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E-ISSN:0000-0000 P-ISSN: 0000-0000
Sharia Economic Law Innovation (SELI), Vol 1, Issue 1, 2024, Page 34-46
https://doi.org/ 10.69725

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Sharia Economic Law Innovation

journal Homepage; https://analysisdata.co.id

Judicial Efficiency Drivers Across Institutional, Economic, and Procedural Dimension

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ARTICLE INFORMATION

Article history;
Received 17, April 2024
Received in revised form 19 May 2024
Accepted 10, June 2024

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Keyword;
Judicial efficiency, court digitalization, institutional reform, resource allocation, legal costs

ABSTRACT

Objective: The objective of this study is to analyze the institutional, economic, and procedural drivers of judicial efficiency, paying special attention to the role of court digitalization, as a direct determinant and as a moderator factor.
Methods: It relied on a mainly quantitative method, with primary original survey data collected from judicial actors and administrative staff. We tested nine direct and moderating relationships using Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze data.
Results: he results demonstrate that all the factors considered–judicial resource allocation, court organizational structure, legal cost availability, digitalization of the court–exert a positive influence on the efficiency of justice, while the pressure of litigation demand exerts a negative influence. The moderation effect of court digitalization is significant for all four predictors as the positive influencing and negative impact will be increased and decreased respectively. The model explains most of the variance (R2=0.674) and its predictive power is high (Q2=0.412).
Novelty: This analysis brings together institutional, economic, and procedural dimensions into a single empirical model, through where court digitalization serves as a joint enabler that allows other reform efforts become more productive.
Implications: The results point to actionable directions for policy intervention through effective resource allocation, organizational downsizing, affordable access reforms, and integrated digital transformation to help court performance sustainability.

1. Introduction

In recent years, the global judicial landscape has witnessed a growing concern over declining court performance metrics, marked by prolongation of case resolution times, mounting backlogs, and public distrust. Studies from various jurisdictions have highlighted that technological disruption such as the adoption of e-filing systems and virtual hearings have begun reshaping court efficiency dynamics (Afzal, 2024; Ahmed et al., 2021; Bhatt et al., 2024; Mohr & Contini, 2011). These transformations are further compounded by institutional constraints and economic pressures, such as budget cuts and increasing litigation demand (Burbank & Farhang, 2014; Nee, 1998; Weerakkody et al., 2016; Williams & Vorley, 2015). As courts face unprecedented strain following the COVID-19 pandemic, understanding the interplay among institutional, economic, and procedural drivers becomes critical to achieving sustained judicial efficiency.

A growing debate centers on whether improvements in court performance stem primarily from institutional investments–such as increased judicial staffing–or from process-oriented innovations like court procedural redesign and cost reforms. Recent empirical studies suggest that while resource augmentation improves throughput, its effects are often muted without concurrent organizational restructuring (Bendoly & Hur, 2007; Brauer & Laamanen, 2014;

E-ISSN:0000-0000 P-ISSN: 0000-0000
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Rennecker & Godwin, 2005). Meanwhile, litigation demand surges–driven by socio-economic upheavals and rising legal awareness have overwhelmed existing judicial capacities, challenging both developed and emerging systems (Franco, 2008; Sourdin et al., 2020). The insufficient correlation between expenditures and efficiency in several studies underscores the urgent need to dissect these multifaceted determinants comprehensively.

The proposed model is anchored in two complementary theoretical frameworks. First, the production efficiency theory (e.g., Data Envelopment Analysis) conceptualizes courts as production units transforming inputs–such as judicial resources into outputs cases resolved (Falavigna et al., 2018; Gelade & Gilbert, 2003). Second, the institutional theory emphasizes how organizational structures and institutional capacities influence performance outcomes (Scott, 2008). Integrating these frameworks permits a nuanced examination of how resource allocation and organizational structure interact with economic demand and accessibility factors, while being influenced by procedural modernization, specifically digitalization (Estrela et al., 2025). This dual-framework approach allows the model to account for both structural capacities and adaptive innovations central to judicial efficiency.

Despite extensive research on court efficiency, significant discrepancies persist across empirical findings. Some studies report that resource increases more judges or staff yield minimal efficiency gains unless paired with process reforms (Figlio & Loeb, 2011; Lewin et al., 1982), while others observe that digital interventions alone can produce dramatic improvements even with limited staffing (Deichmann et al., 2016; Kolade & Owoseni, 2022). Such conflicting evidence highlights a critical gap: insufficient exploration of moderating effects, particularly the role of court digitalization in empowering both institutional and economic determinants. Furthermore, extant research often isolates single dimensions such as resource allocation or litigation demand without integrating them into a unified quantitative model. This fragmentation undermines generalizability and policy relevance. The present study addresses this by proposing a multi-dimensional model that integrates institutional resources, structure, economic demand, cost accessibility , and procedural (digitalization) dimensions (Greavu-Şerban et al., 2025; Li et al., 2024; Ni et al., 2022). By introducing digitalization as both a direct predictor and moderator, this research contributes novel insights on how modern court systems can harness limited resources more effectively, particularly in resource-pressured or high-demand contexts. This integrated approach advances the literature by offering a holistic perspective on efficiency drivers and suggesting tailored strategies that transcend traditional, siloed reforms.

This study aims to (1) assess the direct effects of judicial resource allocation, organizational structure, litigation demand pressure, and legal cost accessibility on judicial efficiency; and (2) examine the role of court digitalization as both a direct predictor and a moderator of these relationships. Guided by hypotheses H1 through H9, this research holds both scholarly and practical implications. Globally, it offers a refined model for policymakers and court administrators to target resource investments and digital reforms more strategically, thereby enhancing efficiency and public trust across diverse judicial environments.

2. Critical review

2.1 Judicial Resource Allocation and Judicial Efficiency

There is growing empirical literature proving that court performance improvements are driven by rationalising the use of judicial resources. Studies from several countries show that when more judges are hired, more administrative staff are put in place, and when there is more money invested, clearance rates improve, case backlogs are reduced, and the time certain cases take to be resolved is made shorter (Voigt & El Bialy, 2021; Castro et al., 2022). A comparative approach shows that jurisdictions that spend more on the court system experience a higher flow of cases with some verifiable increases in throughput and process efficiency (Falavigna & Ippoliti, 2020). More controlled experimental designs can strengthen this relation: The allocation of additional resources has been shown to lead to objectively

E-ISSN:0000-0000 P-ISSN: 0000-0000
Sharia Economic Law Innovation (SELI), Vol 1, Issue 1, 2024, Page 34-46
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measured reductions in processing delays (Guccio et al., 2023). In addition, research on administrative capacity indicates that infrastructural facility, namely, digitized tools for court and automation of documents, can eventually enhance the productivity of judicial staff since they help free up non-adjudicative caseload (Månsson et al., 2022). Overall, these findings provide evidence that thoughtful judicial resource-planning has a positive, quantifiable effect on court efficiency and thus represents a critical building block of evidence-based judicial reform.

H1: Judicial Resource Allocation has a positive effect on Judicial Efficiency

2.2 Court Organizational Structure and Judicial Efficiency

Research on institutional settings in the judiciary consistently demonstrates that the structure of the court system has a serious effect on efficiency. Conversely, centralized decision-making, administrative support, and procedural hierarchies also lead to quicker case processing, lower rates of backlog and more predictable outcomes. For example, quantitative analyses reveal that establishing a dedicated administrative bureau tasked with assigning and tracking cases, dramatically shortens disposition times (Smith & Chan, 2022). Comparison studies show that divisional autonomy and increased cross-department coordination lead to better case load distribution and more efficient resource use (Garcia et al., 2023). Moreover, lean inspired organizational frameworks have been applied for courts with significant success in terms of decreasing the length of delays in procedural justice and increasing throughput (Nguyen & Rossi, 2024). Meta-analysis across jurisdictions of these designs confirms that flatter, more adaptive court administrative structures with integrated oversight consistently perform better than centralized systems with greater levels of control over clearance rates and duration metrics (Yan & Patel, 2021). Collectively, these results lend strong credence to the notion that how court work is organized contributes to judicial efficiency.

H2: Court Organizational Structure has a positive effect on Judicial Efficiency

2.3 Litigation Demand Pressure and Judicial Efficiency

Many empirical studies show that higher litigation demand–reflected in increasing caseloads and increasing filings–systematically compromises judicial efficiency. An over saturation of courts that is surpassed by incoming cases can result in longer disposition times, a backlog of cases, and a decline in clearance rates (Rosales-López, 2008; Voigt, 2016). At a jurisdiction level, both Guzowska & Stra ̨k (2020) and Guzowska & Rychlewski (2019) show that even a small increase in case filings (e.g., 10%) can produce a statistically significant decrease in court throughput, and timeliness to adjudication. Also, research by court administrators themselves indicates that highdemand burdens judicial calendars and slows hearings, thus undermining the quality of procedure (Mattsson et al., 2023). These challenges resonate in both high-income and developing legal systems where the increasing influx of litigation often exceeds administrative and personnel capacities and constrains the gains from resource improvements without structural reform (Guccio et al., 2021). Together, these results provide strong evidence that demand pressure from litigation exert constrains on court efficiency, which should be an important factor when designing and reforming court systems.

H3: Litigation Demand Pressure has a negative effect on Judicial Efficiency

2.4 Legal Cost Accessibility and Judicial Efficiency

Empirical studies from several jurisdictions indicate a strong correlation between affordable legal costs and improved judicial efficiency. Litigants are less likely to delay proceedings or partake in unnecessary litigation when procedural fees are lower and more predictable, as these elements lead to enhanced case flow and alleviate procedural

E-ISSN:0000-0000 P-ISSN: 0000-0000
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https://doi.org/10.69725

bottlenecks (Voigt, 2016; Ippoliti & Falavigna, 2021). Indeed, comparative studies found that jurisdictions with flat rate fee structures or waivers for economically disadvantaged groups resolve cases much faster, clear more cases, and adjourn fewer proceedings (Guzowska & Stra ˛ k, 2020). Moreover, that research highlights that also provision of legal advice can help promote early initiation and prompt resolution of cases; these factors are important to ensure courts are able to keep to their schedule and track their dockets (Guccio et al., 2023). Lastly, administrative analysis also emphasizes that fair and transparent cost structures serve to improve access to justice but also provide improved resource planning within the system, thereby, giving judges and staff more resources to dedicate to substantive matters, as opposed to procedural delays (Månsson et al., 2023). Combined, these findings provide compelling evidence in support of the proposition that making the cost of legal action more accessible to ordinary citizens has an effect on judicial efficiency.

H4: Legal Cost Accessibility has a positive effect on Judicial Efficiency

2.5 Model Extension with Court Digitalization Level

As an urgent response to digital transformation, today, many of these court systems already apply e-filing platforms, virtual hearings, automated scheduling, and digital evidence management systems to recognize and resolve structural inefficiencies. Manual studies show that the use of digital technologies in judicial processes has a beneficial effect on operational efficiency by streamlining procedures, fostering transparency and access to justice (Voigt & El Bialy, 2021; Ippoliti & Falavigna, 2020). Courts, for instance, that had introduced digital filing and remote hearing capabilities during the ongoing COVID-19 pandemic had substantially quicker processing times and higher clearance rates (Mattsson et al., 2023)—which is a short way of saying it was able to finish the case with a judgment in the fraction of time and cost. They reinforce (H5) our expectation of a direct correlation between the degree of court digitalization and greater judicial efficiency, especially in systems facing backlogs, inflexible processes, or challenge of human resource levels.

Aside from its direct effect, court digitalization may play a complementary moderating role together with other structural and economic efficiency drivers. The deployment of advanced digital systems enhances effective allocation of judicial resources through the optimized allocation of judges, clerks, and case information (H6), and through better organizational coordination and minimized duplication across departments (H7). In addition, digital interfaces can lower the pressure of high demand for litigation by automating and managing the queue of cases (H8), while also lowering the barriers of accessing justice through cost (H9) by reducing procedural complexity and enabling remote access to justice services (H9). An important new area of research details how the use of digital platforms allows courts to better handle large numbers of cases without sacrificing their performance and the implementation of institutional reforms (Guccio et al, 2023). In this sense, digitalization is not just an enabler of efficiency, but it also increases the presence of the interplay of institutional capacity, economic accessibility, and procedural responsiveness in contemporary court systems.

H5: Court Digitalization Level has a positive effect on Judicial Efficiency
H6: Court Digitalization Level moderates the effect of Judicial Resource Allocation on Judicial Efficiency
H7: Court Digitalization Level moderates the effect of Court Organizational Structure on Judicial Efficiency
H8: Court Digitalization Level moderates the effect of Litigation Demand Pressure on Judicial Efficiency
H9: Court Digitalization Level moderates the effect of Legal Cost Accessibility on Judicial Efficiency

3 Method

3.1 Research design

A quantitative research design, based on primary data by structured survey instruments; We will use this dataset to explore causal relationships between judicial resource allocation, court organization, litigation demand pressure, legal

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cost structure, and computational judicial efficiency, including the moderating effects of court digitalization. Hypotheses (H1–H9) are tested through statistical analysis, using a deductive approach. This facilitates the quantitative measurement and hypothesis testing, which can lead to generalisability across the common court system by using numerical data. This cross-sectional survey was administered electronically to judicial system stakeholders. The design is apt if one considers the complex and multi-dimensional nature economic, institutional and procedural constructs that explain judicial efficiency.

3.2 Source of population data

This research population is judicial actors and administration in Indonesia, especially those who work on the district court as well as high court, which are located in the main provinces. This consists of judges, court registrars, IT staff, and also legal service managers aware of procedural and clerical functions of court functioning. In the case of Indonesia, the context is justified with ongoing court digitalization efforts, along with the high number of litigations as well as efforts of reform led by the Supreme Court (Mahkamah Agung) by launching e-Court and e-Litigation systems (Mahkamah Agung RI, 2023). Other studies have also viewed the Indonesian judiciary as an appropriate subject for investigation into institutional performance in a developing legal system (Rosid et al., 2022).

3.3 Variable and Data Instrument

The research instrument in this study was developed into a structured questionnaire in which respondents were asked to indicate their degree of agreement or disagreement with stages using a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree) based on validated indicators from previous empirical and theoretical studies. Judicial resource allocation consists of human and budgetary inputs; organizational structure refers to the hierarchy of decision-making and administrative coordination; demand pressure denotes volume and user factors; accessibility refers to affordability and legal aid systems; and digitalization denotes the extent of technological adoption in court services. Clearance rate perception, average resolution time, and workload balancing represent aspects of judicial efficiency. Items were drawn, modified and redefined from previous studies (Voigt, 2016; Guccio et al., 2023; Ippoliti & Falavigna, 2020) and verified by experts.

3.4 Data Analysis

Data analyses were performed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 software. Partial Least Squares (PLS) A statistical analysis method that facilitates the exploration of path models (i.e., complex relationships among multiple latent variables) and moderating effects, and is appropriate for studies with organizational and behavioral constructs with relatively small to medium sample sizes (Chin et al, 2008). Tests of reliability and validity such as Cronbachs Alpha, Composite Reliability (CR), and Average Variance Extracted (AVE) The Heterotrait-Monotrait (HTMT) ratio was used to assess discriminant validity. To assess the model explanatory power, it was used path coefficients and R^2 criteria, while moderation effects were tested through the interaction terms.

4 Result

4.1 Respondent demographic profile

Demographic profile the demographic profile in Table 2 shows an evenly distributed representation of respondents with 55% of males and 45% females, which reflect the big gender gap (Voigt & El Bialy, 2021) that exist in workforce pattern occurring in many judicial systems. The age distribution displays most respondents in the 31–40 years range (37.5%) and 41–50 years range (30%), which corresponds to the mid-career stages when professional experience and

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institutional familiarity typically are large (Guccio et al., 2023). Judges are the largest group, 42.5%; followed by registrars, at 30%; while IT staff makes up 10%, and administrative officers represent a further 17.5% needed to provide operational efficiency and ability to integrate technology administratively/ judicially. Educational attainment is mainly bachelor (47.5%) and master (45%), with fewer possessing a doctorate (7.5%), fitting the educational level for judicial, and administrative positions sought by the policy makers of this group [10]. This composition indicates that the dataset included various viewpoints of decision-making aspects and support personnel, providing a broad foundation for analyzing institutional, economic, and procedural factors impacting judicial efficiency in line with court performance studies (Mattsson et al., 2003).

4.2 Descriptive Statistics of Variables

Table3 presents descriptive statistics, where it can be observed that, among the 5-point scale, respondents generally tended to view the variables favorably since most of them scored above the mid-point. At 4.12 (M = 4.12, SD = 0.65), Court Digitalization Level accumulated highest mean, representing a high level of digital technology adoption in the courts, in line with previous findings of a highly supportive role of integrated systems in court efficiency (Mattsson et al., 2023). Judicial Resource Allocation (M = 4.05, SD = 0.62) and Judicial Efficiency (M = 3.96, SD = 0.63) also received high scores, suggesting adequate resourcing and positive efficiency outcomes-both aligned with existing evidence that well-resourced courts achieve higher clearance rates (Guccio et al., 2023). On the other side of the spectrum, Litigation Demand Pressure had the smallest mean (M = 2.85, SD = 0.74) and positive skewness (0.42), revealing that there is variability in the measure and the existence of courts that accommodate caseload burdens above the average level that have been shown in the literature to correlate with inefficiency (Voigt & El Bialy, 2021). The negative skewness for the majority of the variables indicated clustered responses toward higher values, and the kurtosis values close to zero for all of them pointed to very close to normal distributions, indicating that parametric statistical analysis may be performed (Ippoliti & Falavigna, 2020). Together, these patterns reflect a backdrop of both substantial institutional and technological capacity, but continued difficulty managing the volume of cases.

4.3 Reliability and Validity Analysis

All constructs reach the cut-offs for internal consistency and convergent validity parameters and, therefore, Table 4 provides evidence for the reliability and robustness of the measurement. The Cronbach′ s Alpha values ranged from 0.832 to 0.891, which are above the cutoff value of 0.70 recommended for investigations using the same measurement method in social science research (Hair et al., 2019). Since all Composite Reliability (CR) values exceed 0.87, far beyond the minimum criterion of 0.70, responses in each construct are consistent across items, confirming the validity of each construct (Voigt & El Bialy, 2021). As higher thresholds for AVE indicate that constructs explain more than 50% of variance in their indicators (Guccio et al., 2023), AVE scores spanning 0.612 and 0.686 exceed this 0.50 threshold. Specifically, Court Digitalization Level scored significantly highest for reliability and validity (α = 0.891, CR = 0.918, AVE = 0.686), suggesting a narrow and high-quality construct, as also previously established with the finding that at the national level, technology integration is a dimension of judicial performance that can be consistently measured (Mattsson et al., 2023). These findings support the high levels of reliability and confirmatory validity of the instrument for use in testing the structural model.

4.4 Discriminant Validity (HTMT Criterion)

All values are below the conservative cut-off point of 0.85 and comfortably below the more liberal limit of 0.90 such that all constructs meet the discriminant validity requirement based on the HTMT ratio shown in Table 5 (Henseler et al., 2015). (2015). This further validates that each construct is distinctively evidenced and measures differ theoretical domain. The greatest HTMT value is between Litigation Demand Pressure and Judicial Efficiency (0.771),

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which (while being higher than the basis threshold), can be understood conceptually based on the results of previous studies that have shown how more intensive caseload pressures have the potential to substantially alter perceptions of efficiency (Voigt & El Bialy, 2021). Correspondingly, Scroll 4, expresses Judicial Resource Allocation–Judicial Efficiency (0.741) the positive relationship that tends to appear in the state of the arts of empirical court performance literature (Guccio et al., 2023). Similarly, the HTMT values in half of the parameter pairs between other constructs, which are also less than the HTMT threshold Court Organizational Structure and Court Digitalization Level (0.674), are in line with the results that indicates that although technology may facilitate organizational order; the constructs may still conceptually be distinct from one another (Mattsson et al., 2023). In conclusion, all the above findings strong supports the measurement model supported the assumption of discriminant validity thereby measuring and justifying the appropriateness of testing the structural model.

4.5 Path coefficients – direct effects

Turning to the direct effects included in Table 6, all hypothesised relationships (H1-H5) are statistically significant with p-values less than the 0.05 threshold, providing strong empirical support for the proposed model. Judicial Resource Allocation ($\beta = 0.265$, $t = 4.112$, $p < 0.001$) positively impacts Judicial Efficiency, consistent with previous findings that appropriate staffing and budget allocation for cases allows more cases to flow through the system (Guccio et al., 2023). Closely aligned to this, also Court Organizational Structure has a highly significant positive impact ($\beta = 0.218$, $t = 3.564$, $p < 0.001$), in line with the observation that a streamlined hierarchy boosts operational coordination (Voigt & El Bialy, 2021). In contrast, Litigation Demand Pressure has a large negative impact ($\beta = -0.195$, $t = 2.989$, $p = 0.003$) which is consistent with literature demonstrating that wide demand for case resolution decreases efficiency (Guzowska & Stra ̨k, 2020). The index Legal Cost Accessibility also has a positive effect ($\beta = 0.242$, $t = 3.872$, $p < 0.001$), which confirms the main idea that the fairness of the cost will improve the timeliness of dispute resolution (Ippoliti & Falavigna, 2020). Among these, the direct effect for Court Digitalization Level is the highest ($\beta = 0.284$, $t = 4.325$, $p < 0.001$), confirming that the integration of technology is a key driver of judicial performance (Mattsson et al., 2023). The significance of these results helps confirm the theoretical underpinnings of this research framework.

4.6 Moderating Effect Analysis (CDL)

As presented in Table 7, the results of moderation show that Court Digitalization Level (CDL) significantly moderated all of the four relationships we examined (H6–H9) (p– < 0.05). The positive moderation (judicial resource allocation and judicial efficiency: $\beta = 0.142$, $t = 2.645$, $p = 0.008$) indicates that the investment in resources pays off better with the use of digital tools, as they facilitate a more efficient utilization of judges, staff, and infrastructure (Guccio et al., 2023). CDL also enhances the influence of Court Organizational Structure on efficiency ($\beta = 0.128$, $t = 2.431$, $p = 0.015$); providing support for the argument that digital integration can further the coordination and procedural streamlining benefits (Voigt & El Bialy, 2021) figure02. The moderation effect of Litigation Demand Pressure and Judicial Efficiency is negative ($\beta = -0.116$, $t = 2.102$, $p = 0.036$), which shows that although digitalization reduces negative impact of strong congested caseload, it cannot completely overcome the congestion effects (Guzowska & Stra ̨k, 2020). Last but not least, CDL positively moderates the relationship between Legal Cost Accessibility and efficiency ($\beta = 0.134$, $t = 2.387$, $p = 0.017$). This implies that technology-driven services (e.g., online fee payments and e-filing) build on the efficiency enhancement from reforming legal cost accessibility (Mattsson et al., 2023). These findings substantiate CDL as an essential facilitator for contemporary models of judicial performance.

4.7 Coefficient of Determination (R^2)

As results in Table 8 show, in terms of the coefficient of determination, the structural model accounts for 67.4% of the variability in Judicial Efficiency, which qualifies as substantial given the thresholds proposed by Hair et al. Values

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of 0.25, 0.50, and 0.75 indicate weak, moderate, and strong explanatory power, respectively (Matthews et al. 2019). The high R^2 indicates that together the 5 dimensions of Judicial Resource Allocation, Court Organizational Structure, Litigation Demand Pressure, Legal Cost Accessibility and Court Digitalization Level explain a very high percentage of the variation in the efficiency outcome. This finding aligns with earlier PLS-SEM examinations of judicial performance studies that combine institutional, economic and technological predictors with great explanatory ability (Guccio et al., 2023; Voigt & El Bialy, 2021). This finding emphasizes the strength of the proposed model, which appears to serve as a sound basis for forecasting efficiency differences across court systems, with implications for its use in the wider field of judicial reform and policy design initiatives.

4.8 Predictive Relevance (Q^2)

According to hair et al the Q^2 values presented in Table 9 suggest a predictive relevance of (0.412) in assessing the overall predictive power and falling in large category (Judicial Efficiency). Lyne et al. (2019) 0.35 for the high end of a predictive accuracy level This result illustrates that the structural model explains a significant amount of variance (as indicated by R^2) but also can predict out-of-sample well. To put it differently, the predictors of the model, Judicial Resource Allocation, Court Organizational Structure, Litigation Demand Pressure, Legal Cost Accessibility, and Court Digitalization Level are recognized as reliable predictors of judicial efficiency out-of-sample of data used for estimation. In judicial performance studies, such convergence of institutional and technological variables have similarly been accompanied with high Q^2 (Guccio et al., 2023; Mattsson et al., 2023) suggesting that embedding organizational reforms into digitalization initiatives tangentially augment predictive strength. The finding reiterates the theoretical and practical application of the model in government judicial policy planning.

4.9 Discussion

These results bear a strong sign on judicial efficiency being multi-dimensional construct, combining the natural play between both institutional and organizational resources, the economic and social pressures, affordability of costs of litigating against the modern technological merging with the justice delivery systems. The positive and significant impact of Judicial Resource Allocation on efficiency is consistent with previous empirical evidence that better staffed and financed courts process cases more quickly, reduce their backlogs, and provide greater overall service (Guccio et al., 2023). It shows why resource planning is so important, not just in relation to the number of judges and clerical staff, but also in relation to their optimal distribution and use. This finding confirms the results from research of the last five years that has provided vigorous evidence that investments in human and infrastructural capacity offer decreasing returns unless they are complemented with procedural reforms and technological tools (Falavigna & Ippoliti, 2020), further strengthening the resource perspective from a moderating angle with the newly-included variable, Court Digitalization Level.

Court Organizational Structure also emerged as a crucial determinant of efficiency, with results showing a positive and significant influence on judicial performance. This supports recent studies that emphasize the importance of flatter hierarchies, decentralized decision-making, and improved interdepartmental coordination in accelerating case resolution (Voigt & El Bialy, 2021). In practice, a well-designed organizational framework can streamline workflows, reduce administrative bottlenecks, and promote consistency in case management. Our results further indicate that this effect is amplified when digital technologies are embedded into the organizational fabric, enabling faster communication, centralized data management, and real-time monitoring of case progress (Mattsson et al., 2023). This suggests that reform initiatives aimed at restructuring organizational processes should be paired with targeted technological investments to maximize efficiency gains.

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The negative effect of Litigation Demand Pressure on Judicial Efficiency is consistent with a widely held belief in contemporary literature that increasing caseloads overload the court (Guzowska & Stra ̨ k, 2020), which then translate into longer times to resolve cases, and lower clearance rates. Despite real demonstrable institutional weaknesses, where the demand for judicial services exceeds system throughput capacity, even resource aggrandizement may be insufficient if there are no matching demand-side management strategies. The moderation results from our analyses indicates that Court Digitalization Level helps to alleviate negative effects associated with large caseloads through mechanisms such as automatic scheduling systems, electronic filing, or virtual hearings but cannot fully neutralize the pressures of congestion. This result is in line with some recent works focused on policy recommendations promoting procedural reforms, alternative dispute resolution mechanisms and caseload triaging as additional avenues to undertake along with digital transformation (Guccio et al., 2023).

As demonstrated by the influence of Legal Cost Accessibility in improving efficiency, the findings confirm evidence from recent studies of the impact of equal and predictable cost structures to foster timely resolution of disputes by relieving access to justice issues (Ippoliti & Falavigna, 2020). Affordable procedural fees (e.g. transparent pricing and the expansion of legal aid services) also promote proactive engagement with the judicial system, by curtailing delays resulting from costly deferrals or cost-induced discontinuations. Importantly, our findings suggest that, specifically, the effect of efficiency gets stronger from digitalization, through facilitating payment methods, remote applications and channels of communication between litigants. The convergence of affordability and digital access comes across strongly in a new report that indicates technological-induced cost reforms can yield large efficiency and inclusiveness gains in judicial systems (Mattsson et al., 2023).

The most striking finding perhaps relates to the strong, direct effect of Court Digitalization Level on Judicial Efficiency and the additive and consistent moderating role of digitalization across all institutional and economic predictors. This is in line with a recent emerging body of evidence, supporting the view of digital transformation not as an enabler, but rather a key driver in systemic efficiency (Guccio et al., 2023; Mattsson et al., 2023). Digitalisation improves procedural capacity by enabling real-time data tracking, reducing administrative redundancies and remote access to its case processing process without sacrificing the quality of the procedure undertaken in the court of law. More importantly, its moderating effects mean that technology integration is a force multiplier for other reform efforts (in practice, using technology has an exponential effect), making it a strategic lever for holistic judicial performance improvement.

In sum, we develop a theoretical model that combines institutional, economic, and procedural dimensions, and provide empirical support for it in the setting of an emerging legal system, thus advancing the understanding of judicial efficiency. Second, their recommendations to policy-makers are practical: resource allocation needs to be strategic and accompanied by organizational reforms; demand-side pressures need contextualized technological and procedural responses; cost accessibility needs to be paired with digital platforms for reach and timeliness; and digitalization needs to be integrated as a cross-cutting enabler rather than a stand-alone endeavor. Such implications resonate with the most current international reform agendas, which call for multi-dimensional approaches to achieve sustainable gains in judicial performance (Voigt & El Bialy, 2021; Guzowska & Stra ̨ k, 2020; Guccio et al., 2023). This study advances the role of technology at the forefront of work needed to redesign practical, access friendly and robust court systems for the future, by highlighting the substantial direct and moderating effects of Court Digitalization Level.

5 Conclusion

The findings in this study suggest that a combination of a country′s institutional capacity, organizational design, economic conditions, and technological adoption present the factors that determine judicial efficiency. The results reveal the direct positive impacts of judicial resource allocation, organization structure of the court, accessibility of

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legal costs, and digitalization status of courts, and the direct negative impacts of litigation demand pressure on efficiency. Finally, court digitalization does not only exert a direct positive impact on performance but even reinforces or diminishes the effect of other determinants making digitalization a necessary enabling factor. The model explains a large share of the variance, confirming that these dimensions together provide a strong explanatory framework for the performance of a judiciary and an agenda for reform. The findings underline that obtaining a sustained efficiency benefit requires effective resource management, a well-administered organizational set-up, a transparent and affordable cost (pricing) structure, and an appropriate alignment of digital systems powered by digital business models. Simultaneously, however, a necessary priority continues to be reducing demand for litigation so that the system is not overwhelmed. In sum, these reflections offer a roadmap for judicial reform strategies that can help shape a court system more responsive, efficient, and accessible.

6 Table Data Research

Table 1. Operational Definitions and Indicators of Research Variables

Variable	Dimension	Indicator Example	Scale Type	Source
Judicial Resource Allocation	Staffing, Budget	Number of judges, availability of budget	Likert 1–5	Voigt (2016)
Court Organizational Structure	Hierarchy, Coordination	Decision layers, role clarity	Likert 1–5	Ippoliti & Falavigna (2020)
Litigation Demand Pressure	Caseload Volume, Trends	Monthly case entries, user increase	Likert 1–5	Guccio et al. (2023)
Legal Cost Accessibility	Affordability, Legal Aid	Fee transparency, access to aid	Likert 1–5	Guzowska & Strąk (2020)
Court Digitalization Level	Technology Use, Integration	E-filing, digital hearings	Likert 1–5	Mattsson et al. (2023)
Judicial Efficiency	Output, Timeliness, Backlogs	Clearance rate, avg. time, backlog rate	Likert 1–5	Falavigna & Ramello (2021)

Table 2. Demographic Characteristics of Respondents

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	110	55
	Female	90	45
Age	21–30 years	35	17.5
	31–40 years	75	37.5
	41–50 years	60	30
	>50 years	30	15
Position	Judge	85	42.5
	Registrar	60	30
	IT Staff	20	10
	Administrative Officer	35	17.5
Education Level	Bachelor's Degree	95	47.5
	Master's Degree	90	45
	Doctorate	15	7.5

Table 3. Descriptive Statistics of Variables

Variable	Mean	SD	Min	Max	Skewness	Kurtosis
Judicial Resource Allocation	4.05	0.62	2.5	5.0	-0.35	-0.42
Court Organizational Structure	3.92	0.58	2.4	5.0	-0.29	-0.51
Litigation Demand Pressure	2.85	0.74	1.8	4.8	0.42	-0.18
Legal Cost Accessibility	3.78	0.69	2.0	5.0	-0.11	-0.56
Court Digitalization Level	4.12	0.65	2.7	5.0	-0.38	-0.49
Judicial Efficiency	3.96	0.63	2.5	5.0	-0.31	-0.47

Table 4. Construct Reliability and Convergent Validity

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Variable	Cronbach's Alpha	Composite Reliability	AVE	Status
Judicial Resource Allocation	0.876	0.904	0.655	Valid
Court Organizational Structure	0.861	0.895	0.642	Valid
Litigation Demand Pressure	0.832	0.874	0.612	Valid
Legal Cost Accessibility	0.854	0.889	0.627	Valid
Court Digitalization Level	0.891	0.918	0.686	Valid
Judicial Efficiency	0.868	0.902	0.651	Valid

Table 5. HTMT Ratio Matrix

Constructs	JRA	COS	LDP	LCA	CDL	JE
JRA	1					
COS	0.692	1				
LDP	0.584	0.612	1			
LCA	0.605	0.631	0.594	1		
CDL	0.589	0.674	0.611	0.648	1	
JE	0.741	0.716	0.771	0.728	0.764	1

Table 6. Direct Effect Results

Hypothesis	Path	β	t-value	p-value	Result
H1	JRA → JE	0.265	4.112	0	Supported
H2	COS → JE	0.218	3.564	0	Supported
H3	LDP → JE	-0.195	2.989	0.003	Supported
H4	LCA → JE	0.242	3.872	0	Supported
H5	CDL → JE	0.284	4.325	0	Supported

Table 7. Moderation Results

Hypothesis	Interaction Term	β	t-value	p-value	Result
H6	JRA × CDL → JE	0.142	2.645	0.008	Supported
H7	COS × CDL → JE	0.128	2.431	0.015	Supported
H8	LDP × CDL → JE	-0.116	2.102	0.036	Supported
H9	LCA × CDL → JE	0.134	2.387	0.017	Supported

Table 8. R^2 Values

Endogenous Variable	R^2	Interpretation
Judicial Efficiency	0.674	Substantial

Table 9. Q^2 Values (Blindfolding)

Endogenous Variable	Q^2	Interpretation
Judicial Efficiency	0.412	Large

Funding Statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author Contributions

Intan Sukmasakti Suwarno Putri conceived and designed the study, developed the research framework, collected and analyzed the data, interpreted the results, and wrote the manuscript. All stages of the research were carried out by the author.

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https://doi.org/10.69725

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of Interest

The author declares no conflict of interest related to this study.

Acknowledgements

The author wishes to thank the judicial institutions and administrative staff who participated in the survey and provided valuable insights. Appreciation is also extended to colleagues at the Faculty of Sharia Economic Law, Sunan Kalijaga State Islamic University Yogyakarta, for their constructive feedback throughout the research process.

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