Journal of Applied Science, Engineering, Technology, and Education *ISSN: 2685-0591 (online)*
Vol. 7 No. 3 (2025)
https://doi.org/10.35877/454RI.asci4192

Organizational Agility Based on Automatic Patch Work Behavior in the Era of Environmental Uncertainty

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Abstract

This study focuses on modeling organizational agility based on a synthetic construct, namely automatic patch work behavior which is proposed, conceptualized, and confirmed with theoretical validation, empirical validation, and nomological validation. The research model involved 219 respondents from Statistics Indonesia (Badan Pusat Statistik/BPS) employees in the West Sulawesi Province through cluster sampling techniques accompanied by eligible control of inclusion and exclusion samples, data were obtained using an e-questionnaire in December 2024. Structural equation modeling analysis confirmed the study's ability to present theoretical contributions in the field of strategic human resource management, positioning automatic patch work behavior as a new entity which means that automatic patch work behavior has the opportunity to connect work behavior to organizational agility in an era of environmental uncertainty. Practical implications are identified through the relationship between automatic patch work behavior directly and through the mediation of employees' dynamic capabilities and employee agility, which encourages increased organizational agility. Research on a synthesis concept combined with other established concepts, in general, the research conducted should be applied and expanded in scope, both in government agencies (institutions with service and accessibility characteristics) and in business companies (organizations with characteristics to maximize profits and welfare), so that the generalizations obtained have theoretical and practical implications in a representative and comprehensive manner.

Keywords: automatic patch work behavior, employees' dynamic capabilities, employee agility, organizational agility.

Received: 29 July 2025 Revised: 20 September 2025 Published: 31 December 2025

1. Introduction

Organizations are influenced by many factors including technological advances, societal shifts, and geopolitical changes. In dynamic conditions, employees will continue to face innovation, complexity, and change to achieve personal goals and maintain their relevance in challenging conditions (Dima et al., 2021). Human resource trends will reflect the changing nature of work, education, and skills required across eras, so that human resources will continue to evolve in response to technological, economic, and social changes (Shet, 2024).

Integration of job redesign, skill reapplication, and skill enhancement through the implementation of technology acceptance behavior and readiness to change influences the development of employee responsiveness and organizational agility (Jamal et al., 2024). Through the implementation of a management information system that functions to assist strategic planning, operational control, transaction processing, and administrative control, it will have an impact on the organization and its characteristics, where agility is one of the characteristics that organizations need in conditions of environmental uncertainty that are volatile and then provide opportunities for organizations to respond quickly, environmentally friendly, and at the same time increase their efficiency (Mohammed et al., 2024).

Implementation of work behaviors such as personal and interpersonal relationships, communication, knowledge management, capacity building and employee diversity has an impact on increasing employees' dynamic capabilities at the macro organizational level (Gheitarani et al., 2023). Organizations must commit to improving digital capabilities, utilizing the latest digital technologies, strengthening organizational learning, fostering a positive

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competitive climate, and focusing on developing employees' dynamic capabilities to enhance the organization's competitive advantage (Wang, Niu, et al., 2024). Work behaviors such as sense of belonging in the workplace, supervisor safety, creativity, and willingness to accept organizational change have a big effect in explaining and understanding resilient employee agility which provides opportunities for employees to succeed in adapting to rapidly and effectively changing environments and contexts within an organization (Prieto & Talukder, 2023).

Many organizations have disappeared due to their inability to adapt to change, therefore organizations that thrive with knowledgeable employees but without change-oriented employees will not be able to survive in dynamic environmental uncertainty, thus organizations must also focus on developing employee agility that supports organizational agility in a sustainable manner (Das et al., 2023). In this context, this study will deeply confirm the proposed synthetic construct with the characteristics of the construct being automatic in implementing knowledge and skills updates, business process updates, and information technology updates which are elements of employee work behavior and can be validated in relation to other constructs. If the review only focuses on the relationship of the synthetic construct, namely automatic patch work behavior in increasing organizational agility, it may oversimplify the problem model, therefore a combination will be carried out with other constructs such as encouraging employees' dynamic capabilities and employee agility in increasing organizational agility in the era of environmental uncertainty with justification and empirical phenomena from previous research.

2. Literature Review and Hypothesis Development

The synthetic concept of Automatic Patch Work Behavior (APWB), with the following procedures: (1) is a derivation of Resources Based Theory (RBT), namely sustained competitive advantage comes from the acquisition and use of a set of resources that are effective and cannot be imitated by competitors (Barney, 1991). Ten years later (Barney et al., 2001), explains that only strategic resources (heterogeneous and immobility) can achieve sustainable competitive advantage if they are focused or meet the competency criteria: valuable, rare, immitable, and organization (VRIO); (2). On the right side of Figure 1, the RBT theory is derived into Adaptive Structuration Theory (AST) which is a framework for examining differences in organizational change that occur when advanced innovative technologies are used (the interaction of advanced information technology, social structure, and human interaction) (DeSanctis & Poole, 1994); (3). Referring to the definition of AST, we were then inspired to borrow or use the information technology concept, namely the patch management system, which is the activity of repairing, patching and updating software routinely and continuously (Colarik et al., 2004); (4). This is then translated into the concept of automatic patch generation, which is an activity in searching for a candidate patch space, including the volume or size of the search space and the continuous arrangement of its navigation to produce and validate candidate patch spaces until the candidate patch space is able to pass all the cases tested until the original patch is produced (Kim & Kim, 2019), if it is connected with management science, this means that the concept is aimed at automatically patching or filling in the gaps related to strategic HR management practices (there is a chance that terms from the information technology concept can be used in the management science concept), thus through empirical analysis (using the information technology concept to produce a management science synthesis concept) the element of "automatic patch" is obtained.

The next step (5). On the left side of Figure 1, the RBT theory is derived into Human Capital Theory which explains that human capital is an investment that is not in physical form, such as: education, training, health, lectures on virtue, as well as honesty and punctuality (Becker, 1994); (6). Referring to the definition of human capital theory, it is then inspired by the concept of human resources advantage, which is an effort to build unique human resource competencies over a significant period of time, so that superior human resource practices and processes are used to align the interests of employees and the organization (Boxall, 1996); (7). This is then translated into the concept of innovative work behavior, which is free behavior and is not included in the job description rules, which consist of forming ideas, promoting ideas, and realizing ideas (Janssen, 2000), with the definition that employee behavior is a tendency to influence the operational performance of an organization with effective applications that originate from the knowledge, skills and technology possessed to produce innovative initiatives with the aim of increasing the competitiveness of the organization (Shanker et al., 2017), Thus, the element of "work behavior" is obtained. Therefore, the combination of the automatic patch element obtained from the concept of information technology and the work behavior element from the concept of management science is empirically able to produce the proposed synthetic construct, namely the concept of "automatic patch work behavior".

The dimensions of the synthesis construct are an integral part of the development of the conceptualization of its proposition, namely: from the concept of innovative work behavior (Janssen, 2000), related to the formation of ideas

as a representation of activities in building knowledge and skills and the promotion of ideas as a representation of the capabilities and collaboration of knowledge and skills in work, both of which can be reflected as the dimension of "implementation of knowledge and skills updating" and the realization of ideas as a representation of creativity and new ways in the work process is reflected as the dimension of "implementation of business process updating". Furthermore, in the concept of automatic patch generation (Kim & Kim, 2019), related to the analysis of searching for the volume or size of the prospective patch space and its navigation until the original patch is produced, it inspires to be reflected as the dimension of "implementation of information technology updating". Thus, the proposition is obtained that automatic patch work behavior is an activity of implementing updates to integrate work behavior as an effort to increase the added value of the organization through the implementation of knowledge and skills updating, the implementation of business process updating, and the implementation of information technology updating.

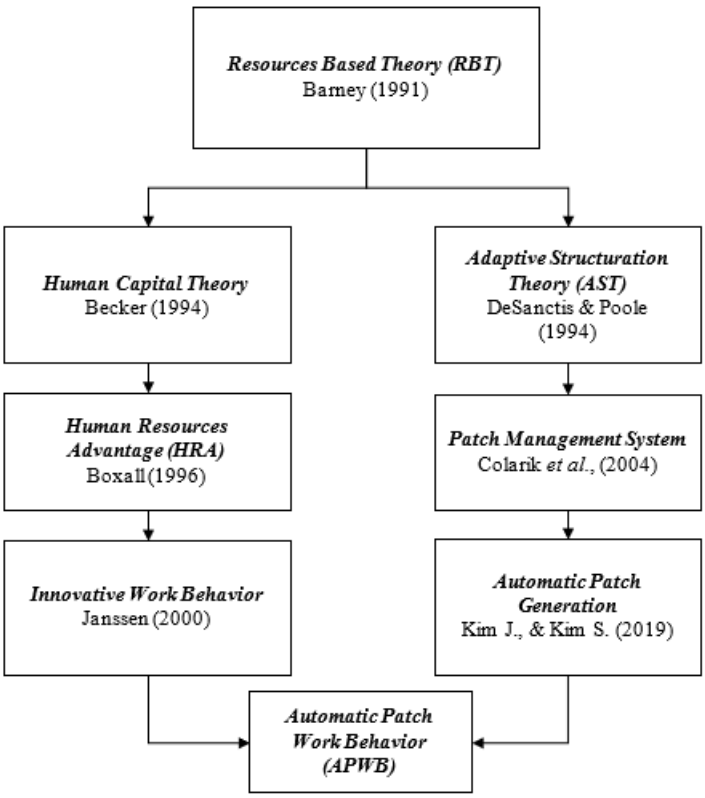

Fig. 1. Synthesis of the Automatic Patch Work Behavior Concept

Derivation into its indicators from the implementation dimension of knowledge and skills updating through adoption of the results of previous research, namely: knowledge-based innovation is intended as a series of processes regulating the creation, dissemination, storage and use of knowledge to improve organizational performance (Bastos dos Santos et al., 2024), data-based knowledge innovation capabilities can increase organizational agility and competitive advantage (Alghamdi & Agag, 2024), referring to this description provides an opportunity to produce an indicator of "implementing knowledge-based innovation updates." Business analysis capabilities and skills influence organizational innovation and its innovative performance (Abubakar et al., 2024), developing strategic agility through skills innovation will support responsibility to external and internal demands in managing dynamic organizational operations (Jooss et al., 2024), this description opens up the opportunity to propose an indicator for "implementing skills-based innovation updates".

Likewise, the dimensions of business process update implementation are derived into indicators obtained through a review of previous research results, namely: services with incomplete databases will make consumers reluctant to adopt the services provided because they result in service adoption that impacts the need for secondary actions, such as visits to government offices to complete service requests (Rana et al., 2015), simplifying organizational strategies with an approach to aligning quality management to effective service strategies will align consumer needs with the position and service strategy of the organization (Kamvysi et al., 2023), so the indicator "implementing organizational service simplification updates" is proposed. Relevant business processes will shape the feasibility and capacity of

government services based on information and communication technology as well as online data accessibility remains safe and intact regarding its confidentiality, and can be utilized by as many consumers as possible (Joshi & Islam, 2018), organizations with accessibility of value-added services (servitization) can encourage competitive advantages to improve consumer relations in a dynamic environment facilitated by technological advances (Vandermerwe & Erixon, 2023), by replicating this description, the indicator "implementing updates to organizational accessibility development" is obtained.

The indicators derived from the dimensions of information technology upgrade implementation through the findings of previous empirical studies, namely: integrating disruptive technology into an organization will increase employee skill empowerment, develop new strategies to improve network capabilities, and enable exploration and utilization of organizational opportunities (Scuotto et al., 2023), the implementation of the latest technology values can be used in tracking and monitoring performance, automating processes, and simplifying operations (V K et al., 2024), the description provides an opportunity to propose an indicator of "implementing relevant technology upgrades". Increasing consumer trust in organizational information by prioritizing institutional values can result in higher support for the management of an organization (Stuart Carlton et al., 2023), organizations must have different competitive features to compete in today's unpredictable era. Agility is one of the characteristics that organizations need in environmental uncertainty that allows organizations to respond quickly and environmentally friendly while increasing their efficiency, where information systems are one of the factors that impact organizational agility (Mohammed et al., 2024), referring to this empirical description opens up the opportunity to propose an indicator of "implementing reliable information updates".

The development of an empirical research model with a focus on organizational agility based on the synthetic construct of automatic patch work behavior through integration with other coherent constructs, is described as follows: the construct of continuous learning and the construct of innovative work behavior are characteristics related to the construct of employee agility (Salmen & Festing, 2022), innovation is a feature of organizational agility, where innovation is inherent in employees who carry it out, thus connecting employee agility with organizational agility (Felipe et al., 2016; Harsch & Festing, 2020), thus opening up opportunities to include the construct of "employee agility" in the model. In scientific references, agility is aligned with dynamic capability which is defined as the quality of sensitivity or the ability to quickly recognize various opportunities and threats, problem solutions, and the ability to change in the arrangement of the "resource base" (Kasali, 2015), strong dynamic capabilities are needed as a driver of organizational agility to overcome deep uncertainty, as organizations do in innovation and dynamic competition (D. Teece et al., 2016), therefore there is an opportunity to include the construct of "employees' dynamic capabilities" in the model. Based on the description, the constructs used in the research model are: automatic patch work behavior integrated with employee agility and employees' dynamic capabilities in driving increased organizational agility.

2.1. Automatic patch work behavior and Organizational agility

Organizational agility is the capacity associated with rapid, systematic, and sustainable evolutionary adaptation and entrepreneurial innovation aimed at achieving and maintaining competitive advantage in conditions of environmental uncertainty (Baškarada & Koronios, 2018; Darvishmotevali et al., 2020; Salmen & Festing, 2022). Because "automatic patch work behavior" is a newly proposed synthetic concept, the literature review used a proxy with the concept of "work behavior" in general, as previously argued by researchers: unique behaviors such as feelings of higher innovation ability and higher adaptability to new work situations can increase organizational agility (Jacobs et al., 2017). Employee behaviors including testing products quickly, working iteratively, learning from mistakes, collaborating with other departments and consumers, critical reflection, and transparency enhance organizational agility (Baran & Bible, 2019). There is alignment in the implementation of employee work behavior towards the dynamic capability perspective, namely: sensing, searching, seizing, shifting, and shaping which are indicators of organizational agility (Baškarada & Koronios, 2018).

H1: automatic patch work behavior will be positively related to organizational agility

2.2. Automatic patch work behavior and Employees' dynamic capabilities

Employees' dynamic capabilities are the ability of employees as a multidimensional role in integrating, building, and reconfiguring their competencies both internally and externally to cope with environments with rapid change (Bieńkowska & Tworek, 2020; Eisenhardt & Martin, 2000; Pulakos et al., 2000; D. J. Teece et al., 1997). Employees'

dynamic capabilities can adapt the behavior of fear and anxiety in strategic decision making under conditions of high uncertainty (Nagel, 2016). The development of sustainable employee behavior is related to dynamic capabilities as employee sensitivity to environmental changes, adaptability to environmental changes, and abilities that play a role in solving problems, as well as development and learning (Bieńkowska & Tworek, 2020).

H2: automatic patch work behavior will be positively related to employees' dynamic capabilities

2.3. Employees' dynamic capabilities and Organizational agility

Developing adaptable employees, able to face unexpected and dynamic changes in the organizational environment, is something that is very much needed for organizational agility (Sherehiy & Karwowski, 2014). Dynamic capabilities related to digital technology have the potential to mobilize resources, select open innovation partners, and configure distribution channels as organizational agility (Conboy et al., 2020). Dynamic capabilities by utilizing digital technology allow organizations to recombine resources, reengineer operations and business processes, and manage knowledge as strategic agility (Mikalef et al., 2021).

H3: employees' dynamic capabilities will be positively related to organizational agility
H4: employees' dynamic capabilities will mediate the relationship between automatic patch work behavior and organizational agility

2.4. Automatic patch work behavior and Employee agility

Some studies refer to taskforce agility, but in this study it is called employee agility with the intention of defining or conceptualizing the dynamic lens in the theory of person-environment fit (Salmen & Festing, 2022). Employee agility is the ability to respond to dynamic changes in conditions through a combination of proactivity, flexibility, and employee resilience that drives organizations to perform better, achieve competitive advantage, and advance the organization's reputation (Das et al., 2023; S. B. Doeze Jager-van Vliet et al., 2019; Tessarini Junior & Saltorato, 2021). Employee work behaviors such as collaboration, cooperation, and knowledge sharing are factors related to employee agility (T. J. Braun et al., 2017). Employee behavior has a positive impact on employee agility through the use of the latest information technology, such as the use of social media, which has a positive impact on employee work agility and communication agility in an organization (Bala et al., 2019; Pitafi et al., 2020).

H5: automatic patch work behavior will be positively related to employee agility

2.5. Employee agility and Organizational agility

Employee agility such as flexibility and adaptation are prerequisites for achieving agile manufacturing and likewise for organizational agility (Asari et al., 2014). The relationship between employee agility and the organization can be further explained through the application of innovation as a feature of organizational agility, which in turn is highly dependent on its employees, namely employee agility operates in a turbulent environment shaped by innovation requirements (Felipe et al., 2016),

H6: employee agility will be positively related to organizational agility
H7: employee agility will mediate the relationship between automatic patch work behavior and organizational agility

3. Method

3.1. Participant and Procedures

This study focuses on the concept of automatic patch work behavior synthesis, the research locus is conducted in a government organization, namely Statistics Indonesia (Badan Pusat Statistik/BPS) in the West Sulawesi region, this study can basically be conducted in both government and private organizations (companies). The sampling frame is formed based on a set of BPS work units by region (district BPS and provincial BPS), where the characteristics between work units are homogeneous (the main tasks and functions of each work unit are all the same, namely conducting surveys and censuses on population, economy, and agriculture on an ongoing basis, only the volume or quantity of work is different) and in each work unit is heterogeneous (education, skills, and culture of its employees are diverse) thus the population consists of a set of clusters (one BPS work unit is one cluster) referring to these characteristics, this study uses cluster sampling techniques (Berndt, 2020).

Although statistical generalization to a larger population (from regional BPS to BPS Indonesia) is not always possible, considering the homogeneity of the work units, this study offers the opportunity for analytical generalization

to the population. This is consistent with previous research that, in an organizational context, the perception of homogeneity among members within a work unit allows for the aggregation of individual data into a representation of the unit as a whole. Therefore, when work units are homogeneous, there is a strong opportunity for analytical generalization to the study population (M. T. Braun et al., 2021).

This study uses Structural Equation Modeling (SEM) analysis, determining the number of elements or sample units in the selected cluster based on the use of general guidelines that recommend a minimum sample size of 200 or 5-20 times the number of parameter (Kline, 2005; Sanglee et al., 2019). In this study, referring to all indicator and construct paths, there are 27 estimated parameters (5 parameters between constructs plus 22 parameters between indicators and constructs), so the total sample is 216 (5-20). Furthermore, to obtain an eligible sample, inclusion criteria were applied, namely employees who are active in technical and administrative work, while exclusion criteria were employees as cleaning service and security guards.

Table 1. Number of eligible samples

Work unit (Cluster)	Employees	Employees (*Cleaning service* dan Security guards)	Sample eligible (2) – (3)
(1)	(2)	(3)	(4)
BPS of West Sulawesi Province	69	12	57
BPS of Majene Regency	29	5	24
BPS of Polewali Mandar Regency	39	5	34
BPS of Mamasa Regency	32	5	27
BPS of Mamuju Regency	40	5	35
BPS of Pasangkayu Regency	31	5	26
BPS of Mamuju Tengah Regency	21	5	16
Number	261	42	219

Based on the practical techniques that have been described in the minimum SEM sample calculation above as well as field facts, the number of samples used in this study is 219 employees.

3.2. Measures

This study used four constructs: automatic patch work behavior, employees' dynamic capabilities, employee agility, and organizational agility. All items within each construct were answered on a 10-point Likert scale ranging from 1 (strongly disagree) to 10 (strongly agree), with the consideration of increasing the discrimination power between respondents, namely being able to distinguish variations in perception in more detail (Dawes, 2008), it is more suitable for research that requires higher sensitivity and discrimination power of answers (Taherdoost, 2019).

Before conducting the actual field data collection, in October 2024 a pilot study was first conducted on 35 respondents (5 respondents according to the work unit). This was intended to test the validity and reliability of the instrument (questionnaire) that would be used (Sekaran & Bougie, 2016).

Table 2. Validity and Reliability of the items building each construct in the model

Construct	Dimension	Indicator	*r*(P)*	*α*	Inference
(1)	(2)	(3)	(4)	(5)	(6)
Automatic Patch Work Behavior (APWB) modification of (Janssen, 2000; Kim & Kim, 2019)	Implementing knowledge and skills updates	Implementing knowledge-based innovation updates	.886	.904	(V); (R)
		Implementing skills-based innovation updates	.733		(V); (R)
	Implementing business process updates	Implementing organizational service simplification updates	.773		(V); (R)
		Implementing organizational accessibility development updates	.847		(V); (R)
	Implementing information technology updates	Implementing relevant technology updates	.840		(V); (R)
		Implementing reliable information updates	.896		(V); (R)
Employees	Change	Sensitive to environmental	.834		(V); (R)

Construct (1)	Dimension (2)	Indicator (3)	*r*(P)* (4)	*α* (5)	Inference (6)
Dynamic	sensitivity	changes			
Capabilities (EDC)	Change	Adapting to environmental	.828		(V); (R)
(Bieńkowska &	adaptation	changes			
Tworek, 2020;	Problem	Intensive on problem solving	.730	.814	(V); (R)
Eisenhardt &	solving and	Finding innovative problem	.613		(V); (R)
Martin, 2000;	innovative	solving ideas			
Pulakos et al.,	Personal	Continuous development and	.790		(V); (R)
2000; D. J. Teece	development	learning			
et al., 1997)					
Employees Agility	Proactive	Predicting problems that are likely	.664		(V); (R)
(EA)		to occur			
(Das et al., 2023;		Taking care of things efficiently	.805		(V); (R)
S. B. Doeze Jager-		and effectively			
van Vliet et al.,	Fleksibility	Adjusting behavior to show	.733		(V); (R)
2019; Tessarini		respect		.820	
Junior & Saltorato,		Changing work methods	.687		(V); (R)
2021)		according to changing demands			
	Resilience	Balancing workload and	.720		(V); (R)
		managing work stress			
		Resilience to changes in work	.723		(V); (R)
		culture			
Organizational	Sensing	Detecting opportunities and threats	.889		(V); (R)
Agility (OA)	Searching	Generating new opportunities	.859		(V); (R)
(Baškarada &	Seizing	Make fair decisions	.881		(V); (R)
Koronios, 2018;	Shifting	Proactive in implementing	.952	.935	(V); (R)
Darvishmotevali et		business models			
al., 2020; Salmen	Shaping	Deciding and scaling capabilities	.877		(V); (R)
& Festing, 2022)					

Note: *ρ ≤ .05; *r*(P) = Correlation Pearson; *α* = Cronbach's Alpha; (V) = Valid; (R) = Reliable

All indicators in this study are valid because the values *r*(P) ≥ .334 or *r*(.05;35), Likewise, all constructs are reliable because they conform to the rule of thumb α ≥ .70 (Cho & Kim, 2015; Daud et al., 2018).

The next step after the questionnaire is declared valid and reliable is to distribute it to all respondents to obtain the actual research data in December 2024, in the form of an e-questionnaire using Google Forms.

4. Results

4.1. Full model analysis SEM 1

SEM analysis in this study uses the IBM SPSS Amos application, hierarchical output will produce a comprehensive data analysis. The confirmatory factor analysis (CFA) value for each indicator in Figure 2, shows that all loading factor (LF) values are ≥ .70, according to the rule of thumb (Hair et al., 2010).

The goodness of fit (GOF) values, namely: Chi-square 403.295 ≥ 238.322 (should be ≤) obtained from the Excel application =CHIINV(.05;204), Probability=.000 (should be ≥ .05), AGFI=.818 (should be ≥ .90), and RMR=.062 (should be ≤ .05) are poor fit; while GFI=.853 (should be ≥ .90) is marginal fit; Furthermore, CMIN/DF=1.977 (≤ 2.00), RMSEA=.067 (≤ .08), TLI=.951 (≥ .95), CFI=.957 (≥ .95), and NFI=.917 (≥ .90) are fit.

In Table 3, there are still outliers data, namely observations that have values in columns p1 and p2 ≤ .001 (Collier, 2020) or equivalent to Mahalanobis d-squared ≥ 48.268 obtained from the Excel application =CHIINV(.001;22) thus there are six outlier observations (disrupts the normality of the data and causes the GOF values to still contain poor fit), namely: observations 144, 23, 20, 14, 83, and 169 which will be removed so that the SEM analysis can be continued.

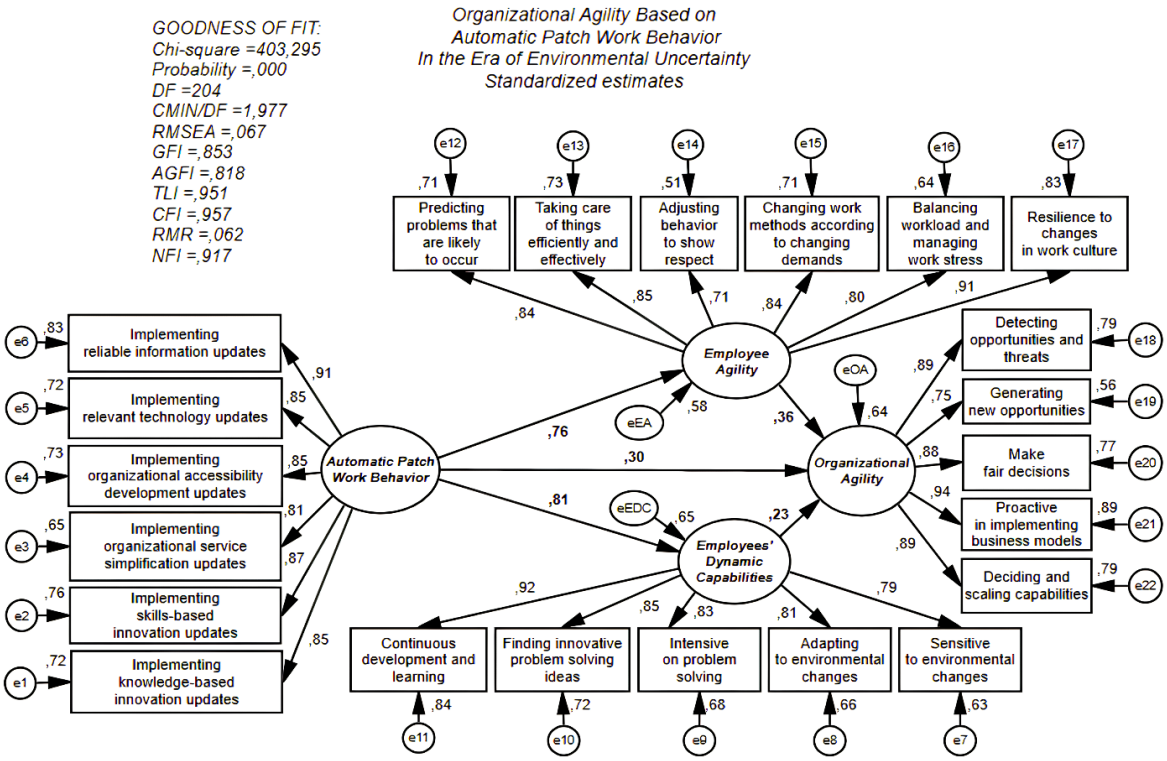

Fig. 2. Full model analysis SEM 1

Table 3. Full model analysis SEM 1 (Multivariate outliers)

Observation number	Mahalanobis d-squared	p1	p2
(1)	(2)	(3)	(4)
144	142.806	.000	.000
23	111.302	.000	.000
20	78.894	.000	.000
14	78.517	.000	.000
83	69.278	.000	.000
169	58.880	.000	.000

4.2. Full model analysis SEM 2

The goodness of fit values in Figure 3, namely: AGFI=.894 (should be ≥ .90) is a marginal fit; Chi-square 229.771 ≤ 238.322 obtained from the Excel application =CHIINV(.05;204), Probability=.104 (≥ .05), CMIN/DF=1.126 (≤ 2.00), RMSEA=.024 (≤ .08), GFI=.914 (≥ .90), TLI=.991 (≥ .95), CFI=.992 (≥ .95), RMR=.043 (≤ .05), and NFI=.934 (≥ .90) are fit.

Although the CFA value of each LF indicator is ≥ .70, in the employee agility construct, the adjusting behavior to show respect indicator does not meet the practical rule of thumb, namely .58 ≤ .70 (Hair et al., 2010), or the adjusting behavior to show respect indicator in the contemporary era has the opportunity to start to be less intense or less noticed in employee work practices, this is in accordance with the justification of previous research that there is a trend of increasing workplace incivility and decreasing norms of politeness and respect in work interactions (Schilpzand et al., 2016), as well as that incivility is increasingly appearing in Asian organizations, and has a negative impact on work engagement (Guo et al., 2022), so that this indicator will be removed from the model.

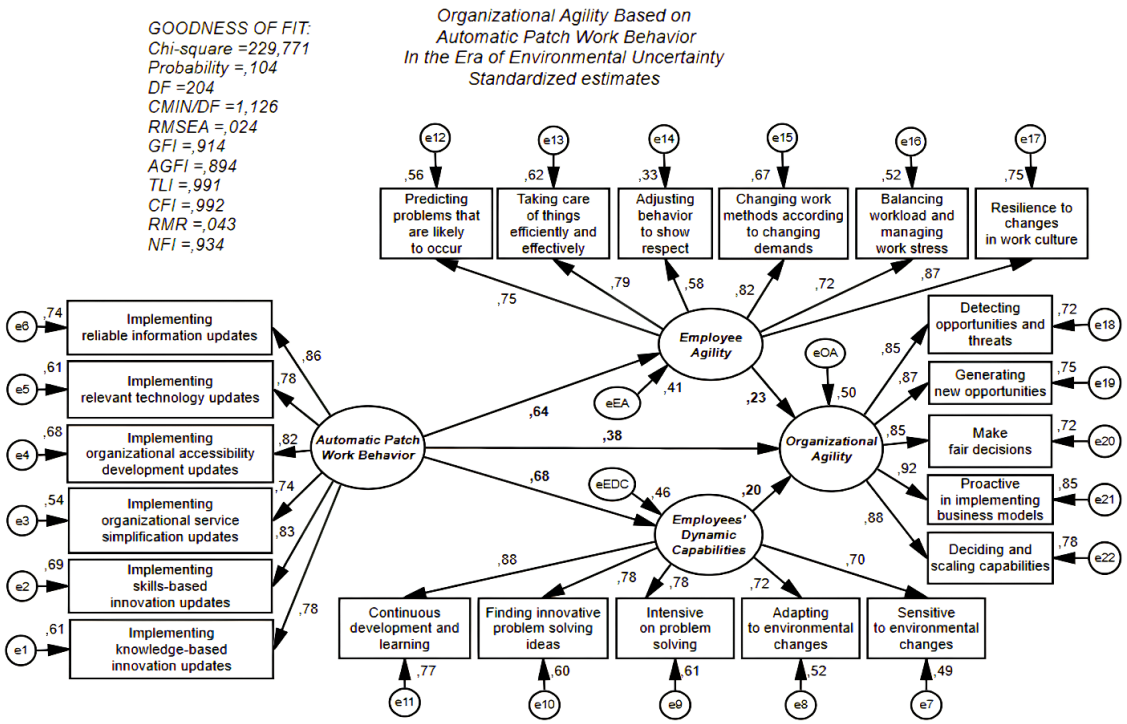

Fig. 3. Full model analysis SEM 2

4.3. Full model analysis SEM 3

After removing six outlier observations in SEM model 1 and one indicator due to LF not meeting the rules of thumb in SEM model 2, the next step was to conduct a multivariate normality analysis. Based on Table 4, it can be observed that the values of c.r. skew and c.r. kurtosis for all indicators are in the range of ± 2.576, but the multivariate value of 7.405 ≥ 2.576, thus indicating that the data is not normally distributed.

Table 4. Data normality evaluation (Full model analysis SEM 3)

Variable	Min	Max	Skew	c.r.	Kurtosis	c.r.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
OA5	6.000	10.000	.216	1.287	-.465	-1.386
OA4	6.000	10.000	-.015	-.090	-.456	-1.359
OA3	6.000	10.000	.072	.431	-.490	-1.460
OA2	6.000	10.000	.058	.348	-.514	-1.531
OA1	6.000	10.000	.186	1.106	-.456	-1.358
EA6	6.000	10.000	-.034	-.201	-.199	-.592
EA5	6.000	10.000	.172	1.027	-.430	-1.282
EA4	6.000	10.000	-.079	-.472	-.440	-1.310
EA2	6.000	10.000	-.164	-.974	-.503	-1.500
EA1	6.000	10.000	-.145	-.864	-.452	-1.348
EDC5	5.000	10.000	-.083	-.492	.066	.197
EDC4	6.000	10.000	.187	1.113	-.777	-2.316
EDC3	6.000	10.000	.043	.255	-.538	-1.603
EDC2	6.000	10.000	.081	.485	-.163	-.486
EDC1	6.000	10.000	-.243	-1.448	-.459	-1.368
APWB6	6.000	10.000	.174	1.035	-.657	-1.957
APWB5	6.000	10.000	.045	.267	-.558	-1.662

Variable	Min	Max	Skew	c.r.	Kurtosis	c.r.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
APWB4	6.000	10.000	.263	1.567	-.600	-1.788
APWB3	6.000	10.000	.268	1.596	-.460	-1.370
APWB2	6.000	10.000	.138	.823	-.512	-1.525
APWB1	6.000	10.000	.071	.425	-.459	-1.366
Multivariate					31.541	7.405

The Bollen-Stine bootstrap test option was used to address non-normality, using bootstrap maximum likelihood estimation to examine structural relationships and identify whether they are within the 95% confidence interval and to determine how well the model fits the bootstrap sample (Collier, 2020; Hoyle, 2014; Kline, 2005). The Bollen-Stine bootstrap test, as shown in the AMOS output screenshot, yields a value of .482 > .05, so the data is assumed to be multivariate normally distributed.

Bollen-Stine Bootstrap (Default model)

The model fit better in 519 bootstrap samples.
It fit about equally well in 0 bootstrap samples.
It fit worse or failed to fit in 481 bootstrap samples.
Testing the null hypothesis that the model is correct, Bollen-Stine bootstrap p = ,482

The next step after conducting a multivariate normality analysis is to examine the CFA values in Figure 4, where the CFA of all indicators already has a LF value ≥ .70 according to the rule of thumb (Hair et al., 2010), thus, each observed indicator is valid in reflecting its construct.

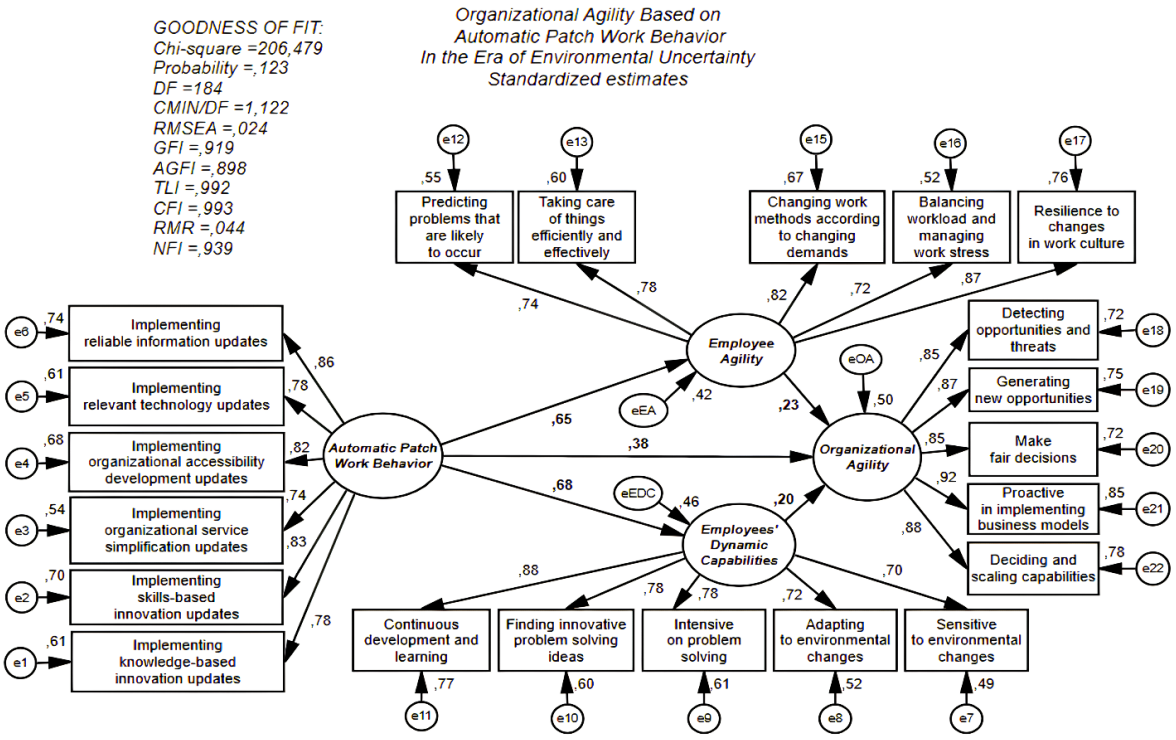

Fig. 4. Full model analysis SEM 3

Table 5. Construct Reliability and Varian Extract

Reliability Measures	APWB	EDC	EA	OA
(1)	(2)	(3)	(4)	(5)
Construc Reliability (CR)	.915	.888	.891	.934
Variance Extract (VE)	.644	.614	.622	.739

$$Note:\ CR = \frac{(\sum Loading\ Factor)^2}{(\sum Loading\ Factor)^2 + \sum \varepsilon_j};\ VE = \frac{\sum Loading\ Factor^2}{\sum Loading\ Factor^2 + \sum \varepsilon_j}$$

Table 5 shows that the construct reliability (CR) of APWB=.915, EDC=.888, EA=.891, and OA=.934 are all ≥ .70, thus all indicators consistently (reliably) measure their constructs. Furthermore, the variance extract (VE) of APWB=.644, EDC=.614, EA=.622, and OA=.739 are all ≥ .50, thus the variation of each indicator is able to reflect its construct. The results of CR ≥ .70 and VE ≥ .50 indicate that the constructs used in the model are reliable.

Next, calculate discriminant validity as a form of construct validity used to ensure that a construct in a research model is truly different from other constructs that have conceptual similarities. A construct is said to have good discriminant validity if the square root of VE value is greater than the correlation between other constructs in the model. This criterion indicates that the indicators in a construct are more capable of explaining the variance of the construct itself than explaining the variance of other constructs. The discriminant validity (DV) value can be obtained using the Excel application =SQRT(VE), referring to Table 5, the discriminant validity (DV) of APWB=.802, EDC=.784, EA=.789, and OA=.860 are all ≥ standardized path coefficient (β) of APWB → OA=.380, APWB → EDC=.680, EDC → OA=.204, APWB → EA=.647, and EA → OA=.230 (in Table 6), thus fulfilling the discriminant validity, confirming that each construct in the model has a unique identity (unidimensionality) and there is no conceptual overlap with other constructs (redundant), thus increasing the clarity and accuracy of the interpretation of the research results (Fakhri et al., 2025; Fornell & Larcker, 1981).

Goodness of fit in Figure 4, namely: AGFI=.898 is a marginal fit (should be ≥ .90); Chi-Square 206.479 ≤ 216.649 obtained from the Excel application =CHIINV(0.05;184), Probability=.123 (≥ .05), CMIN/DF=1.122 (≤ 2.00), RMSEA=.024 (≤ .08), GFI=.919 (≥ .90), TLI=.992 (≥ .95), CFI=.993 (≥ .95), RMR=.044 (≤ .05), and NFI=.939 (≥ .90) is a fit. The GOF values are getting closer to the good fit category, so that it has an impact and is meaningful that the population covariance matrix estimated from the sample covariance matrix is not different, in other words the resulting model is in accordance with the sample data.

Furthermore, hypothesis testing can be carried out after the full feasibility test of SEM 3 model is declared to be in accordance with the required justification (there are no outlier data, it meets the assumption of data normality, CFA meets the requirements, and the SEM model meets the goodness of fit).

Table 6. Hypothesis testing

Path	*B*	*β*	SE	CR	*ρ*	Inference
(1)	(2)	(3)	(4)	(5)	(6)	(7)
APWB → OA	,506	,380	,123	4,124	***	Support (H1)
APWB → EDC	,644	,680	,080	8,003	***	Support (H2)
EDC → OA	,287	,204	,123	2,332	,020	Support (H3)
APWB → EA	,690	,647	,086	7,987	***	Support (H5)
EA → OA	,287	,230	,103	2,783	,005	Support (H6)
Estimation of indirect effect			Sobel test	Value	*ρ*	
APWB → EDC → OA (.680 X .204)		.139	2.241		.025	Support (H4)
APWB → EA → OA (.647 X .230)		.149	2.632		.008	Support (H7)

Note: B = Unstandardized path coefficient; *β* = Standardized path coefficient; SE = Standard Error; CR = Critical Ratio; ρ ≤ .05 (two tailed)

Through a combination of Amos output (Table 6) and Sobel test using the application on https://www.danielsoper.com/ (Figure 5), the relationship between automatic patch work behavior and organizational agility has a standardized patch coefficient value of .380, the t-table is obtained using a sample size of 219 - 6 = 213 with 4 constructs (df = 2013 - 4 = 209) so that the value obtained from the Excel application =TINV(.05;209) = 1.971 thus, the critical ratio value of 4.124 ≥ 1.971 or ρ ≤ .05 = .000 ≤ .05, indicating support for H1 (automatic patch work behavior will be positively related to organizational agility), that the better the automatic patch work behavior, the more it will improve organizational agility, This means that the better the employee's work behavior related to the implementation of knowledge and skills updates, business processes, and information technology, the more it will increase organizational agility which is reflected by sensing, searching, seizing, shifting, and shaping.

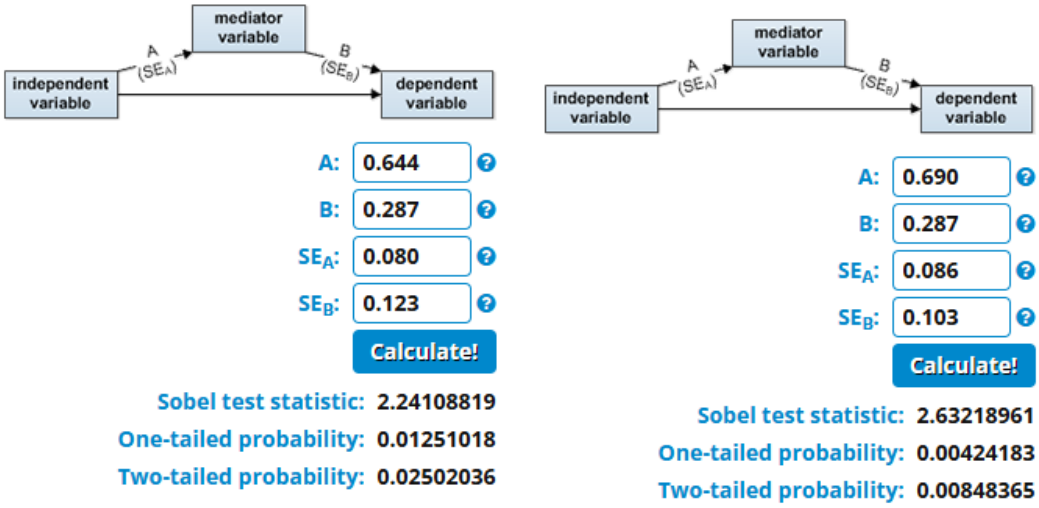

Fig. 5. Sobel Test Statistic (APWB → EDC → OA and APWB → EA → OA)

Likewise, automatic patch work behavior towards employees' dynamic capabilities with a standardized patch coefficient value of .680, a critical ratio value of 8.003 ≥ 1.971 or ρ ≤ .05 = .000 ≤ .05, this indicates support for H2 that the better the automatic patch work behavior, the better the employees' dynamic capabilities, meaning that the better the employee's work behavior in implementing knowledge and skills updates, business processes, and information technology, the more it will increase change sensitivity, change adaptation, problem solving and innovativeness, and personal development as characteristics of employees' dynamic capabilities. Next, the relationship between employees' dynamic capabilities and organizational agility with a standardized patch coefficient of .204, a critical ratio value of 2.332 ≥ 1.971 or ρ ≤ .05 = .020 ≤ .05, indicates support for H3 that the better employees' dynamic capabilities, the more organizational agility will be increased or the better employee capabilities related to change sensitivity, change adaptation, problem solving and innovativeness, and personal development will further encourage increased sensing, searching, seizing, shifting, and shaping in reflecting organizational agility. Empirically, employees' dynamic capabilities as a mediator can be explained by the estimation of indirect effect value of .139, the Sobel test statistic value = 2.241 ≥ 1.96 or ρ ≤ .05 = .025 ≤ .05, indicating support for H4 that employees' dynamic capabilities as a mediator of automatic patch work behavior towards organizational agility, thus the increasing of employees' dynamic capabilities will further increase the mediating role of automatic patch work behavior which in turn will further increase organizational agility.

The next analysis of the relationship between automatic patch work behavior and employee agility with a standardized patch coefficient value of .647, a critical ratio value of 7.987 ≥ 1.971 or ρ ≤ .05 = .000 ≤ .05, this indicates support for H5 that the better the automatic patch work behavior, the better the employee agility, meaning that the better the employee work behavior related to the implementation of knowledge and skills updates, business processes, and information technology, the more it will increase proactiveness, flexibility, and resilience in reflecting employee agility. Then the relationship between employee agility and organizational agility with a standardized patch coefficient of .230, a critical ratio value of 2.783 ≥ 1.971 or ρ ≤ .05 = .005 ≤ .05, indicates support for H6 that the better employee agility, the more organizational agility will increase. This means that better employee proactiveness, flexibility, and resilience will encourage increased sensing, searching, seizing, shifting, and shaping as characteristics of organizational agility. With the significance of both relationships, the construct of employee agility as a mediator can be explained by the estimation of indirect effect value of .149, the Sobel test statistic value = 2.632 ≥ 1.96 or ρ ≤ .05 = .008 ≤ .05, indicating support for H7 that employee agility mediates automatic patch work behavior towards organizational agility, this shows that the increasing employee agility will further increase the mediating role of automatic patch work behavior which in turn will further increase organizational agility.

5. Discussion

The implementation of knowledge- and skill-based innovation updates as characteristics of automatic patch work behavior will encourage increased organizational agility, thus justifying previous research that the behavior of

combining external knowledge and business process digitalization skills supports innovation performance in improving organizational agility (Sharif et al., 2024). Service simplification and the development of optimal organizational accessibility as part of the business process, which are characteristics of automatic patch work behavior, are positively related to organizational agility, in accordance with the findings of previous studies that behaviors that focus on clarity and simplicity such as organizational stability, effective team work, and continuous organizational course correction have a direct impact on organizational agility (Pulakos et al., 2019), similarly that behaviors that anticipate changes in the business environment will provide opportunities for organizational agility in utilizing its restructuring and reorganization (Omidvar et al., 2021). The use of relevant technology and reliable information as one of the activities of automatic patch work behavior has the potential to further increase organizational agility. Strategic insight, employee internal and external response orientation, human resource capabilities, and employee information technology capabilities are factors in measuring organizational strategic agility (Arokodare et al., 2020). The drive of automatic patch work behavior towards increasing organizational agility is reflected through the ability to sense, search, seize, shift, and shape related to business models, strategies, and capability transformation in an era of environmental uncertainty.

Furthermore, the better implementation of knowledge- and skill-based innovation updates as part of automatic patch work behavior will be positively related to employees' dynamic capabilities confirmed through continuous development and learning capabilities, this is in accordance with empirical studies that the implementation of innovative work behavior (good integration of learning and resources) will be a fundamental source of competitive advantage from dynamic capabilities (Al Wali et al., 2020). Simplifying services and developing organizational accessibility as part of the business process will automatically increase employees' dynamic capabilities which are reflected by the ability to adapt and be sensitive to environmental changes, thus the dynamic aspect of dynamic capabilities allows behavioral iterations to modify resources, practices, and organizational capabilities (Chadwick & Flinchbaugh, 2021). The use of relevant technology and reliable information has a great potential to increase employees' dynamic capabilities, which are reflected in the ability to find and solve problems, thus justifying previous research that employees' competitive behavior and attitudes support employees' dynamic capabilities in improving employees' digital performance (Wang, Mansor, et al., 2024).

The better the capability to adapt and be sensitive to environmental changes as one of the characteristics of employees' dynamic capabilities, the more it will increase organizational agilty which is reflected as sensing, namely detecting new opportunities and threats in the external environment, this can be interpreted that organizations must have a comparative advantage in an uncertain environment and how their dynamic organizational nature can develop intrinsically in supporting organizational agility (Apascaritei & Elvira, 2021). The capability to find and solve problems as part of employees' dynamic capabilities is positively related to organizational agilty which is confirmed as shaping, namely deciding and scaling new capabilities that affect the external environment and seizing, which is fair decision making related to business models, strategies, and transformations, this justifies previous research that capabilities are positively related to the ability to face conditions of continuous uncertainty on an unprecedented scale so that they have different strategies, processes, and capabilities within the organization (Zahoor et al., 2022), Likewise, changes in organizational structure lead to dynamic capabilities that are able to understand the latest information technology and organize organizational resources to meet dynamic market conditions, thereby increasing organizational agility (Cannas, 2023). Optimal continuous development and learning capabilities will support increased organizational agility, which is reflected in searching, which generates new opportunities within the organization, and shifting, which is proactive in implementing new business models, strategies, and capabilities. Thus, it becomes an urgent need for an organization related to dynamic capabilities to achieve strategic goals through the use of new technologies and using its expertise to compete in the market (D. Teece et al., 2016).

Implementation of knowledge and skill-based innovation updates as characteristics of automatic patch work behavior is positively related to employee agilty which is reflected by proactive actions such as predicting problems and taking care of various things efficiently and effectively, thus employee work behavior such as collaboration, cooperation, and knowledge sharing are factors related to employee agilty (Asari et al., 2014), likewise employee behavior such as high willingness to work, learn, and critical attitude leads to employee talent agility (Harsch & Festing, 2020), Simplification of services and development of optimal organizational accessibility are part of the business process to increase employee agilty which is confirmed by resilience traits such as aligning workloads and being resilient to change, therefore through resilience, coping with change, teamwork, assertiveness, desire to learn, independence, and courage are factors that can increase employee agility over time (S. B. Doeze Jager-van Vliet et al., 2019), attitudinal and behavioral factors such as the need for change, the need for strength, and the need for goal achievement are positively related to employee agility (S. Doeze Jager-van Vliet, 2017). The use of relevant technology and reliable

information as part of automatic patch work behavior is positively related to employee agility, which is represented by flexible actions such as changing work methods according to changing demands. This justifies previous research, that multidimensional constructs that include behaviors of accepting change, decision making, creating transparency, collaboration, customer orientation, iteration, testing, and learning are the core of employee agility (Petermann & Zacher, 2021). There is one indicator that does not reflect the construct, namely adjusting behavior to show respect, where in environmental uncertainty it is likely to be less intense or less noticed in employee work practices, this is in accordance with the results of previous studies that respectful behavior in the workplace does tend to decrease or shift to issues of incivility and lack of respect, both in the global and Asian contexts (Guo et al., 2022; Schilpzand et al., 2016), so that the scoring based on respondents' perceptions for this indicator has the potential to be extreme (outlier), therefore it is not included to describe the phenomenon of the hypothesized construct in the research model, however, the flexible dimension through the indicator of changing the way of working according to the demands of change still reflects the employee agility construct, so it becomes a representation to be included in analyzing phenomena related to the employee agility construct.

Resilience traits such as aligning workloads and being resilient to change, which are characteristics of employee agility, are positively related to organizational agility, which is reflected by searching activities, which generate new opportunities in the organization. This justifies previous research that the main component of organizational agility is employee agility and is the ability to quickly adapt from employees of an organization to changes in technology, consumer demand, and government regulatory norms (Glinska et al., 2012). Proactive actions such as predicting problems and managing things efficiently and effectively as part of employee agility encourage increased organizational agility, which is confirmed by shifting activities, which are proactive in implementing new business models, strategies, and capabilities, and sensing, which is detecting new opportunities and threats in the external environment. This means that agile employees are very important in creating organizational agility, namely employee agility depends on the process of how employees handle and respond to changes in unpredictable environmental conditions (Ragin-Skorecka, 2016). Furthermore, flexible actions such as changing the way of working according to the demands of change which are the characteristics of employee agility are positively related to organizational agility which is represented by shaping activities, namely deciding and scaling new capabilities that affect the external environment and seizing, which is fair decision making related to business models, strategies, and transformations, this is a justification in previous empirical studies that for employee job sensitivity, it is recommended that employees plan in such a way regarding the skills needed at all levels, especially the operational level of work, so as to be able to obtain the agility of the employees themselves which then results in organizational agility (Goodarzi et al., 2018), conditions of increasing environmental uncertainty in the business world that cause organizations to need agility through the contribution of employee agility, where it is a valuable resource for achieving team and organizational level outputs, such as team agility and organizational agility (Salmen & Festing, 2022).

6. Conclusion

Literature analysis has been conducted equipped with empirical evidence in filling the research gap aligned with the aim of conceptualizing, confirming, and proposing a synthetic construct, namely automatic patch work behavior with three dimensions and its indicators: identifying knowledge and skill updates (knowledge-based innovation and skill-based innovation), identifying business process updates (simplification of organizational services and development of organizational accessibility), and identifying information technology updates (relevant technology and reliable information), along with its measurement scale. The theoretical validation carried out refers to a literature review in which all constructs used have dimensions and indicators related to the idea of environmental uncertainty elements and a pilot study was conducted on respondents who have the capability to confirm the accuracy of the scale, while empirical validation is proven through confirmatory factor analysis that the indicators used are able to reflect their respective constructs. Furthermore, to validate automatic patch work behavior as a representation of the construct (concept) that is the focus of attention, its observable manifestations, and the process of construct development accompanied by empirical verification with other constructs (nomological validation), the hypothetical relationship between automatic patch work behavior and organizational agility is combined with two ideas positioned as mediators, namely employees' dynamic capabilities and employee agility. Thus, the steps of conceptualizing and confirming and proposing the construct of automatic patch work behavior can be carried out simultaneously, which then identifies the mechanism of its relationship with organizational agility in the context of environmental uncertainty.

The proposed synthetic construct, namely automatic patch work behavior, statistically inferentially encourages employees' dynamic capabilities and employee agility in increasing organizational agilty. Likewise, employees'

dynamic capabilities and employee agility mediate automatic patch work behavior towards organizational agilty. Based on this, the study is able to present theoretical contributions in the field of strategic human resource management, positioning automatic patch work behavior as a new entity which means that automatic patch work behavior has the opportunity to connect work behavior to organizational agility in an era of environmental uncertainty. Similarly, practical implications are identified through the relationship between automatic patch work behavior directly and through the mediation of employees' dynamic capabilities and employee agility encouraging increased organizational agility.

This study has limitations in that although it is not always possible to generalize statistics to a larger population (BPS region to BPS Indonesia), however, considering the homogeneity between work units, this study provides an opportunity for analytical generalization to the population. Therefore, in order to obtain a guarantee of comprehensive generalization to the population, a locus such as Statistics Indonesia (Badan Pusat Statistik/BPS) in one region needs to be expanded to its full scope (for example, all regions within a country). Moreover, by testing a synthetic concept combined with other established concepts, the research locus should be applied and expanded to business companies (organizations with characteristics to maximize profits and welfare) rather than only to government agencies (institutions with service and accessibility characteristics), so that the generalizations obtained have theoretical and practical implications in a representative manner, which will then present a research direction that is always updated equipped with various ideas and research models that are not yet covered in the literature.

Conflicts of Interest: The authors declare that they have no conflicts of interest to report regarding the present study.

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