead to burnout."
Optimization of impact	Storytelling (6)	"Analysis interpretation skills is one of the biggest problems, we also need to learn how to communicate and understand data."
	Data culture and protection (4)	"At the level of overall management and HR management, there is no awareness yet."
		"On the first of September, the Data Protection Act is coming. I don't think there's any awareness yet of the impact it will have."
	Business value (4)	"Impact on business, business relevance"
	Collaboration with line managers (4)	"Good stakeholder management with the line is a key success factor"
	Legitimacy (3)	"I then have the data, but I have no mandate and no standing with the line managers so that I can convince them of the relevance of the data. Accordingly, they do not listen to the issue."

confirmed that we are not dealing with a shortage of skilled workers, but a labor shortage in general. The shortage of skilled workers is therefore not only evident in the white-collar sector, but at least as much in the blue-collar sector. HR Analytics can help address the skills shortage, for example through improved HR processes, employee retention, and better identification and allocation of resources.

Health was mentioned as another current topic in the field of HR analytics that could bring added value. The study had already highlighted health as a frequent area of focus, indicating that health promotion is a relatively high-priority aspect of HR Analytics in both current and future use. Specifically, respondents mentioned that the design of mobile-flexible work and the prediction of illness cases are gaining significance in the context of health. When asked for further details, HR Analytics experts emphasized that resource, time, and boundary management have become more critical in the new world of work. Additionally, respondents indicated that constant accessibility in the context of home office or hybrid work may lead to perpetual distractions, insufficient recovery time and unclear boundaries between work and private life (e.g., presentism). Respondents underscored that workplace health management needs to be redefined, and the employer's duty of care is taking on a new meaning.

When asked about further measures to optimize the *impact* of HR Analytics, further ability to communicate and translate findings was an aspect particularly emphasized during the interviews. The study revealed a consistent theme concerning *storytelling*. Storytelling, framing, contextualization, selling, and interpretation, as well as translating insights into the language of the audience, were identified as success factors of HR Analytics in companies.

Furthermore, the interviews highlighted the importance of a *data culture and data protection, business value, collaboration with the line managers* as well as *legitimization* of HR Analytics within the organization to further optimize the impact of HR analytics. Successful HR Analytics requires a profound understanding of the client's work, close cooperation with line managers and the ability to demonstrate the influence on key business figures and thus business value.

Overall, HR Analytics is currently seen to be particularly beneficial for two topics by the interviewees: shortage of skilled workers and health. Storytelling, data culture/protection, business value, collaboration with line managers, and legitimacy seem to be especially necessary to further increase the impact of HR Analytics.

4 Discussion

4.1 Question 1: What is the level of implementation of HR analytics?

In terms of the level of implementation of HR Analytics, there still seems to be a lot of potential to move from backward-looking data analysis to forward-looking impact analysis. The foundation and one of the most important prerequisites for all analytical activities is a solid and reliable data base that connects different data sources. Today, most companies lack the time, systems, and skills to build such an interconnected data foundation (Belizón and Kieran 2022; Fu et al. 2023; Margherita 2022). It is criti-

cal that companies invest their time and resources thoughtfully and selectively when creating the data foundation and processes that allow for its maintainability and scalability. According to Levenson and Fink (2017), people who are not trained and experienced in data science can get distracted in the pursuit of perfectly clean data before starting the analysis. It is important to understand that data is never perfectly clean and to know when the point of diminishing returns is reached. In addition, companies are still primarily focused on incrementally improving existing business processes to gain efficiency through reporting and backward-looking data analysis, but still fall short when it comes to actually using forward-looking analytics to address the underlying problems and solve them in a new way (Levenson and Fink 2017).

In line with our findings, a more selective and targeted approach to HR Analytics with a clear focus on specific use cases is recommended. A better alignment of analytics activities and the use case linked to a strategic business decision help to navigate through the vast amount of data and insights that are interesting to know but not directly relevant to the use case (Levenson and Fink 2017). With a consistent focus on strategic use cases, the focus of HR Analytics will continue to shift towards a more future-oriented approach.

Additionally, a specific skill profile is required to ensure that data insights can be interpreted and fully communicated to decision makers. As the results show, the necessary analytical and interpretive skills need to be developed throughout the organization. The lack of these skills within HR, along with a lack of business understanding and a general reluctance to take action on numbers, is evident in other research as well (Angrave et al. 2016; Dahlbom et al. 2019). Some statements in the interviews show that the managers are overwhelmed by the evaluations or dashboards, interpreting them, and deriving measures from their output. To move from insights to action and to improve HR Analytics legitimacy, the literature has suggested a joint approach in which data analysts, HR professionals, line managers, and decision makers work closely together (Belizón and Kieran 2022; Ferrar and Green 2021).

4.2 Question 2: What are the benefits of HR analytics?

The potentially most striking finding of the quantitative study is the enormous discrepancy between the aspirations and the reality of HR Analytics. How can the discrepancy be explained? The lack of implementation and evaluation of measures seems to be an important starting point.

Only one-fourth of the companies surveyed both derive action from their analysis and track progress. One of the main reasons for this seems to be insufficient translation of the insights into the language of decision makers and the ability to sell the business value (Fu et al. 2023). These skills therefore need to be developed further in additional training sessions.

The hopes and anticipated benefits of HR Analytics are particularly high when it comes to addressing labor shortages (Momin and Mishra 2015). The interviews revealed that the shortage of skilled workers is perceived in different ways. Most commonly, it is understood as the challenge of finding applicants with the required qualifications. However, the interviewees' responses indicated that the shortage of skilled workers must be defined in a company-specific manner. For instance, some respondents mentioned that the lack of skilled workers in their company was more of a turnover issue than a recruitment problem. Therefore, retention and recruitment are two specific processes where HR analytics is expected to be advantageous, and further research should be conducted to understand how to achieve positive impact in these areas. Other studies also highlight the significance of this research gap (McCartney and Fu 2022b).

The other area where HR analytics is expected to have a positive impact is in health promotion. The importance of this topic is steadily increasing. In particular, the prediction of illness cases and the organization of mobile and flexible work are becoming more and more crucial (Belizón and Kieran 2022; Lawrance et al. 2021). On the other hand, the findings suggest that workplace design is still a minor focus for the use of analytics, indicating room for improvement. Therefore, a more systematic analysis of these data and the derivation of concrete measures to enhance workplace design, especially in the context of mobile and hybrid work, is recommended. HR Analytics also holds the potential to foster employee engagement and contribute to employee health as an early warning system. However, it is essential to address ethical and privacy concerns when dealing with data related to employee health (Giermindl et al. 2022; Tursunbayeva et al. 2021). In general, different national legal requirements must be taken into account to implement HR analytics.

As discussed, a number of factors need to be improved to close the gap between the aspirations and reality of HR analytics, which is also confirmed by other studies (Shet et al. 2021). A combination of improved skills, better data quality, more interdisciplinary collaboration, and a stronger link to specific business cases will facilitate further adoption. Specifically, this means that the successful implementation of HR analytics requires expertise in data literacy, interpretation and storytelling. Data literacy is not just about data modelling and data quality, but also about data protection and compliance. Successful interpretation and storytelling requires an understanding of the business and the ability to communicate complex issues in a simple way in order to demonstrate the costs and added value of possible measures.

Finally, to monetise the benefits of HR analytics, measuring the impact of the actions taken should not be neglected.

Also, to achieve greater practical impact and better leverage HR Analytics, it is necessary to develop more theory-based impact models (McCartney and Fu 2022a). Specifically, it is important to have a better understanding of how and when HR Analytics can add value to an organization and to link business needs more closely with scientific rigor (Ontrup et al. 2023; Parker and Grote 2022).

5 Practical implications

Work and Organizational Psychology can make relevant contributions to the establishment of HR analytics. In this section, against the background of the study results we discuss the possibilities for optimizing HR a\nalytics by work and organizational psychologists.

One of the most immediate barriers to realizing the full potential of HR Analytics in organizations is the lack of analytical and interpretive skills. In addition, the ability to graphically present results and translate abstract data and models into practical measures are core competencies in demand. Here, the work and organizational psychologist can provide these skills as well as a broad range of statistical and methodical competencies. Work and organizational psychologists should also have the competence to initiate and accompany implementation measures and thus act as multipliers for the findings from HR Analytics. In addition to managers, HR consultants and HR business partners may also need support in interpreting the data and deriving measures. In general, it is advisable to combine insights from Industrial and Organizational Psychology, Human Resources, and Organizational Behavior to successfully implement HR Analytics.

Further, data analysts, HR professionals, and decision makers need a more interdisciplinary way of working together to make sure tangible measures follow the analysis (Ferrar and Green 2021). Interdisciplinary collaboration and stakeholder management are key success factors for the successful introduction of HR analytics. Work and organizational psychologists with skills in empathy, storytelling, and stakeholder management should be able to make a special contribution here to building bridges to the line and the decision makers: Intertwiners that build bridges between hierarchies and organizational units are of great practical importance for successful HR analytics.

Finally, HR Analytics is seen by respondents as having great potential to improve the employee experience of HR processes and products. This represents an opportunity for HR and work and organizational psychologists in particular to optimize the customer experience with insights from HR Analytics and methods of human-centered design, and to add more perceived value to organizations in general (Ferrar and Green 2021).

Overall, there is still a great need for more substantial and scientific research in the field of HR Analytics. In particular, a better understanding of how disruptive technologies such as HR Analytics can be integrated with traditional HRM practices and how they can be better aligned with overall business goals should be a focus of further research (Edwards et al. 2022; Margherita 2022; Thakral et al. 2023).

6 Limitations

One major limitation is the non-representativeness of the participants in terms of the number of participants, company sizes, and industries represented. The sample was solely focused on Swiss companies and predominantly on German-speaking companies. It should be noted that culture and language as contextual factors have an influence on the acceptance of HR analytics. In addition, most of the participants were HR professionals or C-level executives. The absence of input from technical experts, such as IT professionals and data analysts, may have resulted in an incomplete understanding of the technical challenges. This may affect the interpretation of what the specific current challenges are and in what timeframe the expected progress can be achieved. Overall, researchers should exercise caution when attempting to generalize the results beyond the specific constraints of this study. Future research should address these limitations through the inclusion of diverse participant samples, the consideration of different regions and linguistic contexts, and the inclusion of technical experts for a more comprehensive understanding.

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References

Angrave, D., Charlwood, A., Kirkpatrick, I., Lawrence, M., & Stuart, M. (2016). HR and analytics: Why HR is set to fail the big data challenge. *Human Resource Management Journal*, *26*(1), 1–11. https://doi.org/10.1111/1748-8583.12090.

Belizón, M. J., & Kieran, S. (2022). Human resources analytics: a legitimacy process. *Human Resource Management Journal*, *32*(3), 603–630. https://doi.org/10.1111/1748-8583.12417.

Bonilla-Chaves, E. F., & Palos-Sánchez, P. R. (2023). Exploring the evolution of human resource analytics: a bibliometric study. *Behavioral Sciences*, *13*(3), 244.

Dahlbom, P., Siikanen, N., Sajasalo, P., & Jarvenpää, M. (2019). Big data and HR analytics in the digital era. *Baltic Journal of Management*, *15*(1), 120–138. https://doi.org/10.1108/BJM-11-2018-0393.

Edwards, M. R., Charlwood, A., Guenole, N., & Marler, J. (2022). HR analytics: an emerging field finding its place in the world alongside simmering ethical challenges. *Human Resource Management Journal*.

Ferrar, J., & Green, D. (2021). *Excellence in people analytics: how to use Workforce data to create business value*. Kogan Page Publishers.

Flick, U. (2022). *An introduction to qualitative research* (pp. 1–100).

Fu, N., Keegan, A., & McCartney, S. (2023). The duality of HR analysts' storytelling: showcasing and curbing. *Human Resource Management Journal*, *33*(2), 261–286.

Giermindl, L. M., Strich, F., Christ, O., Leicht-Deobald, U., & Redzepi, A. (2022). The dark sides of people analytics: reviewing the perils for organisations and employees. *European Journal of Information Systems*, *31*(3), 410–435.

Guenole, N., Ferrar, J., & Feinzig, S. (2017). *The power of people: learn how successful organizations use workforce analytics to improve business performance*. FT Press.

Hammermann, A., Lehr, J., & Burstedde, A. (2022). *HR Analytics: Anwendungsfelder und Erfolgsfaktoren*. IW-Report 28/2022. Köln: Institut der deutschen Wirtschaft Köln e. V..

Kuckartz, U. (2014). *Qualitative Inhaltsanalyse. Methoden, Praxis, Computerunterstützung* (2nd edn.). Weinheim, Basel: Beltz Juventa.

Lawrance, N., Petrides, G., & Guerry, M.-A. (2021). Predicting employee absenteeism for cost effective interventions. *Decision Support Systems*, *147*, 113539.

Levenson, A., & Fink, A. (2017). Human capital analytics: too much data and analysis, not enough models and business insights. *Journal of Organizational Effectiveness: People and Performance*, *4*(2), 145–156. https://doi.org/10.1108/JOEPP-03-2017-0029.

Margherita, A. (2022). Human resources analytics: a systematization of research topics and directions for future research. *Human Resource Management Review*, *32*(2), 100795. https://doi.org/10.1016/j.hrmr.2020.100795.

Marler, J. H., & Boudreau, J. W. (2017). An evidence-based review of HR Analytics. *The International Journal of Human Resource Management*, *28*(1), 3–26.

Mayring, P. (2015). *Qualitative Inhaltsanalyse. Grundlagen und Techniken* (p. 4, 58). Weinheim: Beltz.

McCartney, S., & Fu, N. (2022a). Bridging the gap: why, how and when HR analytics can impact organizational performance. *Management Decision*, *60*(13), 25–47. https://doi.org/10.1108/MD-12-2020-1581.

McCartney, S., & Fu, N. (2022b). Promise versus reality: a systematic review of the ongoing debates in people analytics. *Journal of Organizational Effectiveness: People and Performance*, *9*(2), 281–311.

Minbaeva, D. B. (2017). Building credible human capital analytics for organizational competitive advantage. *Human Resource Management*, *57*(3), 701–713.

Momin, W. Y. M., & Mishra, K. (2015). HR analytics as a strategic workforce planning. *International Journal of Applied Research*, *1*(4), 258–260.

Ontrup, G., Schempp, P. S., & Kluge, A. (2022). Choosing the right (HR) metrics: digital data for capturing team proactivity and determinants of content validity. *Journal of Organizational Effectiveness: People and Performance*, *9*(2), 212–232.

Ontrup, G., Moeschke, J., Buechsenschuss, R., & Biemann, T. (2023). When to think like a scientist. *Zeitschrift für Arbeits- und Organisationspsychologie A&O*. https://doi.org/10.1026/0932-4089/a000418.

Ontrup, G., Hagemann, V., & Kluge, A. (2024). *HR-Analytics. Eine Einführung in ganzheitliches, datengestütztes Personalmanagement*. Göttingen: Hogrefe.

Oswald, F. L., Behrend, T. S., Putka, D. J., & Sinar, E. (2020). Big data in industrial-organizational psychology and human resource management: Forward progress for organizational research and practice. *Annual Review of Organizational Psychology and Organizational Behavior*, *7*, 505–533.

Parker, S. K., & Grote, G. (2022). Automation, algorithms, and beyond: why work design matters more than ever in a digital world. *Applied Psychology*, *71*(4), 1171–1204. https://doi.org/10.1111/apps.12241.

Peeters, T., Paauwe, J., & Van De Voorde, K. (2020). People analytics effectiveness: developing a framework. *Journal of Organizational Effectiveness: People and Performance*, *7*(2), 203–219.

Samson, K., & Bhanugopan, R. (2022). Strategic human capital analytics and organisation performance: the mediating effects of managerial decision-making. *Journal of Business Research*, *144*, 637–649.

Shet, S. V., Poddar, T., Wamba Samuel, F., & Dwivedi, Y. K. (2021). Examining the determinants of successful adoption of data analytics in human resource management—A framework for implications. *Journal of Business Research*, *131*, 311–326. https://doi.org/10.1016/j.jbusres.2021.03.054.

Suri, N., & Lakhanpal, P. (2022). People analytics enabling HR strategic partnership: a review. *South Asian Journal of Human Resources Management*. https://doi.org/10.1177/23220937221119599.

Thakral, P., Srivastava, P. R., Dash, S. S., Jasimuddin, S. M., & Zhang, Z. (2023). Trends in the thematic landscape of HR analytics research: A structural topic modeling approach. *Management Decision*, *61*(12), 3665–3690.

van der Togt, J., & Rasmussen, T. H. (2017). Toward evidence-based HR. *Journal of Organizational Effectiveness: People and Performance*, *4*(2), 127–132. https://doi.org/10.1108/JOEPP-02-2017-0013.

Tursunbayeva, A., Pagliari, C., Di, L. S., & Antonelli, G. (2021). The ethics of people analytics: risks, opportunities and recommendations. *Personnel Review*, *51*(3), 900–921. https://doi.org/10.1108/PR-12-2019-0680.

Yoon, S. W. (2021). Explosion of people analytics, machine learning, and human resource technologies: Implications and applications for research. *Human resource development quarterly*, *32*(3), 243–250.

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