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DIGITAL TECHNOLOGIES AND LABOUR USE IN SERVICE ENTERPRISES: SUBSTITUTION OR COMPLEMENTARITY?

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Abstract

The article examines how digital technologies affect the use of labour resources in service enterprises. Six task categories are assessed by their automation potential, revealing a clear division: routine administrative work and standard transactions fall within the substitution zone, whereas diagnostics, complex problem solving and relationship building fall within the complementarity zone. The boundary lies at approximately 50 per cent of task time. A reallocation model shows that automation does not primarily reduce headcount but changes the composition of working time: the share devoted to routine tasks falls from 52 to 24 per cent, while client interaction rises from 31 to 44 per cent. Conditions under which the reallocation effect is realised are substantiated, together with the organisational requirements it imposes.

Keywords: Digital technologies, automation, labour use, task reallocation, service enterprise, substitution, complementarity, workforce composition.

Introduction

The effect of digital technologies on employment is frequently discussed in terms of displacement: automation is expected to reduce the number of jobs. In service activities this framing is too simple and leads to incorrect management conclusions.



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Services consist of heterogeneous tasks. Within a single position an employee performs routine administrative operations, standard transactions and complex interactions with clients. These tasks differ fundamentally in their susceptibility to automation.

The relevant question is therefore not whether technology replaces employees, but which parts of their work it replaces and what happens to the time released. The answer determines whether automation reduces employment or changes its content.

A further consideration concerns the conditions under which any effect materialises. Technology introduced without corresponding organisational change produces limited results: the released time is absorbed by existing routines rather than redirected towards higher-value activity.

The purpose of the study is to establish how digital technologies affect the use of labour resources in service enterprises and to determine the conditions under which the reallocation effect is realised.

Research methodology

The study applies task decomposition, comparative analysis and organisational modelling. Work within service positions is decomposed into six task categories distinguished by the degree of judgement and interpersonal interaction they require.

Automation potential is expressed as the share of task time that can be performed by digital tools without loss of outcome quality. The boundary between substitution and complementarity is placed at 50 per cent: above this level technology performs the task, below it technology supports the employee.



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The reallocation effect is modelled by comparing the composition of working time before and after automation. Total working time is held constant, so that the model describes redistribution rather than reduction.

A limitation is acknowledged: the estimates are based on expert assessment of task structure rather than on direct time measurement. Their quantitative confirmation would require observational study at the enterprise level.

Literature Review

The task-based approach to analysing technological change was developed by D. Autor, F. Levy and R. Murnane. Their central insight is that technology substitutes for tasks rather than for occupations, and that the effect depends on whether a task follows explicit rules.

Routine tasks, whether manual or cognitive, are susceptible to automation because they can be codified. Non-routine tasks requiring judgement, flexibility or interpersonal interaction are not, and technology frequently increases their value by handling the routine work that previously surrounded them.

D. Acemoglu and P. Restrepo formalised the distinction between displacement and productivity effects. Automation displaces labour from specific tasks while simultaneously raising productivity, which generates demand for labour in other tasks. The net outcome depends on the relative magnitude of these effects.

E. Brynjolfsson and A. McAfee documented a lag between technological adoption and productivity gains, attributing it to the organisational adjustments that technology requires. Their conclusion is that the accompanying changes, rather than the technology itself, determine the result.

In the service management literature, the emphasis falls on the interaction component. Since a substantial part of service value is created through contact with



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the client, technologies that release time for such contact operate as complements rather than substitutes.

Analysis and results

Assessing the effect of technology requires disaggregating the work performed within a service position. Aggregate judgements about whether a profession will be automated obscure the fact that automation operates at the level of individual tasks.

Tasks differ in the degree to which they can be codified. Where an operation follows explicit rules and produces a predictable outcome, it can be transferred to a digital tool. Where it requires interpretation, judgement or response to an unexpected situation, it cannot.

The assessment below ranks six task categories by their automation potential (Figure 1).

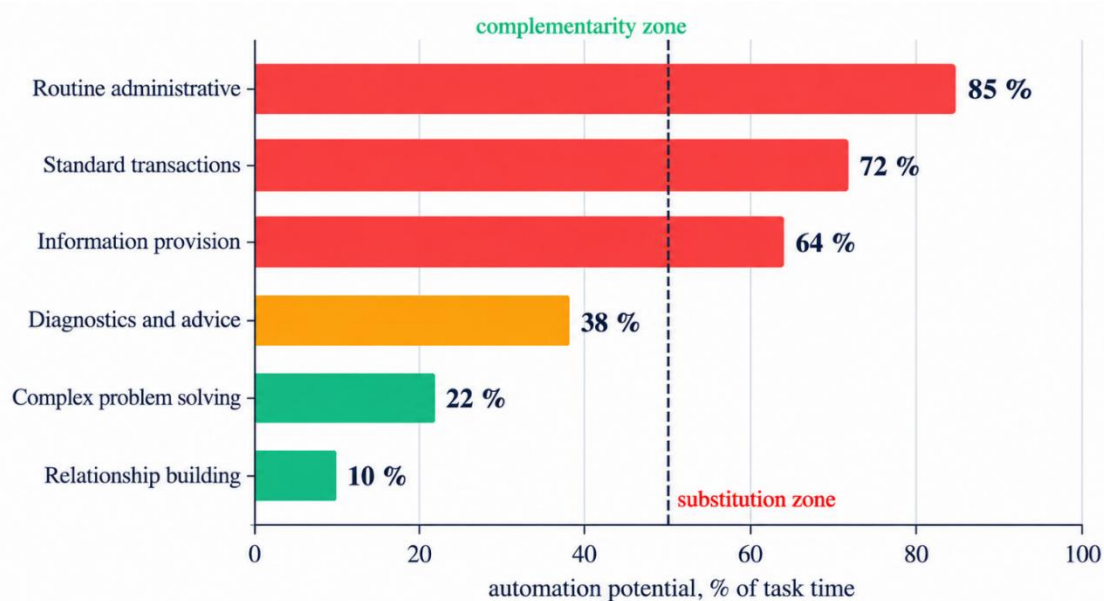


Figure 1. Automation potential across task categories



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The distribution divides clearly at the 50 per cent boundary. Routine administrative work (85 per cent) and standard transactions (72 per cent) fall within the substitution zone, where technology performs the task rather than supporting the employee.

Information provision occupies an intermediate position at 64 per cent. Standard enquiries are handled by automated systems, while non-standard ones are escalated to an employee – a division that has become common practice in service delivery. Below the boundary lie diagnostics and advice (38 per cent), complex problem solving (22 per cent) and relationship building (10 per cent). In these categories technology supplies information and analytical support, but the outcome depends on the employee.

The distribution has a direct managerial implication. Positions dominated by tasks from the upper part of the figure will contract; positions dominated by tasks from the lower part will not. Most service positions contain both, and the practical question is how their composition changes.

The transfer of routine tasks to digital tools releases working time. What happens to that time determines whether automation produces a genuine effect or merely a redistribution of idle capacity.

Two outcomes are possible in practice. The released time may be redirected towards tasks that create higher value, or it may be absorbed by existing routines without visible change. The first outcome requires deliberate organisational intervention; the second occurs by default.

The reallocation model below compares the composition of working time before and after automation under the first scenario (Figure 2 and Table 1).



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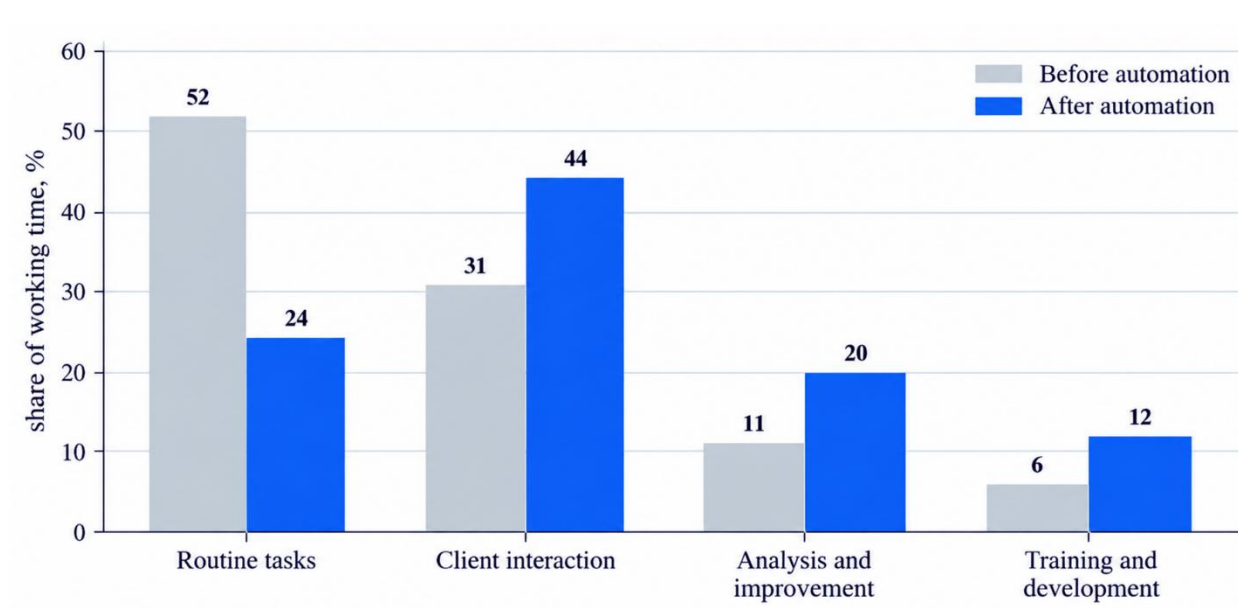


Figure 2. Composition of working time before and after automation

The share of routine tasks falls from 52 to 24 per cent, a reduction of 28 percentage points. This is the direct substitution effect and it corresponds to the automation potential established in the preceding analysis.

The released time is distributed across three categories. Client interaction receives the largest share, rising from 31 to 44 per cent. Analysis and improvement work nearly doubles, from 11 to 20 per cent, and time devoted to training rises from 6 to 12 per cent.

Total working time remains unchanged. The model therefore describes a change in the content of work rather than a reduction in its volume — the employee performs different tasks rather than fewer tasks.



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The economic significance of this shift lies in the value of the tasks involved. Client interaction and analytical work generate higher value per hour than routine administration, so that the same labour input produces a greater result.

Table 1 Conditions for realising the reallocation effect

Condition	Content	Consequence of non-fulfilment
Task redefinition	Formal revision of job descriptions and performance expectations	Released time is absorbed by existing routines
Competence development	Training for the tasks that receive the released time	Employees remain unable to perform higher-value work
Revision of performance measures	Indicators shifted from volume of operations to outcomes	Behaviour continues to follow the previous measures
Data quality	Reliable and integrated data for the automated processes	Automation produces errors requiring manual correction
Managerial capability	Supervisors able to direct work towards higher-value tasks	Reallocation is not enforced in daily practice

The table identifies the organisational requirements that determine whether the reallocation effect materialises. None of them concerns the technology itself; all concern the arrangements surrounding it.

The third condition deserves particular emphasis. Where performance is measured by the volume of operations completed, employees continue to prioritise routine work even after it has been automated, because the measurement system rewards it.

The fourth condition explains a frequent implementation failure. Automation applied to fragmented or unreliable data generates errors that require manual



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correction, so that the released time is consumed by rework and the net effect approaches zero.

The general conclusion is that the effect of digital technologies on labour use is conditional rather than automatic. The technology creates the possibility of reallocation; the organisational arrangements determine whether that possibility is realised.

Conclusion

First, automation operates at the level of tasks rather than occupations. Six task categories divide clearly at the 50 per cent boundary: routine administration and standard transactions fall within the substitution zone, while diagnostics, complex problem solving and relationship building fall within the complementarity zone.

Second, most service positions contain tasks from both zones. The practical effect of automation is therefore a change in the composition of work rather than the elimination of positions.

Third, the reallocation model shows the share of routine tasks falling from 52 to 24 per cent, with client interaction rising from 31 to 44 per cent and analytical work nearly doubling. Total working time remains constant.

Fourth, the economic effect arises from the difference in value between the tasks involved: the same labour input produces a greater result because it is applied to higher-value activity.

Fifth, the reallocation effect is conditional. Five organisational conditions determine whether it materialises, and none of them concerns the technology itself. Where performance measures continue to reward volume of operations, behaviour does not change.



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Further research will examine the reallocation effect through direct time measurement at service enterprises and assess its relationship with financial performance.

References

1. Autor D.H., Levy F., Murnane R.J. The skill content of recent technological change: An empirical exploration // The Quarterly Journal of Economics. – 2003. – Vol. 118, No. 4. – P. 1279-1333.
2. Acemoglu D., Restrepo P. The race between man and machine: Implications of technology for growth, factor shares, and employment // The American Economic Review. – 2018. – Vol. 108, No. 6. – P. 1488-1542.
3. Brynjolfsson E., McAfee A. The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. – New York: W.W. Norton & Company, 2014. – 306 p.
4. Autor D.H. Why are there still so many jobs? The history and future of workplace automation // Journal of Economic Perspectives. – 2015. – Vol. 29, No. 3. – P. 3–30.
5. Frey C.B., Osborne M.A. The future of employment: How susceptible are jobs to computerisation? // Technological Forecasting and Social Change. – 2017. – Vol. 114. – P. 254-280.
6. Davenport T.H., Ronanki R. Artificial intelligence for the real world // Harvard Business Review. – 2018. – Vol. 96, No. 1. – P. 108-116.
7. Baumol W.J. Macroeconomics of unbalanced growth: The anatomy of urban crisis // The American Economic Review. – 1967. – Vol. 57, No. 3. – P. 415-426.
8. OECD Employment Outlook: Artificial Intelligence and the Labour Market. – Paris: OECD Publishing, 2023.