

Digital Human Resource Management - Designing a digital platform for educational institutions' HR process

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Abstract. *Human resource management (HRM) systems have been of interest in research for many years, with a slightly difference in frequency in two waves. With technology development new opportunities to harvest value from introducing digital platforms have arisen. This paper addresses the role of digital HRM platforms by presenting a case study of designing a conceptual architecture model of an HR digital platform for educational institutions, more specifically for supporting the process of assessment and promotion of teachers in primary and secondary schools in Croatia. The case study describes starting value propositions for main actors, platform's design criteria, a conceptual model of the platform, a wireframe model illustrating technological extensions, all oriented for delivering the set value propositions. The case study shows that an integrated HR platform designed in such a manner, would be able to meet the value proposition of supporting the described process, and provide better collaboration options of involved stakeholders.*

Keywords. HRM, platforms, promotion, schools

1 Introduction

Human Resource Management encompasses different perspectives of managing employees and their role in an organization. It is based on data covering: a) administration (i.e. personal data, contract data, demographic data, academic data, previous work experience and similar), b) interrelations (like social interaction, team working, collaboration, and interpersonal relationships (Skinner, 1981)), c) stages of a work-lifecycle (like recruitment, selecting, training, onboarding, promotion, rewarding and assessment, orientation, (re)placement (Sukawati et al., 2020), retirement, resignation), d) skills and competencies (from vocational, professional, technology-related, industry-related, digital), e) performance and operational activities related to specific work positions. Basic classification of the HR

data is into master data collected and used as common registries in integrated environments, and transactional data capturing interactions and performance.

With technology development, existing traditional use of HRM systems is offering new design features for supporting specific organizational needs in HR management. Some examples of applying technology in HRM systems can be found in applying IoT and cloud computing (Chai, 2022), Big data technology in human resource management for supporting decision making for employee-job matching (Chen & Du, 2022) or based on fuzzy data mining for different stages of HR Management (Peng, 2022), and they show that this topic gains value as more data on employees is available.

Social media platforms are another example of extending the insights into traditional HRM, introducing professional social media (PSM), and emergent themes, and subsequently, related research questions (Ruparel et al., 2020).

With social disruptions and developments other challenges arise as well. The phenomena of short-term and temporary positions, independent workers, flexibility in time and space management of jobs, gig economy, remote work, digital nomads and other, offer new paradigms of managing HR. As a response to these challenges, platform-based tools are being introduced.

HRM activities in platform ecosystems enable new roles and contributions of key actors in ensuring value co-creation (Meijerink & Keegan, 2019), aligning thereby multilateral exchanges of three key economy actors: gig workers, requesters, and intermediary platform firms, for ensuring value co-creation. Although there is a need to critically examine the role of HRM (Kaufman, 2020) or platforms (especially management-by-algorithm in gig economy forms of introducing platforms (Duggan et al., 2020)) there is still space for improving existing HRM systems.

Human resource management systems created either as simple applications or as complex platforms should support organizations and employees to actively participate in achieving set goals and improve

the quality of services as an opportunity to advance, both collectively and individually. In many cases teachers and other employees in education are missing a proper digital platform which would support them in tracking their achievements in their Carrier Lifecycle. This impacts their administrative workload heavily. Generic design criteria for digital platforms can be translated into specific functional requirements addressing roles and needs of educational institutions offering to tailor custom solutions and providing thereby new value for “customers”.

A digital platform that is custom designed for creating value by minimizing the administrative burden and that is strongly in compliance with regulatory frameworks, should enable individual user experience paths, provide collaboration with other stakeholders, aim to assist the personal development as well as the development of communities within the ecosystem. The latter is the motivation for this research, namely investigating the role of platforms in supporting HRM in schools, as a part of a wider project of e-schools in Croatia.

2 Research insights about publications related to HRM and digital platforms

For the purpose of secondary data collection, desk research was conducted during April 2023, starting with the identification of publications in two relevant databases - Web of Science and Scopus. The literature review was performed based on a search using the combination of keywords “human”, “resource” and “platform” in the publication titles. The search resulted in 63 results in Scopus and 33 results in Web of Science (i.e. 96 in total), whereby 27 papers were covered by both databases, leaving 69 different papers for further analysis (listed in the Appendix I). Analysis was performed on those 69 papers, first by year, document type and source (as shown in fig. 1). This basic analysis was performed to identify main trends in this field, and the results revealed that until 2018, 31 papers were published, followed by a significant drop in 2019, and then from 2019 to 2023 additional 38 publications arose. This second set indicates that there were two waves, which can be a result of rethinking HRM in disruptive environments challenged by Covid-19 pandemic.

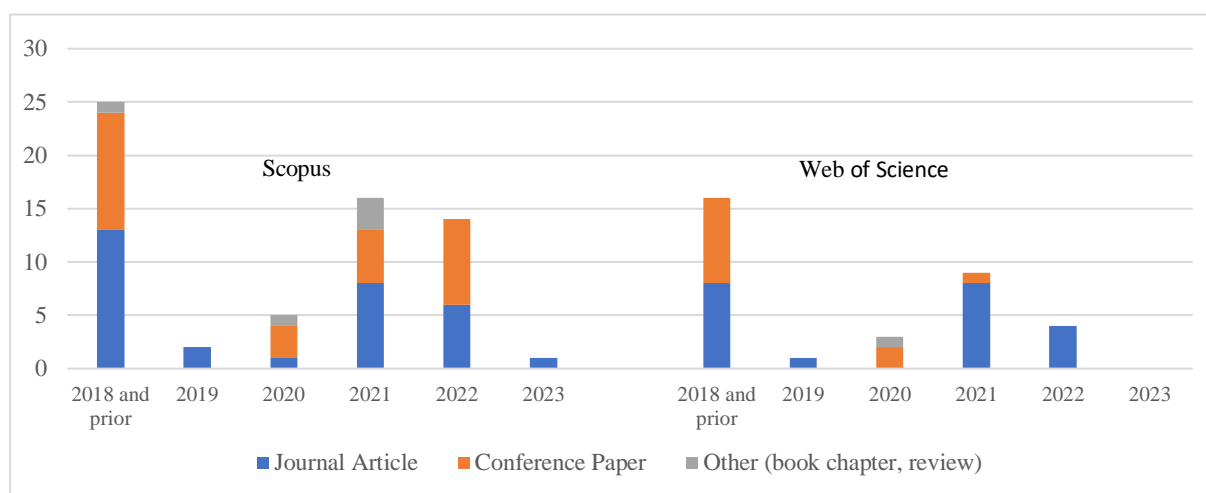


Figure 1. Publications by year, type and source

To explore the difference more in depth between these two waves, text-mining techniques were applied, for a more qualitative analysis. For the text-mining R Studio tool was used, for two runs: for papers published before and in 2018, and for papers from 2019 until 2023. The text-mining was performed on publications’ abstracts, with application of cleaning methods, both manual and automatic. Although this research is not exhaustive, and it did not include whole publication texts, some results seem to be interesting for gaining some insights.

A full list of words with appearance frequency of 10 and more for both waves is given in table 1, and respective word clouds in figures 2 and 3.

The results indicate that the pool of words doubled in the second wave (when exploring only words appearing more than 10 times). This could indicate a rise of HRM complexity, since 2019. Some words were appearing more often: human 85→128, resource 85→140, platform 49→65, management 41→88, data 19→71, technology 13→23, design 7→17.

Table 1. Words by appearance

Publications till and in 2018		Publications from 2019	
human	85	resource	140
resource	80	human	128
platform	49	management	88
management	41	data	71
information	29	platform	65
development	24	HRM	28
data	19	decision	27
service	19	development	27
system	18	information	23
technology	13	system	23
cloud	12	technology	23
evaluation	11	analysis	21
e-learning	10	research	20
network	10	results	18
research	10	design	17
science	10	network	17
		performance	17
		activities	16
		enterprise	16
		teaching	16
		application	13
		SaaS	13
		service	13
		support	13
		traditional	13
		computing	12
		model	12
		process	12
		labor	11
		method	11
		algorithm	10
		economy	10
		online	10
		processing	10
		technologies	10

The results also indicate that some new terms are entering the HRM arena (like complexity 0→10, SaaS (software as a Service) 0→13.), and some more emphasis is put on the management of resources, rather

than the human aspect. A word which did not meet the threshold of 10 and more appearances is “digital”, moving from not appearing till 2018, to 9 times in the second wave.

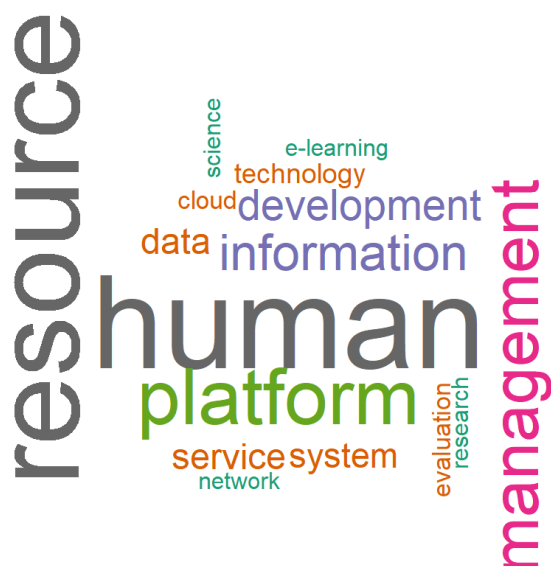


Figure 2. Wordcloud from publications till 2018 [Author’s work, using R studio]



Figure 3. Wordcloud from publications from 2019 [Author’s work, using R studio]

Based on the insights gained through the text mining, and previous research in this field, further sections of this paper are addressing the design of a HRM platform which aims supporting one important stage of HRM, the promotion stage. This specific stage is selected

because it involves many actors within the process of assessing teachers and their efforts in terms of meeting general conditions and excellence conditions related to organizing student competitions, attending educational programs, participating in professional councils and

associations, publishing teaching materials and professional papers, working on projects, improving school work and elements of the education system. For that purpose, first a conceptual architecture model of an HR digital platform for schools is presented, offering to describe design criteria based on specific factors of decision-making for using a digital platform to run the process of assessment and promotion, by relying on existing research on perspectives of joining, adopting, or implementing a digital platform. Next, to illustrate how such a platform could include certain technological elements, a wireframe illustrates how this platform could be realized in order to integrate other existing HR-related systems into a single operating platform. At the end of the paper, a discussion and concluding remarks are given.

3 A case study of designing a conceptual architecture of a digital platform for schools

A general conceptual model implying convergent or divergent relationships between various stakeholders, influencing thereby their perceived balance of value or risk and the overall decision on joining, adopting, or implementing a digital platform (Kutnjak et al., 2022) is the basis for designing the Conceptual architecture of an HR digital platform (DP) for schools. It encompasses four actors, divided into 3 roles: DP provider, DP customer, DP producer. DP provider for schools in Croatia is CARNET, a national agency for supporting schools and other academic institutions with ICT related products and services. DP customers (customers in a sense of using the platform to get assessed) are teachers in schools, performing their daily activities and consequently generating inputs for their assessment within the promotion process i.e. in their professional advancement and promotion related to their work excellence. The role of DP producers (producers of the output of the assessment and promotion process) is primarily intended for the Education and Teacher Training Agency, responsible for the assessment process in teacher promotions, but also school management involved in administrative activities within that process. Starting point for a platform design is shaping the Value proposition for stakeholders and future platform actors. The value proposition for DP customers consists of following elements:

- Having everything in place, demanding less time and effort to prepare for assessments ran in cycles or on demand;
- More experience exchange opportunities with peers within communities related to usefulness on offered activities (educational and training programs, association events, projects) delivered by DP producers and other stakeholders;

- More convenient access to data needed for planning personal achievements and more efficient options for tracking progress of achieving them.

The value proposition for DP producers consists of following elements:

- More detailed overview and insights of delivered educational and training programs, association events, projects;
- More detailed data available for planning future policies, events and activities;
- Opportunity to provide assistance and support not only at the end of an assessment cycle, but also continuously.

The value proposition for DP provider is to generate design criteria detailed enough to enable them to develop and implement a new HRP digital platform. In order to enable all actors to gain their value proposition and claim the, for them intended roles, design criteria for a future HR digital platform were designed. The design criteria have to meet specific factors of decision-making for using the platform to run the process of assessment and promotion, which is explained in the following sections. From the DP provider's perspective, factors for implementing the platform are translated into following design criteria:

- *Resource dependencies & bottlenecks:* The provider enables integration with other systems in order to ensure none or only minimum intentional redundancies, as well as easy and convenient access to the multiple services through different devices (Ojala et al., 2020).
- *Purpose and functionality dependencies:* Providers follow functional specifications to support the current process of promotion assessment, by including functionalities for different stakeholders (school management, associations for conducting the assessment and teachers) and their interaction.
- *Platform multi-layer architecture:* The resource and functionality dependencies have to be designed as an open modular multi-layered structure consisting of a stable core with modular services (Riefle et al., 2021).
- *Value creation options:* The open modular structure of the platform provides opportunities for growth and adopting new services within the ecosystem by introducing new stakeholders and their complementary services.
- *Co-provider relations across layers:* Opportunities for growth and adopting new complementary services can contribute to more inclusiveness, motivation to use and client loyalty. Connectors to social media can be a fair example of co-provider relation.
- *Access control & limitations:* Limited access and access control must be provided in order to ensure data protection and support value recognition of intellectual property in publishing teaching

material and other publications related to teachers or student work. Integration with other services like portfolio management can ease the amount of data to store as long as data ownership and data sharing policies are addressed.

- *Efforts through platform evolution phases:* Each platform must undergo certain stages of maturity before it can reach its full potential; nevertheless, some challenges (e.g. technical bottlenecks or user onboarding) can be successfully managed by providing a community support.
- *Incentives for active interaction:* Besides successfully completing the assessment process, an incentive for active interaction after onboarding, i.e. in the retention phase, co-provider relations in social communities of teachers and practitioners can provide high quality data about existing services and programs, offering thereby an opportunity to better forecast future support for developing competencies.
- *Behavior modelling and experience design:* The behavior and experience of stakeholders in the retention phase make adequate preparation of scenarios for future experience design in order to trigger or engage existing or new designed customers' preferences and needs (Ojala et al., 2020).
- *Accountability, regulatory and legal compliance:* The platform provider needs to address policies about labor protections and regulatory frameworks (Hardaker, 2022) as educational systems can interact or handle personal data about teachers and to some extent also the data about students.

From the DP customer's perspective, factors for joining the platform are translated into following design criteria:

- *Zero negative impact:* Low resource consumption by minimizing efforts to store and manage data across multiple systems is a paradigm of interest for customers, since their primary job is to educate.
- *Delivery location & time:* Customers expect remote access and 24/7 availability of any content stored or accessible through the platform.
- *Relationship history with the producer:* Existing experiences, response time and response quality in cases of handling challenges, social interactions and flexibility in build sustainable social relations provides customers the perception of belonging and care within the ecosystem.
- *Payment options:* payment options are in this sense related to covering costs occurring while consuming activities provided by actors in the wider ecosystem (like educational program providers, associations for teacher training, cost related to working on projects).
- *Comfort & convenience:* Usefulness and 24/7 availability are contributing to the customer's sense

of comfort and convenience, especially if they are supported by gamification elements contributing to overall user experience, as well as combing the access control and single sign-in or identity management.

- *Recommendations (C2C2C):* Customer-to-customer-to-customer recommendations refers to the support for existing and new complementary communities of teachers and practitioners in the educational ecosystem for exchange of experiences, reviews of educational programs, best practices.
- *Community support:* Within existing and for building new complementary communities, teachers could use social media connectors to establish communication and visibility channels in order to communicate and promote their achievements, recommendations and questions.
- *Producer's reliability:* Customers are assessing the delivered value in relation to their efforts of using another platform and in that sense clear value proposition must be implemented in order to ensure the desired impact.
- *Trust & traceability:* ability to manage, track and review all performance elements which are being assessed through the value chain including administration, preparation, production (e.g. teaching materials), sharing, delivery, while maintaining an acceptable level of trust in social interactions with others.
- *Product or Service safety:* As stated before, teacher's job is primarily to teach and educate, and in that process certain outputs are generated as a result of those and other activities performed at their workplace (including self-education and competencies building). Perception about the quality of the platform to safeguard and manage outputs is therefore important factor and incentive to use a platform.

From the DP producer's perspective, factors for adopting the platform are translated into following design criteria:

- *Sales channels:* In the context of educational institutions and especially the processes of assessment and promotion, "sales" channels are all channels of communication with the "customers" i.e. teachers as consumers of services delivered or managed by producers.
- *Product or Service safety:* In relation to teacher's "job" of educating selves and others, the producer's job is to ensure a stimulating environment for performing activities to gain new competencies and skills prescribed by assessment and promotion rules. Perception about the quality of the platform to safeguard and manage performance measurement data is therefore important factor and incentive to use a platform.

- *Production or Service delivery technologies:* Efficient and effective feasible value creation functionalities, across multiple services through different devices, assuring expected or designed outcomes available 24/7 and remotely with connectors to other systems and social media.
 - *Product or Service Quality:* This factor deals with platform's ability to provide feasible value creation scenarios, building thereby the perception on comfort, convenience and trustfulness of available functionalities.
 - *Resources:* Resources needed for implementing appropriate digital technologies to empower, support or simplify the process, minimize actors' effort in using the platform and providing value for all stakeholders.
 - *Inbound logistics / Supply Chain:* Producer's input is related to opportunities of supporting the teachers in acquiring new skills and competencies, organizing educational and training activities, providing feedback on existing performance milestones, assessing educational programs provided by other stakeholders which can be offered to existing customers and similar inbound services.
 - *Innovations:* Based on data mining and existing evaluation protocols and results, the platform should enable options for building innovation potentials, design and adoption of new value creation paradigms, reacting to new technologies and trends, as well as incorporating them into the assessment and promotion process.
 - *Outbound logistics / Distribution chain:* Producer's output is related to delivering clear and traceable decisions and evaluation of running and past organized educational and training activities, providing constructive feedback on achieved performance milestones, assessing participation scores on project activities and similar outbound services, while assuring substitute distribution channels in case of disruptions, and supporting collaboration among actors.
 - *Incentives and sustainability:* Actors acting as producers should design, build and support efforts contributing to raising readiness to adopt new technologies, skills and competencies, as well as ensure availability of motivating initiatives for providing a variety of incentives for active involvement of customers in the platform.
 - *Regulatory compliance:* Producers should design, build and ensure scenarios for managing risks and changing conditions in performing activities related to the assessment and promotion process, as well as contribute to platform's regulatory and legal compliance.
- Figure 4 visualizes the Conceptual architecture of an HR digital platform for schools by presenting an overview of different roles, their design criteria and perspectives.



Figure 4. Conceptual architecture of an HR digital platform for schools [Author's work, using storyset.com]

A conceptual architecture model of an HR digital platform for schools for supporting the process of assessment and promotion presented in Figure 4, shows only the most relevant design criteria. Since the design criteria cover most of important functional specification for understanding value propositions for relevant stakeholders, they provide some design input

for deciding on future development of such a platform. In order to specify with more detail specific design criteria not occurring in existing systems contributing to HR data in schools, a wireframe illustrating technological extensions is given in figure 5, showing a simplified DP customer view.

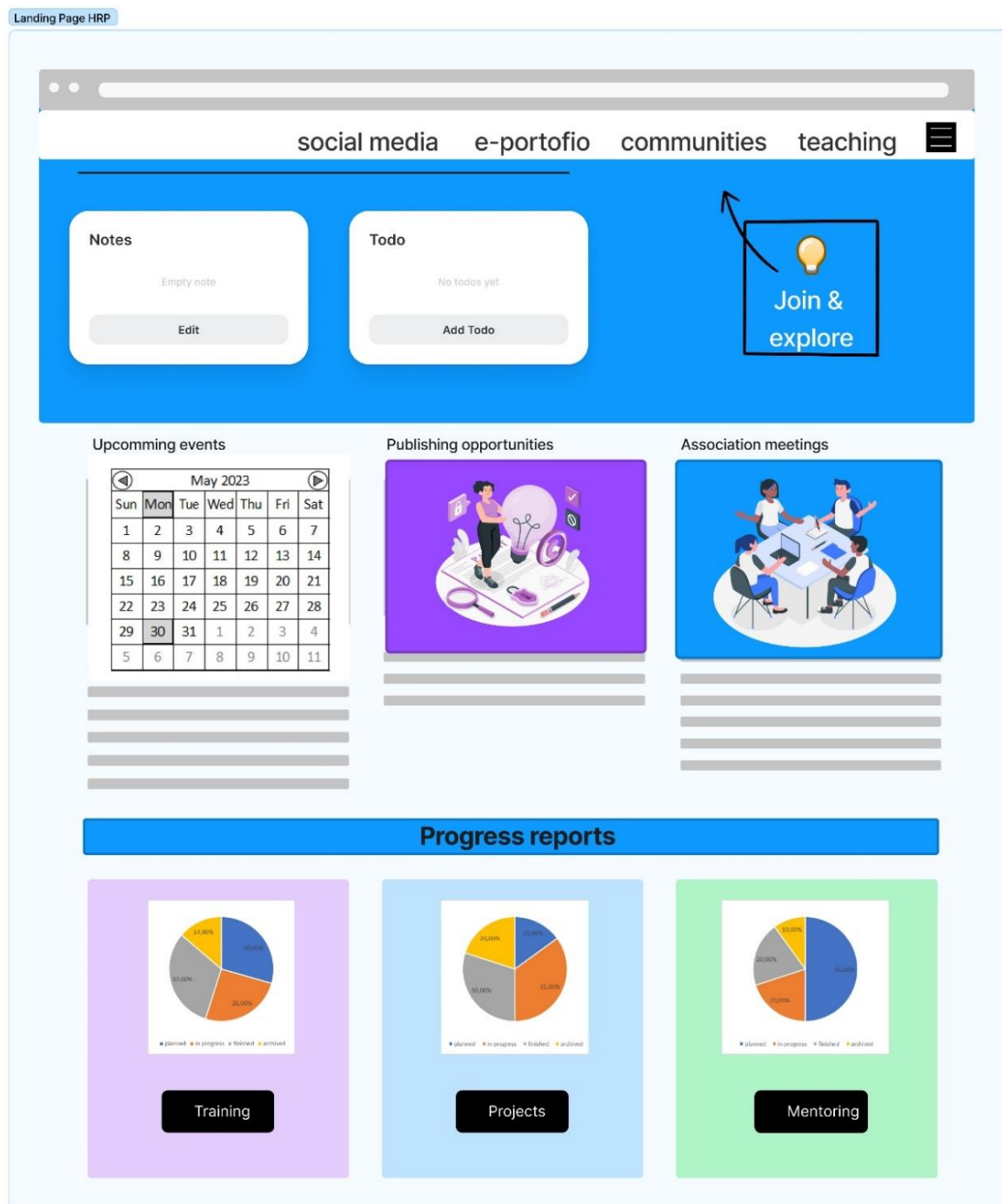


Figure 5. Wireframe example for an HR digital platform for schools – DP customer view [Author’s work, using storyset.com and Figma]

4 Evaluation the conceptual architecture of an HR digital platform for schools

A conceptual architecture model of an HR digital platform for and the illustrative wireframe model, are based on the starting value propositions for main actors and cover most design criteria which are intended to contribute in delivering the set value propositions. DP customers could receive value from integration with other systems (like e-portfolio), social media connectors for more collaboration with peers (through communities and direct usage of social media platforms integrated into the HR platform), as well as from gamification elements illustrating progress among selected categories for tracking their personal achievements (e.g. progress report). DP producers could harvest more value through data analytics based on single platform integrating teaching and excellence parameters, as well as more inclusion into the progress of consuming offered activities and events. DP provider could harvest benefit from confirming their role of being a key provider of services and infrastructure, valuable to core actors of the ecosystem.

5 Conclusion

A conceptual architecture model of an HR digital platform for schools for supporting the process of assessment and promotion presented in this paper, is based on the starting value propositions for main actors and described design criteria which are intended to contribute in delivering those value propositions. The design criteria are derived from specific factors of decision-making for using the platform from existing research and seem to cover the basic architectural elements defining the main functional specifications.

Since the specific factors for decision-making of joining, adopting, or implementing a digital platform from existing research offer wide enough but also translatable factors, it can be concluded that such an HR platform could cover important perspectives of relevant stakeholders and, together with a wireframe illustrating technological extensions, provide enough design input for the future development of such a platform. Also, the open and modular architecture set as design criteria from the start, would be a mean for integrating existing systems into a more comprehensive tool designed to aid teachers in managing their educational and other outputs. Such an integrated HR platform would be able to meet the value proposition of supporting the described process of assessment and promotion in schools, and provide collaboration with other stakeholders, aiming to assist the personal development as well as the development of communities within the ecosystem.

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Appendix I: List of publications used for text-mining

1. Li Z., Le Kernec J., Abbasi Q., Fioranelli F., Yang S., Romain O.; Radar-based human activity recognition with adaptive thresholding towards resource constrained platforms; 2023; Scientific Reports
2. Dong W.; A Study on the Construction of Human Resources Audit Management Platform Based on Big Data; 2022; ACM International Conference Proceeding Series
3. Ota K., Baba E.; Kyushu Promotion Plan for the Platform of Human Resource Development for Cancer; 2022; Gan to kagaku ryoho. Cancer & chemotherapy
4. Mat Saad M.F., Listyo Nugro A.W., Thinakaran R., Baijed M.; A Review of Artificial Intelligence Based Platform in Human Resource Recruitment Process; 2022; 2021 6th IEEE International Conference on Recent Advances and Innovations in Engineering, ICRAIE 2021
5. Zhao X., Shi L., Ruan S., Bi W., Chen Y., Chen L., Liu Y., Li M., Qiao J., Mao F.; CircleBase: An integrated resource and analysis platform for human eccDNAs; 2022; Nucleic Acids Research
6. Cheng Y.; Robustness Analysis of Strategic Human Resource Management Information Platform based on SPSS Big Data Intelligent Debugging Algorithm; 2022; International Conference on Edge Computing and Applications, ICECAA 2022 - Proceedings
7. Lu Y.; JQuery Implementation of Online Platform for University Human Resource Management Mode Based on Multi-Centralized Networking Algorithm; 2022; 5th International Conference on Inventive Computation Technologies, ICICT 2022 - Proceedings
8. Liu L., Sun B., Xu Q.; Mobile Edge Computing Application in Enterprise Human Resource Management Platform Based on Task Scheduling Algorithm; 2022; Mobile Information Systems
9. Heinrich D., Schramm F.; New perspective on platform work - internal crowdworking as an instrument to facilitate strategic human resources management; 2022; International Journal of Work Innovation
10. Chen W., Du C.; Human Resource Decision-Making and Recommendation Based on Hadoop Distributed Big Data Platform; 2022; Mathematical Problems in Engineering
11. Xu Y.; Data Analysis of Human Resource Performance Appraisal Based on Intelligent Attendance Web Platform; 2022; Lecture Notes on Data Engineering and Communications Technologies
12. Chai M.; Design of Rural Human Resource Management Platform Integrating IoT and Cloud Computing; 2022; Computational Intelligence and Neuroscience
13. Yang H.; Human Resource Big Data Analysis and Decision Making of Group Enterprises Based on Cloud Platform; 2022; Proceedings - 2022 14th International Conference on Measuring Technology and Mechatronics Automation, ICMTMA 2022
14. Peng Q.; Design of Intelligent Information Platform for Human Resource Allocation Based on Fuzzy Data Mining Algorithm; 2022; Proceedings - 4th International Conference on Smart Systems and Inventive Technology, ICSSIT 2022
15. Luo L., Zhu X.; Management Analysis of Human Resources Sharing Economy Platform Under Big Data Technology; 2022; Lecture Notes on Data Engineering and Communications Technologies
16. Hu Y.; Data Analysis of Human Resource Performance Appraisal Based on Intelligent AttendanceWeb Platform; 2021; ACM International Conference Proceeding Series
17. Yan R., Wang L.-J., Liu L., Li X.-F., Zhou B.-Y., Jiang N., Liu H.; A preliminary study on the mixed teaching of human parasitology based on mooc resources and the experimental teaching digital platform; 2021; Chinese Journal of Schistosomiasis Control
18. Guyonnet S., Rolland Y., Takeda C., Ousset P.-J., Ader I., Davezac N., Dray C., Fazilleau N., Gourdy P., Liblaur R., Parini A., Payoux P., Pénicaud L., Rampon C., Valet P., Vergnolle N., Andrieu S., De Souto Barreto P., Casteilla L., Vellas B., INSPIRE Platform Group; The INSPIRE Bio-Resource Research Platform for Healthy Aging and Geroscience: Focus on the Human Translational Research Cohort (The INSPIRE-T Cohort); 2021; Journal of Frailty and Aging
19. Messinger A., Sirmipilatzte N., Heuer K., Loh K.K., Mars R.B., Sein J., Xu T., Glen D., Jung B., Seidlitz J., Taylor P., Toro R., Garza-Villarreal E.A., Sponheim C., Wang X., Benn R.A., Cagna B., Dadarwal R., Evrard H.C., Garcia-Saldivar P., Giavasis S., Hartig R., Lepage C., Liu C., Majka P., Merchant H., Milham M.P., Rosa M.G.P., Tasserie J., Uhrig L., Margulies D.S., Klink P.C.; A collaborative resource platform for non-human primate neuroimaging; 2021; NeuroImage
20. Liu P., Qingqing W., Liu W.; Enterprise human resource management platform based on FPGA and data mining; 2021; Microprocessors and Microsystems
21. Kim Y.H., Cha H.R., Lee J.E., Cha S.E., Choi Y.J.; Introduction to the human disease resource search and distribution platform through the Korea Biobank Network portal; 2021; Journal of the Korean Medical Association
22. Keegan A., Meijerink J.; Online labour platforms, human resource management and platform ecosystem tensions: An institutional perspective; 2021; Platform Economy Puzzles: A Multidisciplinary Perspective on Gig Work

23. Yan Z.; Optimization of Relevance Weighting Algorithm Based on Hadoop Platform in Human Resource Information System; 2021; Proceedings - 2nd International Conference on Smart Electronics and Communication, ICOSEC 2021
24. Zhu J., Wang Y., Yu X.; Hybrid Resource Modeling and Scheduling Platform Based on Multisource Cooperation for Cyber-Physical-Human System; 2021; Mobile Information Systems
25. Zhouhuo W.; Parallel Classification Algorithm Design of Human Resource Big Data Based on Spark Platform; 2021; Security and Communication Networks
26. Yang X., Yang Q.; Research on Human Resource Decision-Making Technology Based on Hadoop Platform; 2021; Lecture Notes in Electrical Engineering
27. Zhang C.-M., Liu L.; Big Data Based Human Resources Professional Distance Training Platform; 2021; Lecture Notes of the Institute for Computer Sciences, Social-Informatics and Telecommunications Engineering, LNICST
28. Kuhn K.M., Meijerink J., Keegan A.; Human resource management and the gig economy: Challenges and opportunities at the intersection between organizational hr decision-makers and digital labor platforms; 2021; Research in Personnel and Human Resources Management
29. Wang Q.; Enterprise human resource management system monitoring based on embedded system and 5G big data platform; 2021; Wireless Networks
30. Boudjedar S., Bouhenniche S., Mokeddem H., Benachour H.; Automatic Human Resources Ontology Generation from the Data of an E-Recruitment Platform; 2021; Communications in Computer and Information Science
31. Meijerink J., Keegan A., Bondarouk T.; Having their cake and eating it too? Online labor platforms and human resource management as a case of institutional complexity; 2021; International Journal of Human Resource Management
32. Liu T.; Informatization construction of human resource management in retail industry based on SaaS platform; 2020; ACM International Conference Proceeding Series
33. Lyu B., Chen J., Wang N.; Live Teaching Platform for Human Resource Development and Management Based on Big Data Recommendation Technology; 2020; Proceedings - 2020 5th International Conference on Smart Grid and Electrical Automation, ICSGEA 2020
34. Khan M.H., Muktar S.N.; A bibliometric analysis of green human resource management based on scopus platform; 2020; Cogent Business and Management
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