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A Phased Model for Digitalizing Human Resource Management in Small and Medium-Sized Enterprises

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Abstract-.Small and medium-sized enterprises (SMEs) face a practical challenge when digitalizing human resource management (HRM). They must decide which processes to digitalize first, how to allocate limited resources, and when to invest in more advanced capabilities. This article develops a phased model based on a conceptual synthesis of selected literature on SME digital transformation, electronic HRM, and HR analytics. The model comprises four phases: HR process assessment and standardization, employee record digitization, workflow automation and integration, and the use of HR data in managerial decisions. Each phase specifies its expected outputs and the conditions for moving to the next phase. The model treats data quality, employee adoption, and process ownership as prerequisites for expanding the scope of digitalization. Its main contribution is to translate these prerequisites into practical criteria that SMEs can use when making investment and implementation decisions. The model requires empirical validation across firms of different sizes and sectors.

Keywords : digital HRM, digital transformation, small and medium-sized enterprises, process automation, HR analytics, digital maturity

I. INTRODUCTION

An sme can introduce an online leave request form while continuing to reconcile approvals, employee records, and payroll manually. The initial step changes how an employee submits a request, but the underlying administrative burden may persist if the workflow relies on duplicate data entry and unclear responsibilities. This example illustrates a broader question for smes considering hr digitalization. Which changes must precede investment in new technology for that investment to improve how hr work is performed?

The question is especially relevant to firms with limited budgets, uneven digital skills, and small administrative teams. The oecd (2021) identifies financial, skills, and organizational barriers to digital adoption among smes. In hrm, these constraints shape decisions about which functions to digitalize, how to support employees during implementation, and whether the firm can maintain its systems after launch. Firms therefore need a way to assess the next investment against their currEnt processes and capabilities.

This article addresses the following research question. How can smes sequence hr digitalization investments according to their organizational readiness and resource constraints? Its objective is to develop a phased model that links each investment to a defined process need, an expected operational output, and observable criteria for moving forward.

II. LITERATURE REVIEW

Strohmeier (2020) Distinguishes among hr digitization, digitalization, and digital transformation. In the context of this article, *Digitization* Refers to converting information into digital form, as when a firm replaces paper personnel files with structured electronic records. *Digitalization* Refers to Using digital data and tools to improve or reconfigure an hr process, as when leave requests are submitted, approved, and recorded through a shared workflow. *Digital transformation* Involves broader changes in how the hr function operates and contributes to organizational decisions. Vial (2019) likewise situates digital transformation within a process of organizational change enabled by digital technologies. These distinctions help specify what a firm is trying to achieve at each phase.

Bondarouk Et al. (2017) Review electronic hrm research and identify technological, organizational, and people-related factors that shape adoption. For an sme, this implies that the suitability of an hr system depends partly on whether the firm can assign responsibility for the process, train its users, and incorporate the system into everyday work. The oecd (2021) also emphasizes that smes vary in their digital capabilities and face different constraints across sectors and firm sizes. These findings support an implementation model in which progression depends on the firm's readiness and operating needs.

Marler And boudreau (2017) examine the evidence on hr analytics adoption and its relationship to organizational performance. Their review identifies limited empirical evidence on how firms realize benefits from analytics. For

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the proposed model, the practical implication is to start with a specific decision that accessible hr data can help inform. A firm might analyze whether departures frequently occur within the first three months of employment, then review onboarding practices before deciding what to change. When employee counts are small, reporting the number of departures alongside the rate helps managers interpret changes in context.

III. RESEARCH APPROACH

This study adopts a conceptual research approach to develop a phased model for digitalizing human resource management (hrm) in small and medium-sized enterprises (smes). It draws on selected literature on digital transformation, technology adoption in smes, electronic hrm, and hr analytics. These four areas inform different aspects of the model. Digital transformation research provides a basis for distinguishing between the digitization of records, the redesign of workflows, and broader changes in how hr operates. Research on smes helps explain how budget constraints, digital skills, and administrative capacity can shape implementation choices. Electronic hrm studies inform the model's treatment of process ownership and user adoption, while hr analytics research informs its final phase, in which workforce data is used tO support managerial decisions.

The synthesis focused on the relationships among the capabilities required at different points in the implementation process. For example, automating leave approval depends on clearly defined approval rules and reliable employee records. Using leave data for staffing decisions subsequently depends on whether employees use the workflow consistently and whether the resulting records accurately reflect approved absences. Examining these dependencies provided a basis for sequencing the model. The sequence was organized around the capabilities an enterprise needs to establish, with the starting point determined by the maturity Of the hr process under review.

Three design questions guided the development of each phase. The first concerned the operational problem the enterprise should address, such as delays in approving requests or discrepancies in employee records. The second concerned the organizational capability required to address that problem, such as the ability to maintain a shared employee register or manage approvals through a standardized workflow. The third concerned the observable evidence that would indicate readiness to proceed. Depending on the phase, such evidence could include the completeness of required records, consistent use of a pilot workflow, or an improvement in processing time relative To a baseline. These questions were translated into implementation activities, expected outputs, and readiness criteria for eAch phase.

The hr process is the practical unit of application because different functions within the same enterprise may be at different levels of digital maturity. A firm may, for instance, have reliable payroll records while still handling onboarding manually. Assessing readiness at the process level allows managers to identify where an investment could address a specific bottleneck and to evaluate a limited implementation before expanding it. The resulting model and its readiness criteria are conceptual proposals. Their applicability and the operational benefits associated with each phase remain to be tested through case studies or longitudinal evaluations across smes of different sizes and sectors.

IV. RESULTS

1. The proposed phased model

The conceptual synthesis presented in this article suggests that the sequence of hr digitalization should reflect an sme's ability to manage its processes, maintain reliable employee records, and support staff in using new digital tools. Smes can differ considerably in these capabilities, even when they use similar software. A firm may already maintain accurate payroll records while relying on emails and spreadsheets to manage leave requests. Another may have an employee self-service portal but struggle to keep records up to date because responsibility for updating them is unclear. The proposed model therefore takes the current state of each hr process as the starting point for deciding what to digitalize and in what order.

The first two phases establish the organizational and informational foundations for digitalization. The first phase involves examining how a priority hr process currently works, identifying where delays or errors occur, and clarifying who is responsible for each step. This assessment gives the firm a basis for choosing what to improve and measuring whether the change addresses the original problem. The second phase focuses on the employee data required to carry out the process. It involves checking the completeness of records, reconciling discrepancies, and assigning responsibility for keeping information current. For example, a digital leave approval workflow depends on accurate opening balances, clear approval rules, and a consistent way to record corrections. Resolving these issues before implementation reduces the need for manual adjustments after launch.

The third phase introduces automation and integration on a scale the firm can support. An sme can begin with a recurring workflow, such as leave approval or onboarding, and pilot it with a limited group of users. During the pilot, the firm can track whether employees use the workflow consistently, how managers handle exceptions, and whether processing time or error frequency improves compared with the baseline. The fourth phase builds on the records generated through routine

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use of the system. Managers can use these records to answer specific workforce questions, such as whether overlapping leave requests could create staffing shortages or where delays occur during onboarding. The value of this phase lies in connecting an indicator to a decision that managers can act on and review.

Progression through the model depends on observable results and the needs of the firm. An sme with reliable employee records may be ready to automate a particular workflow after a brief process review, while another may need to devote more time to clarifying approval rules or correcting records. Different hr processes within the same firm may also progress at different rates. By applying the model first to a process with a clear operational problem, an sme can evaluate the benefits of a limited investment before deciding whether to expand its scope. Table 1 presents the four phases, the outputs expected at each phase, and the criteria for assessing readiness to proceed.

Table 1. The proposed phased model

Phase	Main activities	Expected output	Readiness criterion
1. Assess and standardize HR processes	Map recurring activities, identify bottlenecks, assign responsibility, and record baseline indicators.	A documented workflow and a prioritized set of improvements.	The firm has identified who owns the priority process, how it works, and which problem digitalization should address.
2. Digitize and consolidate employee records	Establish a central employee register, standardize required fields, reconcile duplicate records, and define access rights.	A shared source of employee data for the selected processes.	Required records are complete enough for the intended workflow, and responsibility for maintaining them is assigned.
3. Automate and integrate priority workflows	Pilot a workflow such as leave approval or onboarding. Connect it to relevant records and test how exceptions are handled.	A workflow employees and managers can use in their routine work.	The pilot shows regular use, consistent handling of exceptions, and improvement on at least one baseline indicator.
4. Use HR data in managerial decisions	Select a workforce question, review relevant indicators, agree on an action, and track the outcome.	A recurring review in which HR data informs a defined decision.	Managers can explain how the indicator is calculated, what action it informed, and how the outcome will be reviewed.

2. Applying the model to leave administration

Leave administration illustrates how an sme can apply the four-phase model to a recurring hr process. The workflow begins when an employee submits a request and continues through managerial approval, the adjustment of the employee's leave balance, and the recording of approved dates in the work schedule. Delays and errors can arise at any of these points, particularly when requests are submitted by email, balances are maintained in a spreadsheet, and schedules are updated separately. Mapping these steps helps the firm identify where delays occur, where information is entered more than once, and who Is responsible for each update.

In the first phase, the firm documents the existing workflow and establishes a baseline against which it can evaluate later changes. It can record the median time from submission to decision, the number of balance corrections per 100 approved requests, and the number of requests that require follow-up. Distinguishing among causes of delay gives these measures practical value. For example, if delays arise mainly when an approving manager is absent, the firm can designate a substitute approver. If corrections arise because employees and managers consult different versions of a balance, the priority iS to establish a shared record.

In the second phase, the firm consolidates employee records and confirms each employee's opening leave balance, taking into account previously approved leave and any outstanding corrections. It also defines who can view individual records, approve requests, and modify balances. The process owner should agree on how cancellations, changes to approved dates, and disputed balances will be handled. These decisions determine what the digital workflow needs to support and provide a basis for checking wHether it operates as intended.

In the third phase, the firm pilots the digital workflow in one team. The pilot should cover routine requests as well as exceptions, such as an absent approver or a cancellation after approval. The firm can compare approval times and correction rates with the baseline over comparable periods, taking account of differences in request volume. It should also track the proportion of all requests submitted through the digital workflow. For example, approval times may appear to improve if employees use the platform for straightforward requests while continuing to submit more complex cases by email. Including requests from both channels gives managers a clearer basis for deciding whether to adjust the workflow, extend the pilot, Or roll it out to another team.

In the fourth phase, managers can use reliable leave records to inform staffing decisions. A weekly review of approved leave, combined with planned work schedules, can identify periods when overlapping absences may leave a team below its minimum staffing level. Managers can then adjust shift assignments, arrange temporary cover, or reschedule non-urgent work. Tracking how often teams fall below the staffing threshold can help the firm evaluate whether reviewing leave data in advance improves workforce planning. This connects the digital workflow to a specific management decision and an outcome tHat can be monitored over time.

The model allows smes to start at the point where an essential capability is missing. A firm with accurate balances and clear approval rules may be ready to pilot automation after a brief process review. A firm with recurring discrepancies may first need to reconcile its records and clarify who maintains them. Evidence from the leave administration pilot can then guide the next investment, whether that involves extending the workflow across the firm or applying the same approach to another process, such as onboarding.

V. CONCLUSION

This study developed a four-phase model to help small and medium-sized enterprises (smes) decide which human resource management (hrm) processes to digitalize first and when to invest in more advanced capabilities. The phases cover the assessment and standardization of hr processes, the digitization and consolidation of employee records, the automation and integration of priority workflows, and the use of hr data in managerial decisions. The model links each phase to a specific operational problem and an observable criterion for Assessing readiness to proceed.

The main contribution of the model is to make implementation decisions at the level of individual hr processes. An sme may have accurate employee records and clear approval rules for leave administration while still relying on informal procedures for onboarding. Applying the model at the process level allows the firm to direct its resources toward the problems it can address with its current capabilities. The leave administration example illustrates how a firm can establish a baseline, verify records, pilot a workflow, and assess whether employees and managers use it consistently. Once the records generated through the workflow are reliable, managers can use them to anticipate staffing gaps and adjust schedules.

The model was developed through a conceptual synthesis of selected literature, so its readiness criteria and expected operational benefits require empirical validation. Future research could follow smes through implementation and measure approval times, record correction rates, user adoption, and administrative workload before and after digitalization. Interviews with employees and managers could help explain why some workflows become routine while others continue to rely on parallel channels. Comparing firms by size, sector, and initial digital maturity would help determine which readiness criteria apply across settings and which require adaptation. Such evidence would clarify when a phased approach helps smes achieve sustained improvements in hr operations and workforce planning.

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