

# The Effect of Job Resources Demand on Job Performance Through Work Engagement, which is moderated by Computer-Related Technostress

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## Abstract

**Background:** The availability of information technology can support performance achievement. On the other hand, the information available in abundance can reduce the focus of research. Dependence on information technology raises its own anxiety for lecturers, including access to knowledge which is used as a reference for research development.

**Research objective:** to analyze the effect of Job Resources Demand (JD-R) on Job performance (JP) through Work engagement (WE) moderated by Computer-Related Technostress (CRT) on lecturers at the Higher Education Services Institution (LLDIKTI) 4, West Java and Banten.

**Methods:** using a verification survey of 400 lecturers who were taken at random.

**Results:** work engagement requires the support of work resources and personal resources. The variety of skills regarding the application used for research and learning opportunities is an important aspect that encourages work engagement. Endurance in facing research constraints and self-efficacy are personal resources that determine work engagement. Computer-Related Technostress reduces endurance as a personal resource but does not significantly reduce self-efficacy and increases the function of skills as a driver of WE. The need for problem solving by introducing heutagogy as an initiative to deal with technological complexity and overloaded information that causes stress  
**Conclusion:** Job Resources Demand has an influence on Job performance and Work engagement which is moderated by Computer-Related Technostress.

**Theoretical implications:** The need to explore factors that become resources to strengthen WE and the performance of the availability of information technology and reduce stress through increasing ICT literacy.

**Practical implication:** optimizing the position of information technology to support work with an independent learning process (heutagogy)

**Originality:** The results of the study serve as a conceptual framework for the development of theories on the dark side of information technology in understanding the meaning of technology and humanity in the workplace.

## Keywords

Job Resources Demand, Job Performance, Work Engagement, Computer-Related Technostress.

## 1. Introduction

Information technology has two inseparable sides of the coin. Anxiety arises due to the development of information technology, including those that support work as a lecturer. The availability of information technology applications that support the analysis of research data, including the availability of information, creates anxiety for lecturers. Anxiety arises due to interactions with information technology, which shows a variety of scientific developments and the capacity to support research. The availability of indexed journals with access from the easiest to the most difficult to access is a phenomenon of information technology that affects the behavior of lecturers. Limitations to access information, using application technology as well as gaining access to and getting information about actual developments actually increases the anxiety of the lecturers. The demand for novelty in research becomes more difficult to materialize amid the abundant availability of information.

Dark side of Information technology continues to be a concern of academics. The development of information technology has raised fears of job loss, although on the other hand it helps provide a basis for problem solving through internet access. Technology still raises the fear of mistakes in the use of technology. Even originality and the meaning of authenticity are becoming increasingly difficult to obtain. The use of information technology which is increasing during the Covid-19 epidemic to support work actually raises its own anxiety for lecturers. Okolo et al. (2013) explaining information technology can increase value mismatches and demonstrate resistance to technology. The implementation of information technology creates new structures of power, authority, and decision-making, as processes are re-engineered, old functions are eliminated, and new ones are created (Shellberg & Susi, 2014). Excess communication volume leads to increased workload (Gupta et al., 2013). The dark side of technology was pointed out by Tarafdar et al. (2011) occurs due to constant connectivity that occurs and is connected to a personal computer. Employees feel too stressed to cope and learn to use technology whose workflows or applications are constantly evolving. D'Arcy et al. (2014) adding that there is an increase in technostress due to the increasing dependence of employees on technology (computing and communication devices, enterprise applications, collaborative applications, connectivity tools). Stich et al. (2018) suggested an overloaded technology.

Bondanini et al. (2020) suggests the various types of stress experienced in connection with the use of information technology. Demands such as work overload (overwork, demands for attention), ergonomic pressure, speed of work (i.e. time to do a task is less than the time available), role ambiguity (tasks related to information technology are poorly defined) and monotonous tasks are not challenging. At the community level, use of information technology can create social isolation, emotional overload, or role conflict. At the organizational level, demands are related to competitive advantage in the labor market. Pullins et al. (2020) suggests that technostress reduces the level of job satisfaction and increases stress. La Torre et al. (2018), Pirkkalainen et al. (2019), Nisafani et al. (2020) adding worker technostress cannot be avoided by the flow of digital technology in the organization. Molino et al. (2020) expressed a general feeling of not having enough time to constantly complete tasks and be efficient. It is necessary to understand the dark side of information technology to embrace technology that maintains the meaning of humanity in the world of work and uses and faces technological developments more wisely. One approach is to direct an independent learning process to reduce existing complexity. The framework for independent learning begins with understanding the position of technostress on the work engagement of lecturers in relation to research.

## 2. Literature Review

### 2.1 Job Resources Demand (JD-R)

The JD-R theory has provided an important understanding of employee well-being. There are two processes in the JD-R, namely the 'buffering' and 'boosting' effects. The buffering effect refers to a particular job resource buffering or reducing the effect of demands on job tension (Bakker et al., 2005). Boosting, on the other hand, refers to the way in which job resources are particularly important to employees - or 'increase' their engagement - when job demands are high. Bakker and Demerouti (2014) explained that the main drivers in work are work resources (physical, social, or organizational aspects, coaching, supervision, performance feedback, skill variation, autonomy, and learning opportunities). Personal resources such as positive self-evaluation of the ability to control and influence the environment, including self-efficacy, self-esteem, optimism, resilience, and activation style. Kim and Wang (2018) added that in the JD-R model, there are two categories, namely job demands and resources. Granziera et al. (2021)

argued that one of the strengths of the JD-R theory is its ability to relate contextual and personal factors with relevant outcomes in a process model.

## **2.2 Work Engagement (WE)**

Work engagement developed based on the work engagement theory by Kahn in 1990 (Tomietto et al., 2019). Kahn (1990) suggests WE as self-expression, cognitive and emotional in an effort to carry out job duties and responsibilities. The linkage between organizations and employees is qualitative and quantitative (Tirastittam et al., 2020). Positive thoughts expressed physically, cognitively and affective at work (Schaufeli & Bakker, 2004). WE are related to work that is positive, satisfying, motivated, affective, and prosperous (Bakker & Leiter, 2010). Costa and Passos (2014) explain WE as a subjective condition related to welfare at work, therefore no external manifestation is needed.

WE as a positive state of mind related to work and which is indicated by vigor, dedication, and absorption (Schaufeli et al., 2017). The WE indicator can be measured based on the Utrecht Work Engagement Scale (UWES) with dimensions namely vigor, dedication and absorption (Schaufeli et al., 2017), (Sandhya & Sulphrey, 2020), (Austin et al., 2020). Vigor is a high level of energy and mental endurance at work. Dedication is a sense of importance, enthusiasm, inspiration, pride, and challenge. Absorption is a condition in which a person experiences a fully concentrated situation, dissolves in work, where time passes quickly and it is difficult to get away from work (Han et al., 2020).

## **2.3 Job Performance**

The idea of performance is multi-dimensional, and related to the value of the institution (Campbell et al., 1993). Ivanovic and Colin (2006) describes performance related to attitudes and work results. The performance of the lecturers refers to the Tridarma of higher education for teaching, research and community service. Borman and Motowidlo (1993) distinguishes Job Performance into three dimensions, namely: Task Performance, Contextual Performance and Adaptive Performance.

Zhang et al. (2018) define based on Scott and Bruce (1994) who argues that innovation performance is a multi-stage process, namely: (1) problem recognition and generation of ideas or solutions; (2) innovative seeking support for an idea; and (3) idea completion. Alghamdi (2018) defines Innovative performance as behavioral skills for innovative work results (generating and implementing new and useful ideas). In the context of education related to lecturer performance, the demand for innovation in work is very high. Thaief et al. (2015) states that there are three dimensions in work, namely time, quantity and quality.

## **2.4 Computer-Related Techno-Stress (CRT)**

The term technostress comes from Brod (1984) as a modern disease caused by the inability to deal with computer technology in a healthy manner. Technostress as a condition that causes difficulty in adapting which comes from the use of new technology by individuals and organizations. Computer-related technostress relates to computer technology as a stressful phenomenon due to the inability to cope with the demands of computer use (Tarafdar et al., 2014). Shellberg and Susi (2014) confirms various definitions, mostly based on Brod (1984), Weil and Rosen (1997) namely any negative impact on attitudes, thoughts, behavior, or body physiology caused by technology, either directly or indirectly. Salanova et al. (2014) argued technostress as a negative psychological state related to the use (and abuse) of technology and the threat of technology used in the future.

Tarafdar et al. (2007) presents 5 components of technostress from a source perspective, namely: Techno-overload, Techno-invasion, Techno-complexity, Techno-insecurity, Techno-uncertainty. Cause or techno strain as a negative psychological experience of: (1) high levels of anxiety and fatigue (affective dimension); (2) skepticism (attitude dimension); and (3) ineffectiveness (cognitive dimension) related to the use of technology (Salanova et al., 2013). Okolo et al. (2013) put forward more specifically about the source of technostress based on the people-environmental fit of stress theory that the use of information technology increases the value mismatch for employees related to privacy, job security and the capabilities and demands imposed. Tarafdar et al. (2010) emphasized that technostress is the stress experienced by individuals due to the use of information technology.

## **2.5 Effect of JD-R on Work Engagement**

In the JD-R model, employees attempt to carry out job duties and responsibilities by using self-expression, cognitive and emotional (Kahn, 1990). That effort requires resources (Bakker & Demerouti, 2014). JD-R theory is used to obtain

explanations and predictions about WE and job performance. Albrecht and Marty (2020) explained that the main drivers in work are work resources and personal resources. Work engagement is related to work that is positive, satisfying, motivating, prosperous (Bakker & Leiter, 2010). Occupational health as a source of WE (Lesener et al., 2019). Shi and Gordon (2019) describes job resources as physical and psychological support to ensure continuity in the workplace. Shin and Jeung (2019) added WE related to the employee's condition ranging from unhealthy to prosperous. Positive, satisfying work-related thoughts (Soares & Mosquera (2019). Tirastitam et al. (2020) explained that employee engagement affects the productivity and long-term sustainability of the company.

## 2.6 Effect of WE on Job Performance

Lecturer job performance is closely related to the Tridarma activities of higher education, namely teaching, research and community service. Work in which there is involvement even if it is carried away will result in optimal performance. Breevaart et al. (2015), Nazir and Islam (2017) suggests work engagement and performance as rational psychological experiences mediated by individual perceptions that can create conditions in which employees are personally involved and find it difficult to let go of work and in the end produce JP according to expectations. Dubbelt et al. (2019) explains the relationship between WE and JP Chen (2017), Winarno and Hermana (2019) shows the function of WE to improve the performance of lecturers both in teaching and research.

## 2.7 The Role of CRT as Moderating Variables on Job Performance

Okolo et al. (2013) suggests the relationship between technostress and WE, that is, working in a stressful working condition causes a decrease in WE. In the perspective of person-environment fit (PE fit) the theory is that the mismatch between an individual and his / her environment can result in strain. Persistent connectivity of individuals to different types of collaborative technology or software has created a sense of urgency, which can affect the individual's time and energy which can lead to tension. Employees are under pressure to multitask and work faster, because the demand for tasks exceeds their ability, resulting in nervousness and anxiety which ultimately lowers WE and performance. Muñoz et al. (2016) shows the educators' anxiety related to technology.

Tarafdar et al. (2014) argued that Computer-Related Techno-stress has a negative effect on job performance. Sellberg and Susi (2014) argued that technology can cause cognitive work problems and create technostress. Tarafdar et al. (2010) emphasized that technostress is associated with critical workplace consequences including decreased productivity. Christ-Brendemühl et al. (2020) argued that the technology complexity factor affected the teaching performance of lecturers in the conditions of the Covid-19 pandemic. Other factors, namely techno overload, techno insecurity, and techno-uncertainty have no significant effect. Gugercin (2020) added that employees tend to commitment behavioral deviations in the workplace to balance the difficulties including the consequences of technostress. The conceptual frame work of the research shown in Figure 1 below.

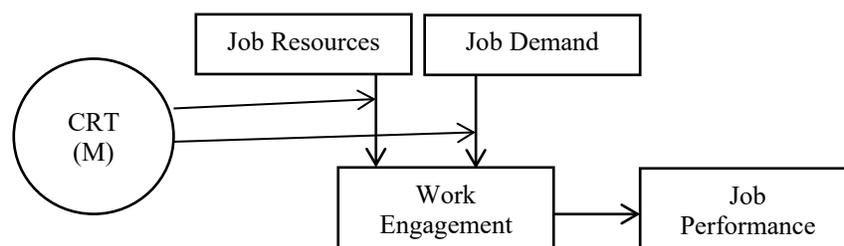


Figure 1: Conceptual frame work

## 3. Methods

The positivistic paradigm is used to obtain an explanation of the relationship between Job Resources Demand, Work engagement, Job performance and Computer-Related Technostress as a moderating variable. The research data were obtained through a survey using a questionnaire distributed to 400 private university lecturers in the provinces of West Java and Banten, Indonesia. Respondents were selected randomly without regard to area proportionally.

JD-R measurement refers to Bakker and Demerouti (2014) which divides into: (1) job resources including social support, performance feedback, autonomy, and learning opportunities. Personal resources, namely self-efficacy, self-esteem, optimism, resilience, and variety of skills. (2) Job demand, namely work pressure and emotional demands.

WE measured referring to the Utrecht Work Engagement Scale (UWES) with dimensions namely vigor, dedication and absorption Schaufeli et al. (2017). Schaufeli and Bakker (2004), Bakker and Leiter (2010), Bakker and Demerouti (2014) namely: (1) Vigor, among others, employee awareness to feel the energy, strength, desire to work; (2) Dedication such as finding meaning and purpose, enthusiasm for work, inspiration at work, pride in the work done, challenges at work; and (3) Absorption, namely assimilation in a dissertated job with a feeling of time that flies very quickly while working.

JP is measured based on the development of instruments from Winarno and Hermana (2019) with a focus on quality dimensions such as: (1) offering criteria for novelty in research (originality value); (2) the ability to create ideas, mobilize support for innovative ideas in research (new work methods, techniques or instruments); (3) get approval turning innovative ideas into useful applications in research; (4) make organizational members enthusiastic for innovative ideas in research; and (5) evaluating the application of innovation ideas in the context of lecturer research.

Computer-related technostress is measured based on sources, namely techno-overload, such as the availability of information relevant to accessible research and techno-complexity related to the inability to deal with technological complexity, especially with regard to sites that provide indexed references for research. (Tarafdar et al., 2007). The scale on the answers to the questionnaire uses a rating scale of 1 to 5 from the category such as never to always. Data analysis using SEM.

#### **4. Results and Discussion**

The description of JD-R research variables in terms of resources shows that Job resources are in a good category with varied values. Social support for conducting research is quite good even though the performance feedback from the institution is still weak. Autonomy and learning opportunities by utilizing information technology are very open, especially access to independent theoretical learning. Learning opportunities for applications that support research and learning about the research paradigm are very open through existing information technology media. However, the utilization of this probability is very limited at a score of 2.2 (very low). Personal resources such as self-efficacy obtained through social learning in the work environment are still lacking at a score of 2.7, especially learning from peers and leaders. Resources such as self-esteem are high enough with a lack of optimism specially to produce research with high acceptance rates from indexed journals. The level of resilience in conducting research is sufficient but the variety of skills that support research is still lacking. The lecturers on average have a general skill level. Only a small fraction of lecturers has a variety of specific skills that support research and are rarely owned by others.

The lecturers' WE level in work is quite good. Awareness of the existence of energy is still lacking. The level of dedication and feeling involved when carrying out research work is quite good with a scale of 3.6. Job performance which is measured in terms of the ability to create ideas offered in the development of theories, methods and innovative ideas to applications that are useful in research practice is still lacking at a score of 1.8. Enthusiasm for innovative ideas in research and evaluation of the application of innovation ideas in the context of research is still lacking. The level of computer-related technostress is quite high. The lecturers assessed that the availability of accessible information actually creates pressure (overloaded) and the inability to handle technological complexity, especially with regard to sites that provide indexed references for research using beall's list of potential predatory journals and publishers, as well as the national index from the Directorate of Education. Higher Education Ministry is still weak. The interaction between computer related stresses such as over loaded technology and technological complexity with optimization of the carrying capacity of resources to encourage WE.

The results of the model testing are shown in Figure 2 below.

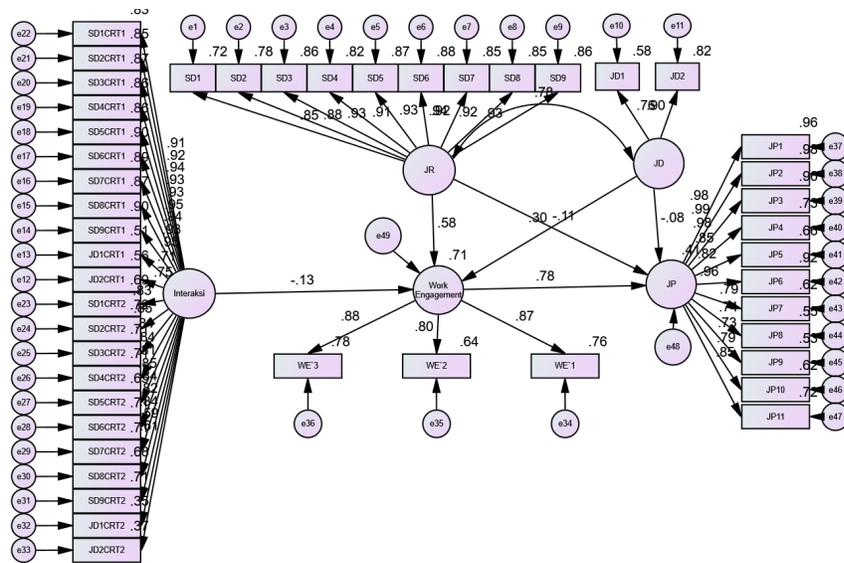


Figure 2: Model test results

Measurement model specifications are carried out first for both exogenous and endogenous constructs, namely the JD-R in line with Bakker and Demerouti (2014). Work engagement goes hand in hand with Utrecht Work Engagement Scale (UWES) with dimensions namely vigor, dedication and absorption as stated Schaufeli et al. (2017), Schaufeli and Bakker (2004), Bakker and Leiter (2010), Bakker and Demerouti (2014). For JP in line with Winarno and Hermana (2019).

The convergent validity test shows that the indicator validly measures what is actually being measured in the model. The factor weight value for each manifest variable is greater than 0.7. The value of the factor weight is significantly able to reflect the JD-R. The Average Variance Extracted value of the 11 indicators measured for the JD-R variable is 0.808, meaning that on average it is 80.8%. For WE, the Average Variance Extracted value of the three indicators is 0.73, which means that on average it is 73%. The Average Variance Extracted value for the JP indicator is 0.750, which means an average of 75%. The AVE value of computer related stress moderation variable is 0.723, which means that it is able to explain 72.3% of computer related stress in its interaction with JD-R. In general, the composite reliability value of the observed variable for each variable is greater than the recommended value, namely 0.70. The value of the Critical Ratio and the significance of the path coefficients (The Critical Ratio (CR) and the significance of path coefficients) are significant. The value of the crisis ratio (CR / t value) > 1.96.

The results of model identification indicate that the proposed model does not: (1) have odd numbers such as negative error variances; (2) the program is able to produce an information matrix through the results shown; (3) very low standard error; and (4) the correlation between the estimated coefficients obtained is at a moderate level. The results of this suitability test are in the form of goodness fit of statistics (GOF) values before and after improvements are shown in Table 1 below.

Table 1: Goodness of Fit Value

Good Orientation	Cut of Value	Test Result	Model Improvement Results	Conclusion
Significance of Probability	$\geq 0.05$	0.000	0.00	It is recommended to look at other fit indices
RMSEA	$\leq 0.08$	0.236	0.078	Fit
GFI	$\geq 0.90$	0.317	0.88	Moderate
AGFI	$\geq 0.90$	0.250	0.89	Moderate

Good Orientation	Cut of Value	Test Result	Model Improvement Results	Conclusion
CMIN / DF	$\leq 2$ or $\leq 3$	23,220	2.86	Fit
TLI	$\geq 0.95$	0.486	0.90	Moderate
CFI	$\geq 0.95$	0.512	0.97	Fit
PNFI	$> 0.6$	0.477	0.725	Moderate
IFI	$> 0.90$	0.513	0.83	Moderate

Source: primary data analysis results

Based on the results of testing the model in this study did not meet the fit criteria for cut of value. Model improvement is done by multiplying the relationship to produce a better GOF. The results of the improvement show that the RMSEA (indices to compensate for Chi-Square in a large sample), CMIN / DF, PNFI means that the model can be accepted based on the degree of freedom. The CMIN / DF value is 2.86, the value is between 2 and 3. The PNFI value is 0.725, which means that it is greater than the value determined as the cut-of value of the fit model. The PNFI value shows that the definition constructed by the researcher, including the indicators used in the study, is a definition and an indicator that can convey knowledge. Definitions are deemed better according to the way in which the terms (their variables and indicators) are usually used. The definitions and indicators used are able to articulate the concept with reality. The definition structure is formulated based on empirical references. Definitions have empirical indicators that have the potential to be conceptual indicators. The constructed definition produces a theory that can explain the phenomenon even though it has fewer parameters and a range of values. Each parameter is consistent with the theory referred to in this study.

To examine the relationship between latent variables in the research model, a structural model analysis was performed. The value of each relationship shows that it is significant. Hypothesis test results show that work engagement requires the support of work resources and personal resources. The variety of skills related to the applications used for research and learning opportunities is an important aspect that encourages work engagement. Endurance in facing obstacles in research and self-efficacy are personal resources that determine work engagement. Computer-Related Technostress reduces endurance as a personal resource but does not significantly reduce self-efficacy and increases the function of skills as a driver of WE.

Computer-Related Technostress is an important variable that needs attention. The complexity and the level of information overloaded can reduce the optimization of resource functions to support WE. Computer-Related Technostress Stress as a result of inability to adapt to changes and environmental demands. In order to solve this problem, the focus of HR practice is to increase understanding of Techno-overload and Techno-complexity and to implement strategies that boost lecturers' skills in ICT literacy. In line with Gugercin (2020) that employees may seek to neutralize the negative consequences of technology-induced stress by perform behavior that is not related to its function and role. Therefore, HR practices must focus on efforts to direct irregularities so that irregularities do not occur. Neutralizing pressure can be done by preparing lecturers to adapt to changes and technological demands. Nisafani et al. (2020) emphasized the need for strategic design in solving the technostress problem.

Therefore, understanding information technology literacy is very important. The functions of ICT literacy include reducing complexity and reducing overloaded information. Lecturers have the ability to learn to access various information networks that facilitate the productivity of knowledge and innovation together. Lecturers can optimize the availability of information, get feedback from their peers and enter the best ideas of innovation in cyberspace armed with ICT literacy skills. In line with Muñoz et al. (2016) that to reduce the anxiety level of high technology, increasing ICT skills is one of the answers.

Increasing ICT literacy enables lecturers to critically optimize their knowledge resources into research work with a shared platform globally, especially in relation to the development of research paradigms, research objects, epistemology, and axiology which are not only limited to research output but research processes. Improving ICT skills can be done through an independent learning process, heutagogy (self-determination and freedom of responsibility in learning) and paragoge (peers). The heutagogy process lies in improving the way of learning through double loop learning, especially in dealing with values, scientific beliefs to present the novelty of specific aspects based on available information. This process is non-linear, and is directed at the learner. Heutagogy provides a framework for the learning process that puts lecturers in charge and to be more independent in facing changes in information

technology. Heutagogy is an initiative for lecturers to improve ICT skills in dealing with technological complexities and overloaded information that causes stress.

#### 4.1 Research Limitations

This study only measures two dimensions of computer-related technostress variables. The main reach of respondents who live in big cities where private universities are located are West Java and Banten Indonesia Provinces. Research lecturer performance appraisal based on respondents' perceptions which can lead to bias. In the J-DR variable, the dimensions measured are social support, performance feedback, autonomy, and opportunity study. In the personal resource variable, the dimensions measured are self-efficacy, self-esteem, optimism, resilience, and skill variation. On the Job demand variable, the dimensions measured were work pressure and emotional demands.

#### 4.2 Availability of data and materials

The dataset used and analyzed during this study was sourced from primary data obtained through distributing questionnaires.

#### 4.3 Funding

Funding the research uses an independent research fund scheme (research funding sources from the researchers involved).

### 5. Conclusion

Job Resources Demand has an influence on job performance through work engagement which is moderated by Computer-Related Technostress. The theoretical implication is the need to explore factors that become resources to strengthen work engagement and job performance from the availability of information technology. The practical implication is to optimize the position of information technology as a support for work by introducing and practicing independent learning supported by existing information (heutagogy).

#### 5.1 Acknowledgements

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