Paper	Publishe	1	Community	Output				Method applical	don:	Input										Method						
											control-flow								data							
General Information:										nsiders process del for further			Rule-based													
(x): characteristic coserved -: characteristic clearly excluded								only for optimization, not for evaluation	decisions during the pa	niders process del for further inclusion uses an eve imperative event log is coss model declarative event log is coss model mentioned	thing: those trined (a) >		Rule-based Data-based routing x + considered (x) + considered but interest for optimization Workflow pattern (iii): XOR		consideres other /		None = only name or role (RRAC) 1-691 = one 1-691 measure (e.g. time for task) complexy multiple 691 82 behavioral measured. Can differ for resources even if they are of same role	individual + each resource is different change over tim Poolid - resources from one-group are equal	des. m /		O - Outland					
mentioned			Research Field						process pr	oss rodel mersoned	Workflow patterns (ii): sequential	Workflow	optimization Workflow	User-based Workflow pattern (iii): Deferred XOR	for optimization		they are of same role				O = Optimal A = Approximate					
Name Author Prescriptive Business Process	Year Confere	ce Journal Conference Name	r	Cycle Phase	Problem category	Optimization objective		only for optimization, not for evaluation	Online / Offline (I)	ocess-model event-log	(ii) sequential	AND (III):	XOR	Deferred XOR	(v)	Resources (v)	Resource Performance Indicators (vl)	Resource Resource time Grouping (viii) profile (viii)		Solution method: (x)	Approximate (xi) Comment	unary/capacity resource profile	task duration	comments		
Monitoring for Recommending Next Best Actions Weinzierl et a	el. 2020 C	Business Process Management Forum	BPM	Enactment	Action recommendation		recommend next best action minimal	x	Online x		x	×	×	x					attributes	Neural network, LSTM			na			
							minimal resources for each department to																			
Resource Optimization in Business Processes Peters et al. Benchmarking Answer Set	2021 C	International Enterprise Distributed Object Computing Conference (EDOC)		Design	Resource planning	minimize number of nesources	f not violate constraints		Offine x	(x)	×	×	×			x	None	pooled -		rho-guided search	0	multiple, unary -				
Business Phocesses Peters et al. Benchmarking Answer Set Programming systems for resources aboustion in business processes Ant-Colony Optimisation for Path Recommendation in Business Process Execution Comuzzi Comuzzi	2022 J	Expert Systems With Applications		Enactment	Resource allocation, Scheduling	arbitrary			Online x		×	×	*			×	1-891	individual + pooled -		Logic Programming (ASP)	o	multiple, unary -	×			
Ant-Colony Optimisation for Path Recommendation in Business Process Execution Comuzzi	2019 J	Journal on Data Semantics		Enactment	Process navigation			x	Offine x		×	×		x						ant-colony optimization ant-colony optimization		implicit availability	na			
Business process optimization using the ant colony system Ng C.Y.	2018 J	Managerial and Decision Economics		Enactment	Resource allocation, Scheduling	arbitrary		×	Offine x		×	×		×	x	x	1-809	Individual -		ant-colony optimization	A	multiple, unary -	×			
Enterprise workflow modeling		5th IEEE International Conference on Cyber Security and Cloud Computing (CSCloud)2015 4th IEEE International Conference on Edde Computing and					find most													dynamic						
Enterprise workflow modeling based on priced timed petri nets. Zheng et al. Business process instalances scharlding with human resources.	2018 C	Scalable Cloud (EdgeCom)		Enactment	Process navigation		suitable path		Offine x		×			x						dynamic programming			na			
based on event priority tamali-Alaoui determination at.	et 2018 C			Enactment	Resource allocation	optimal resource matching		x	Online -	(x)					×	×	complex	individual -	attributes	clustering, genetic algorithm	A	multiple, unany cost, reliability	*			
	2018 C	International Conference on Advanced Information Systems Engineering		Design	Process model selection		and and a		Online -											simulation, linear programming			na			
Turing Concurrency of the Business Process by Dynamic Yaghoubi and Programming Zahedi Business process improvement with the AB-BPM methodology Satyal et al.	2018 C	International Conference on Software and Computer Applications		Enactment	Resource allocation, Scheduling	maximize resource workload balance	instance starting times	×	Offine x	(x)	×	x	×	(1)	×	x	complex	Individual -		simulation, dynamic programming simulation, linear programming		multiple, unary workload	×	resource performance depends on workload		
Business process improvement with the AB-BPM methodology Satyal et al. Constraint Analysis based on Energetic Responding Applied to the Problem of Real Time	2019 J	Information Systems	(previous: BPM		Process model selection				Online -														na			
Energetic Ressoning Applied to the Problem of Real Time Scheduling of Workflow Medianos and	d 2017 C	19th International Conference on Enterpri		Enactment	Process and the same of the sa				08											Simulation, randomized	A	multiple, capacity -				
the Problem of Real Time Scheduling of Workflow Medieins and Management Systems Julia A hybrid and scalable multi-agent approach for patient scheduling based on Petri net models Haleh	2017 C	morration systems		Enactment	Resource allocation,				OTHER X		×			*	-		nome 	AVICUM -		Simulation, randomized algorithm Multi-Agent System - Combinatorial Auction		- uplacey -				
A ryonic and scalador must-agent approach for patient scheduling based on Petit net models Optimization of business processes by automatic	2017 J	Applied Intelligence		unactment	screduling				unine x		×				x		1404	mavidual -			^	muepe, unary -		task execution enhanced		
readocation of resources using the genetic algorithm Djedovic et al Resource management for	. 2016 C	International Conference on Software and Computer Applications		Enactment	Resource allocation	arbitrary		x	Offine x		x	(x)	(x)			x	None	pooled x		simulation, genetic algorithm	A	multiple, unary resources		task execution enhanced the more resources are allocated to it		
Continuation of Insulesses processes by authoritic restriction of resources using the genetic approxime Resources management for Resources management for the presence of availability constatoris Location-seems workflow Location-seems workflow based on result-appet systems based on result-appet systems Read-one management of	2016 J	ACM Transactions on Management Information Systems		Enactment	Resource allocation, Scheduling	miximize number of schedulable instances		x	Offine x		x	x			×	x	complex	individual x		depth-first search, breadth-first search, genetic algorithm Muts-Agent System - Combinatorial	A	multiple, unary availability periods	×			
Location-aware workflow scheduling in supply chains based on multi-agent systems Haleh	2016 C	Conference on Technologies and Applications of Artificial Intelligence		Enactment	Resource allocation, Scheduling	minimize costs			Online -						x	x	1-891	Individual -		Multi-Agent System - Combinatorial Auction	Α	multiple, capacity Locations				
systems. Nacionally, achievements and further challenges Resource affocation with dependencies in business process management systems. Have:		Annual Reviews in Control				performance objective			Online x		×				×	x	None	Individual -		Stochastic aproximation answer set programming logic programming	A	multiple, capacity -				
dependencies in business process management systems Havur Application of Dynamic Instance	2016 C	Business Process Management Forum	BPM	Enactment	Resource allocation, Scheduling				Offine x		×	×		x		×	1.891	individual + pooled -		programming logic programming	0	amount (real number)	×			
Application of Dynamic Instance Queuing to Activity Sequences in Cooperative Business Process Scenarios Rinderle-Ma Process incompanied florauch	2016 J	International Journal of Cooperative Information Systems		Enactment	Batching	minimize instance spanning time			Online -						x					clustering			na			
Scenarios Rinderle-Ma Process improvement through economically driven routing of instances Bolsinger et a		Business Process Management Journal	BPM	Design	Control-flow re-engineering	minimize instance spanning time maximize the value contribution of the process.	Decision point design		Offine x	(x)	×	(x)	×	(x)					attributes	search, evolutionary algorithm	A		na			
							design allocate resources according to social relations																			
O-learning algorithm for task allocation based on social relation Liu et al. On the Fily Performance-Aware	2015 C	Process-Aware Systems		Enactment	Resource allocation	minimize flow time	social relations between resources		Online -	(x)					x	×	1-891	Individual -		q-learning	A	multiple, unary relationship between resource	om x	duration is affected by previous resources		
On-the-Pily Performance-Aware Human Resource Allocation in the Business Process Management Systems Environment Using Nailve Bayes Wibsono et a																										
		Asia-Pacific Conference on Business Process Management	врм	Enactment	Resource allocation	optimal resource matching			Online -						(x)	x	complex	Individual -	- (only	naive bayes	A	multiple, unary properties				
Evaluating the performance of a batch activity in process models Pufahl et al. Planning of business process	2015 C	International Conference on Business Process Management	BPM	Design	Batching				Offine -	(x)					x				- (only additional values)	search algorithm Mixed Integer Linear			na			
Planning of business process execution in Business Process Management environments Base et al. Trust-based workflow reflectoring	2014 J	Information Sciences		Enactment	Resource allocation, Scheduling	arbitrary		x	Offine x		×	×		x	x	x	1-809	Individual -		Mixed Integer Linear Programming, Genetic Algorithm	A	multiple, capacity -	×			
Management environments Bas et al. Trust-based workflow refactoring for concurrent scheduling in service-oriented environment Wang et al. Generating multi-phieritos	2013 J	Concurrency and Computation: Practice and Experience		Design	Control-flow re-engineering	9	parallelize tasks		Offine x		×	(x)	(x)	(x)					Data dependencies	custom O(m*2/m), breadth-first search	0		na			
optimized business process Jimenez-Ram enactment plans et al.	ninez 2013 C	International Conference on Advanced Information Systems Engineering		Enactment	Resource allocation, Scheduling	multi-objective	generate enactment plans		D		(x)	(x)	(x)	(x)	x	×	None	Individual -	ConDec-R	Constraint Programming	0	ConDec-R - multiple, unary				
servec-crement environment variety in a commentary manufach-bettown opinional of ballinas process at al. User recommendations for the opinional examination shall be opinional opinional opinional opinional politicisms processes models from correlater-based specifications.	2013 J	Data and Knowledge Engineering		Enactment	Action recommendation				D	(x)	(x)	(x)		(x)	x	x	None	indvidual -		constraint Programming	0	ConDec-R -				
optimized business process models from constraint-based specifications Barbs et al.	2013 J	International Journal of Cooperative Information Systems		Enactment	Resource allocation, Scheduling	arbitrary			Offine D	(x)	(x)	(x)	(x)	(1)	x	x	None	individual -		constraint Programming	0	multiple, unary ConDec-R availabilities				
improvement into resource		Concurrency and Computation: Practice and Experience				minimize resource	sequantialize																			
On risk management with	2013 J	and Experience		Design	Control-flow re-engineering	g costs minimize expertent	tasks allocate control resources to		Offine x		×	x				×	1-891	pooled -		heuristics (greedy search algorithm)	A	multiple, unany RBAC control cost, control	×			
information flows in business processes Bai et al. A performance analysis on task Xu J., Huang allocation using social context Yu Y., Pan M.	2013 J Z., 2012 C	Information Systems Research Conference on Cloud and Green Computing	OR (Vhb, A+) Neither	Enactment	Resource allocation	loss missimize number o	tasks of throughout		Offine x	(x)	x .		x .		- x		1-RPI complex	pooled -	x	linear programming heuristics		single, capacity effectiveness	- x	control resources		
On the optimization of information workflow	2012 C				Resource allocation, Scheduling				Office						m		1,000	Individual	information flow / input, output of activities	of mixed-integer linear	4	mulitide unerv	Ĺ			
On the optimization of information workflow An Approach to Placement Resources for Business Processes Multi-stribute audion mechanism for supporting resource allocation in business process estact-tribut mechanisms. Pla et al.		International Conference on the Dynamics of Information Systems OTM Confederated International Conferences "On the Move to Meaningful Internet Systems"		Enactment	December of the state of				Outre X	-	Î.	Ĺ			-				Aires	December Natura		- Andrews -	Ė			
Multi-attribute auction mechanism for supporting						resource merching			x	(1)	1		947			-	- Angelon	- Jraces	Ť	Jayanani Networks			Ī			
		Starting Al Researchers' Symposium EEE Transactions on Knowledge and Dat Engineering	ta .	Enactment	Resource allocation Resource allocation	arbitrary minimize resource			Online -				-		X		None	Individual - Individual + pooled -		multi-agent auction linear programming	Α	multiple, arbitrary properties multiple, unary -		Li disensi		
worknow Management Systems Delias et al. Reinforcement learning based resource allocation in business	2011 J			Enactment	resource allocation	conflicts			unine x		×		×		(K)		None			resixation		muepe, unary -		111 allocation		
process management Huang et al. Business process optimization using formalized optimization	2011 J	Data & Knowledge Engineering International Conference on Business Information Systems		Enactment	resource allocation	arbitrary	Parallelize tasks, eliminate activities	*	unine x	(x)	×				×		compliex	indvidual -	x data dependency graph	Q-learning heuristics	^	muspie, unary cost, time, arbitrary	×	resources affect control-flow		
passema Niedermann e A joint optimization algorithm for dispatching tasks in agent-based	et al. 2011 C	Information Systems International Conference on Enterprise Information Systems			Control-flow re-engineering	maximize active			Offine x		×	×	(K)	(1)			None	indvidual -				multiple, unary attributes				
workflow management systems Delias et al. A semi-automatic approach for workflow staff assignment Liu et al.	2008 C 2008 J	Information Systems Computers in Industry	OR (Vhb, C)		Resource allocation	maximize active resources optimal resource matching	assign right resource		Online x	(x)							None -	Individual -		linear programming relaxation decision tree, naive bayes, SVM	A	multiple, unary attributes multiple, unary properties		1:1, allocation		
Workfoor Management Optimers Deline et al. Parketocomershi energie plased process management Parketo optimization samp ternatured optimization soundfrom reassignant systems overform or sample optimization soundfrom reassignant optimization soundfrom reassignant optimization soundfrom reassignant optimization soundfrom sample optimization soundfrom sample optimization sample optim																						multiple, capacity -				
Adaptive workflow scheduling		Simulation Modelling Practice and Theory		Enactment	Process navigation			×	Offine x		×	×		×		×	None	pooled -	data flow edges	simulation, monte is carlo	A	capacity -				
constraints and network Avanaes and dynamics Freytag		Proceedings of the VLDS Endowment		Enactment	Resource allocation, Scheduling	arbitrary			Online x		×	×			х	×	None	Individual -		clustering, constraint programming	A	multiple, unary constraints, locations				
Workfow management systems plus swarm intelligence = Reijers, HA; dynamic task assignment for emergency management MH; Muehlen applications MZ; Appl, W	m,					multiple (response time, troughput	resource allocation for emergency													meta-heuristics						
		Business Process Management	BPM	Enactment	Resource allocation	time)	processes move decision points to the	x	Online -							×	complex	Indvidual -		meta-heuristics (swarm algorithms)	A	multiple, unary	×			
Improving process models by Subramanian discovering decision points at Task Scheduling for a Temporal	n et 2007 J	Information Systems International Workshop on Temporal	- (Vhb, B)		Control-flow re-engineering	minimize g uncertainty	earliest possible point		Offine x	(x)	x	×	x			×	None	pooled -		heuristics, search algorithm	A	unary, capacity -				
Task Scheduling for a Temporal Workflow Management System Effective role resolution in workflow management Zenn and Zhu	tozzi 2006 C	Representation and Reasoning	OR (sVeh A)	Enactment	Resource allocation	arbitrary arbitrary			Online -	-			-		(x)		1.891	individual x		heuristic	Α	multiple, unany RBAC, availability	-			
Effective role resolution in workflow management Zeng and Zhu Ap-time hybrid Petri net model for the acheduling problem of Workflow Management Systems Oliveira		EEE International Conference on System	s,	Frantened	Process naviority	resource conflict minimization			Office	ĺ	į.	Ĺ	m	(*)			None	pooled -	Ĺ	simulation, monte carlo		multiple, amount -	Ĺ			
Workflow Management Systems Cliveira A practical scheduling method based on workflow management technology	2004 C	Man and Cybernetics The International Journal of Advanced Manufacturing Technology		Esset	Process of	arbitrary process		Ĺ	Codes				(K)	(*/	-	Ĺ	1.000	individual + pooled -		simulation, local						
secretory Lin et al.	2004 J	searufacturing Technology		unactment	resource allocation	performance		x	unine x		×	×	×		(K)	x	1404	possed -		search		mape -	*	activity x resource profile		

Paper		Published		Community	Output				Method application	on:	Input	control flow								data	Method							
General Information										core	siders process																	
x: characteristic observed (x): characteristic partly observed -: characteristic clearly excluded femaly!: characteristic not									only for de	options during the proc	siders process let for further inization uses an eve imperative event log is less model is described less model mentioned	ert-log are how mined L(A) >		Cata-based rou x -> considered (x) -> considered	alog 1 md	consideres other /	Resources (v)	None = only name or role (RBAC) 1-691 = one 1-591 measure (e.g. time for task) complexe multiple RP1 &3 behavioral measured. Can differ for resources even if they are of same role	Individual = each resource is different chair Pooled = secuross acts	ounce properties, inge over time / ledule given		O = Optimal A = Accrossimate						
mentioned		Journal /		Research Field SPM/OR/Neth	ld: he Adressed Life-		Optimization	Optimization objective	tor evaluation pr only for optimization, not	process pro-	cess-model	Workflow patterns (iii)	Workflow i): patterns (iii	optimization Workflow pattern (iii):	Workflow pattern (iii):	to optimization Multi instance		they are of same rale Resource Performance Indicators	equal ava	ounce properties rape over time / redule given slability recounce time office (viii) clafa (ix)		A = Approximate Optimal / Solution Me Approximate (xi) Comment	thod	anarity resource molie	esource defines			
Name Workflows management for	Author	Year Conference	FAC Proceedings Volumes (IFAC-		Cycle Phase	Problem category	objective	decision support, accepting new	tor evaluation O	Online / Offline (I)	cess-model event-log	(I) sequential						(10)	Grouping (vii) pro	offic (viii) data (ix)	Solution method: (x) branch-and-bound,			,,	ask duration	comments:		
project-driven manufacturing Re-engineering knock-out processes	Banaszak Z.A. van der Aalst	2003 C 2001 J	PapersOnline) Decision Support Systems	OR -	Enactment Design	Action recommendation Control-flow re-engineerin	ng KPIs	reamange activity order	- 0	Office x		x	x	(x)			x x	1-891	indvidual x				multipli capaci multipli amour	y availabilities s,				
Human resource allocation or recommendation based on multi- factor criteria in on-demand and batch somarios	M. Arian et al.	2016 J	European Journal of Industrial Engineerin	g Neither	Enactment	Resource allocation	optimal resource matching by performance	on-demand and batch resource allocation		Online -				_		×		complex	indvidual x		heuristics on-demand: heuristic (Best Position Algorithm) batch: ILP		uniny	Resource Performance, Resource Cubes			Resource Performance on tesks	
An entropy-based clustering ensemble method to support resource allocation in business	Zhao W., Liu H.,						Resource-task	Allocation at											individual x		entropy based			resource peformence, Resource			Event Log. Resource	
A solution framework based on process mining, optimization, and discrete-event simulation to	Zhao W., Liu H., Dai W., Ma J. Antunes B.B.P., Marresa A., Bastos L.S.L., Marches J.F., Harracher S.	2016 J	Knowledge and Information Systems	Neither	Enactment	Resource allocation	matching	nuntime minimization of	- 0	Online -		Ė		-	-	x	x	complex				0	unary	profiles		Performance & Behaviora	I. N Profiles	
		2019 C	Lecture Notes in Business Information Processing	BPM	Design	Resource planning	find optimal numbe of resources	minimization of patient waiting times	x 0	Office -	×					×	×	None	pooled x		MIP (Mixed Integer Programming)	0	multipl	s, unary -		Performance Time is used	Event Log. Simulation	
An Evidence-Based Decision Support Framework for Clinician Medical Scheduling	Cho M., Song M., Yoo S., Reijers H. A.	2019 J	EEE Access	Neither	Enactment	Resource allocation, Scheduling	find optimal schedule granularity	minimization of patient waiting times does the	x 0	Office -						×	x	1-80%	individual x		simulation of scenarios	0	milliple	unary -		for simulation. Not modell specifically but pulled from event log	ed Event Log, Simulation	
Business Process Simulation with Differentiated Resources: Does & Make a Difference?	López-Pintado O., Dumas M.	2022 C	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial intelligence and Lecture Notes in Bioinformatics)	Neither	Design	Resource planning	better resource representation for allocation	does the differentiation of Resource improve allocation?	. 0	Office x				*				complex	individual + pooled x		simulation, heuristic (best resource)		multol	resouce profiles with		Profile includes: Performance, Availability, Calendar, etc. Profiles are mined	Event Log. EPMN for Simulation	
Clinical pathways analysis of								optimal													Latent Dirichlet allocation (LDA), additive regularization of topic models (ARTM)							
Customing manifest	Prokofyeva E.S., Zeytsev R.D.	2020 j	Business Informatics	Neither	Design	Resource planning	optimal clusters	optimal clustering of patient routes (processes)	- 0	Office -	*					×	x	None	pooled -			Α	capaci	y -		Trace Clustering	Event Log.	
Clustering and operation analysis for assembly blocks using process mining in shipbuilding industry. Combing metaheuristics and process mining: Improving cobol placement in a combined cobot assignment and job shop scheduling problem.	Lee D., Park J., Pulshashi I.R., Bae H.	2017 C	Lecture Notes in Business Information Processing	врм	Design	Control-flow re-engineerin	best planning dusters	find best planning clusters	- 0	Office x	×	x				x	x	None	pooled -		Hierarchical agglomerative clustering	A	capaci	workshops (plan clusters) are resources		Trace Clustering	Tasks and Workshops are clustered and later compared	
process mining: Improving cobot pleament in a combined cobot assignment and job shop acheduling problem	Kinast A., Doemer K.F., Rinderle-Ma S. Senderovich A., Wedishion L., Gall A., Mandelbaum A., Kadah S., Bunnell C.A.	2022 J	Procedia Computer Science	BPM	Design	Resource planning	cobot placement	find best places for cobots	x 0	Office -	*					×	×	complex	Individual -		Genetic Algorithm with biased random key encoding	A	capaci	,		costs of cobot, vs current workstation is compared	Outcome of GA is an Event Log which is then mined with PM	
Conformance checking and performance improvement in	Senderovich A., Weidlich M., Yedidalon L., Gall A., Mandelbaum							improve process performance																		time, per resource type. Names Resource-driven processes	Event Log and schedule, conformance check of whethis	
scheduled processes: A queueling-network perspective	A., Kedish S., Bunnell C.A.	2016 J	Information Systems	врм	Enactment	Resource allocation, Scheduling	improve process performance	through better scheduling identify the	- 0	Online -	×					×	×	complex	pooled -		queuing network	A	multipl	s, unary scheduled		Names Resource-driven processes	check of schedule	
Discovery of path-attribute dependency in manufacturing environments: A process mining	Choueld A.C., Portela Santos E. A.						impact of path decisions on downstream parameters	identify the impact of upstream path decisions on downstream parameters											indvidual -	path dependen	yon					Influence of resources on Path of Process		
		2019 J	South of manufacturing Systems	Name of the last	Leage	resource passing	Resource-resource	find best substitute in case of				1	-					1-891	-		Degree of substitution			performance and interaction in		find fitting substitutes for	event log ->	
Dynamic human resource selection for business process exceptions Enabling the Use of Shop Floor Information for Multi-criteria Decision Making in Maintenance Prediction	Kim J., Choi I. Kurscheidt Netto R.J., de F. R.	2019 J 2021 C	Knowledge and Process Management Socionar Processions in Mathematics and	Neither	Enactment	Resource allocation	matching onlimal arbadule	uncertainty schedule optimal time windows for	- 0	Online -							x	1-891	individual x	measurem data from	substitution ent on sence Multicriteria Decision		multipl	s, unary network (handover matrix)		information on machine status is gathered and use	social network	
			Statistics	Neither	Enactment	Action recommendation	for maintenance	maintenance find best estimated	- 0	Online -	×					x	x	compliex	Individual -	decision degredatio	Model		single,	unary resources process (machine)		for predictive maintenance	causal net	
Establishment of maintenance inspection intervals: an application of process mining techniques in manufacturing	Ruschel E., Santos E.A.P., Loures E.F.R.	2020 J	Journal of Intelligent Manufacturing	Neither	Enactment	Action recommendation	optimal schedule for maintenance	interval between maintenance inspections	- 0	Online -	×					×	×	1-80%	Individual -	rate + prod Data from for mainte inspection	n ess pm sance Bayesian Networks, Simulation		single	single resource and this unany resources process (machine)		information on machine status is gathered and use for predictive maintenance	Event Log ad mined for one Machine	
Experimental Verification on																										behavioral measures in human centric network	Bipartite Graph, Process-Aware Affiliation Network (PAN),	
Experimental Verification on Human-Centric Network-Based Resource Allocation Approaches for Process-Aware Information Systems	Yean MS., Lee YK., Pham D L., Kim K.P.	2022 J	EEE Access	Neither	Enactment	Resource allocation	social resource allocation	support future human resource allocation	. 0	Online -						×	x	complex	individual -		Graph theory		multipl	s, unary resources as parts of network		behavioral measures in human centric network	Process Aware Enterprise Social Network (PESN)	
		2019 C	Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in			Descure allocation	minimize risk of ba allocation by definition of	define best d allocation points to optimize process performance										1 000	pooled -	Fragments	tion tota Logic Programming					n:1 repra.; resource performance has not effect on allocation timestamps are used to predict activity time	organizational model, event log >> petri net	
		2019 C	Bioinformatics)	BPM	Enactment	Scheduling	allocation points	penormance	- 0	Online x		×	×	x	x		x	1-809		Objects	(Aur)	0	multipl	s, unary part of organizational model :		predict activity time How many resource for a task improve process? The more resources the oxicker is a task handled	log -> petri net stochsatic process model (hauristic miner)	
on improving the association of Human Resources	Djedovic et al.	2018 J	Mathematical Problems in Engineering	Neither	Enactment	Resource allocation	cost		x 0	Online x	×	x	×	x			*	None	pooled -		Algorithm	A Evolutioner Algorithm	multipl	s, unary resources .		quicker is a task handled	(heuristic miner)	
Learning scheduling models from event data	Senderovich A., Booth K.E.C., Beck J.C.	2019 C	Proceedings International Conference on Automated Planning and Scheduling, ICAPS	Neither	Enactment	Resource allocation, Scheduling	optimal scheduling	learn a cp model for the basic scheduling problem	. 0	Online x		×	x			×		1-891	indvidual -	only time perspectiv	Constraint Programming (Cplex)	o cruex	multipli and ca	s, unary pacity multiple description		Resources described in Activity Resource Petri ne	Event Log → ts timed patri net	
	ин иис							minimize resource usage white ensuring process reliability (deadlock freedom)													SET and LRC	sirrole (Bar	and con					
Mining emergency event logs to support resource allocation	LI H., LIU C., ZENG Q., HE H., REN C., WANG L., CHENG F.	2021 J	EICE Transactions on Information and Systems	Neither	Design	Resource planning	minimum resource usage	reliability (deadlock freedom)	- 0	Office x	x	×	×	x			x	None	pooled -	only time perspectiv	SET and LRC strategies, newly designed algorithms based on Event Log and mined process	performanc measures). A auch limitat	e evt. multpl ion? capaci	s, y reusable and consumable			Event Log -> pair in et, Real evengency data posticitive model = process activity duration = bayeaian nelsook prob. model = causal net obtained di through process missing	
																											model = process activity duration =	
Mining Shop-Floor Data for Preventive Maintenance Management: Integrating Probabilistic and Predictive	Ruschel E., Santos E.A.P., Loures E.D.F.R.						mayini	schedule maintenance		Ordina v								complex	Individual -		3 predictive models, machine working, machine feeding and short stoppage					information on machine status is gathered and use for predictive maintenance	network prob. model = causal net obtained	
and the same of th		2017 J	Procedia Manufacturing	Neither	Enactment	Action recommendation	availability	availability loss Mine product tree from event	- 0	Online x	×	×	×	(×)				complex	Individual -				availat	dity		for predictive maintenance		
Multi-product scheduling through process mining: bridging optimization and machine process intelligence	Portela Santos E. A.	2021 J	Journal of Intelligent Manufacturing	Neiter	Enactment	Resource allocation, Scheduling	from multi-product view	machines to tasks min cost max	. 0	Office x	×	×	x			×	×	complex	Individual -		product tree generation from petri net, Genetic algorithm search	A GA	multipl	s, shared machines and processing times			Combination of Scheduling and bill of materials, Event Log	
Prediction-based resource allocation using LSTM and minimum cost and maximum flow allocation								flow network problem, improvement of online													bipartite graph, network simplex alcorithm					problem is called "non- clain opart online-over- time" problem	event log, execution times and next events are predicted and used in schedule	
-9	Park G., Song M.	2019 C	Proceedings - 2019 International Conference on Process Mining, ICPM 20 Lecture Notes in Computer Science (Including subseries Lecture Materials)	19 BPM	Enactment	Resource allocation	optimal online scheduling	scheduling/alloc ation	- 0	Online -	x					x	x	1-RP1	Individual -			A & O network sin	rplex multipl	s, unary part of schedule		clairvoyant online-over- time" problem	and used in schedule	
allocation based on process mining	Zhao W., Yang L., Liu H., Wu R.	2015 C	Artificial Intelligence and Lecture Notes in Bioinformatics)	Neither	Enactment	Resource allocation	optimal processing time	social resource allocation	- 0	Online -	×						x	complex	Individual -		dynamic programming	O simple	multipl	s, unary performance			information on collaboration event log, event	
Workflow simulation for operational decision support using event graph through process mining	LLV Power							create a plan which leads to best process performance under uncertainty										complex	indvidual -		event graph mining,						event log, information on collaboration event log, event graph, resource performance, nesource collaboration, fearmanck performance	
process mining Automatic Generation of Optimization Model using	Liu Y., Zhang H., Li C., Jiao R.J.	2012 J	Decision Support Systems	Neither	Design	Resource planning	plan PERCUTOR	uncertainty minimize a robots	x 0	Office x	×	×	×	x		×	x	complex	individual -		simulation	Α -	multipl	s, unany performance				
procisis mining Automatic Cemeration of Optimization Model using Process Mining and Petri Nets for Optimal Motion Planning of 6- DOF Manipulators	Dando T., Nahi T., Alam M.M., Liu Z., Fujiwara T. Cho M., Song M.,	2022 C	EEE International Conference on Intellige Robots and Systems	ent Neither	Enactment	Process navigation	minimization of robot movement	joint angles postures	0	Online x	×	×	×		×						Graph-search	A Not Describ	ed -				petri net from robot firing sequences	
A new framework for defining realistic St. Ax: An evidence- based approach	Cho M., Song M., Miller C., Fernandez P., del-Rio-Orlega A., Resinas M., Rutz-Cortés A.	2017 J	Lecture Notes in Business Information Processing	Neither	Design	SLA planning	optimal SLAs	measure SLO performance to define better SLAs	0	Offine -	×						x	complex	pooled -	only time perspective	Genetic Programming					complex profile for a role	event log, only performance measures	
Integrated framework of process mining and simulation— optimization for pod structured clinical layout design	Halawa F., Chalil Madathi S.,						minimization of	Room planning, Unequal Area Facility Layout Problem													Particle Swarm (GA), Probabilistic Deterministic Finite Automata for PM	Comparison	n of			rooms in clinic, pathway	hospital patient	
clinical layout design	Khasawneh M.T.	2021 J	Expert Systems with Applications	Neither	Design	Resource planning	routes in hospital	(UAFLP) Identify bottleneck	0	Office						x	×	None	pooled -		Automata for PM	A Searches -	GA Best capaci	y rooms -		reduction	flow event log	
A digital twin based framework for detection, diagnosis, and improvement of throughput holdenocks	Kumbhar M., Ng A H.C. Bandar						Mantifu haddah	nesources, show optimization options and verify by												blockage s							event log to create simulation and recommendatio	
bottlenecks	S. Sandaru	2023 J	Journal of Manufacturing Systems	Neither	Design	Resource planning	resources	simulation	x 0	Office -	×						×	1-809	individual -	starvation	simulation		capaci	y part of event log		utilization of resource	n TYTHINGSIO	

Paper		Published		Community	Output				Method applica	dion:		Input											Method										
													control-flow									data											
General Information: c: characteristic observed x): characteristic partly observe											considers process model for further optimization				Rule-based Data-based routin																		
(x): characteristic partly observe	ed										x - impentive	uses an event-log: x > procedure how event log is mined is described, (x) >			x > considered (x) > considered	•			None = only name or role (RBAC) 1-691 = one 1-691 measure (e.g. time for take) complex= multiple 691 &lj behavioral	Individual * each resource is different	resource properties change over time /	4											
- : characteristic clearly exclude [empty] : characteristic not mentioned	NG .								only for optimization, not	decisions during the nurtime of a process	D → declarative	is described, (x)-> event log is only mentioned			(u) -> considered but inelevant for optimization	User-based	consideres other / multiple-instances for optimization		complexy multiple RPI & behavioral measured. Can differ for resources even if they are of same role.	Pooled = resources from one-group are	schedule given		O = Optio A = Appro	ral									
THE COMME				Research Field	d: he Adressed Life- Cycle Phase			Optimization	only by	process	process-model	THE SALES	Workflow	Workflow	Workflow	Workflow	AN OPEN CORDS				Resource time		Optimal										
Name	Author	Journal / Year Conference	Journal/Conference Name	r r	he Adressed Life- Cycle Phase	Problem category	Optimization objective	objective	only for optimization, not for evaluation	Online / Offline	(i)	event-log (ii)	Workflow patterns (ii): sequential	Workflow patterns (iii): AND	Workflow pattern (iii): XOR	Workflow pattern (iii): Deferred XOR	Multi instance (iv)	Resources (v)	Resource Performance Indicators (vi)	Grouping (vii)		data (ix)	Solution method: (x) Approxim		unary/capacity	resource profile	task durat	defines tion comments:					
								comment improve process performance measured alon devils quadrangle, by improving resource usage and testing different execution options.																									
								performance measured alon	g																								
								devils quadrangle, by																									
	Low W.Z., vande Broucke S.K.L.M Wyon M.T., fer	n L						improving resource usage																									
Revising history for cost-informs	Wynn M.T., ter Hofstede A.H.M.,							and testing different															Genetic Algorithm, Integer Linear						Event Log mined as	retri			
Revising history for cost-informs process improvement	ed De Weerdt J., va der Aalst W.M.P.	2016 J	Computing	Neither	Enactment	Resource allocation, Scheduling	cost minimization	execution options	×	Online	x	x	x	×	(x)		x	x	complex	Individual	×		Integer Linear Programming, Tabu Search A/O	Comparison of Searches - GA	Sest unary multiple	performance	×	working hours, performance, u	mined as net, used tilisation simulation	n			
Process Mining-Based Method								Room planning Unequal Area Facility Layout																					Event Log				
of Designing and Optimizing the	Dismanchian F		Health Environments Research and Design				minimization of	Facility Layout Doublars																				rooms as resor					
Layouts of Emergency Departments in Hospitals	Lee Y.H.	2017 J	Journal	Neither	Design	Resource planning	routes in hospital	Problem (UAFLP)		Offine		x											Goal Programming O	7	rooms	only locations as "re	ources" -	walking time m for patients					
																													of event to	g g			
																							comparing multiple						of event to focus from process m to process	odel			
	Van Der Aalst W.		Proceedings of the 2015 IEEE 19th					Improvement o	d														event log variants by					tasks are realis	cated to performer	oe,			
Change your history: Learning from event logs to improve	M.P., Low W.Z., Wyrn M.T., Ter Hofstede A.H.M.		International Conference on Computer Supported Cooperative Work in Design, CSCWD 2015			Resource allocation,	process	Event Log by changing variable parts		Office													event log variants by utility and compatibility, Limit by utility			Performance in Ever		resources, opti through minimi	cated to performer mization test variar pation of idle with best				
processes		2015 C	CSCWD 2015	BPM	Enactment	Scheduling	improvement	variable parts		Offine		x						*	1-891	individual			multi-criteria mixed integer LP (MMP).	Limit Search 5	ace multiple, unary	Performance in Ever	Log -	times	performer				
WORKSHIFT SCHEDULING USING OPTIMIZATION AND PROCESS MINING	Guastalia, A; Sulia, E;																					data related to	integer LP (MMP), tabu search to find						Event Log hospital.	from			
PROCESS MINING TECHNIQUES: AN	Suls, E; Aringhieri, R; Branchi, S; Di							improve healthcare worker														different departments	optimal solution between MMIP and					favorite shift pe employees are combined with	terns for Process & from employed shift	odel			
TECHNIQUES AN APPLICATION IN HEALTHCARE	Francescomarine C; Ghidini, C	D, 2023 C	2022 WINTER SIMULATION CONFERENCE (WSC)	Neither	Enactment	Resource allocation, Scheduling	better roster plans	worker s schedules	x	Offine	x	x	×		×		×		complex	pooled	×	(not really process data)	tabu search to find optimal solution between MNIP and Process mining, simulation A	Tabu Search	part of shift ob	en workshifts, workshift	outerns -	combined with constraints	shift shift perspects				
																							reinforcement										
																							learning with Fitted- Q iteration (FQI) and										
								resource allocation as sequential															Neural fitted q- iteration (NFQ), Resilient										
Resource Allocation Optimization Business Processes Supported by Reinforcement	on Neubauer, TR; da Séva, VF; Fantinato, M;	-						sequential decision															Resilient Propagation algorithm as						Event Log workload the markovian	for			
Supported by Reinforcement Learning and Process Mining	Peres, SM	2022 C	INTELLIGENT SYSTEMS, PT I	Neither	Enactment	Resource allocation	optimal resource allocation	(markovian)		Online		x						x	complex	individual			algorithm as regression strategy A	Markov	multiple, unary	event log	×	the higher the lower the perfo	workload the markovian mance decision n	odel			
	Guestelle A.; Aringhieri R.; Solis E.; Amentes							of process mining directly in ILP - e.g. if a																									
	Di							patient will be delayed or not.																									
Combinion Process Minion	Francescomarino C - Chidri C -	D					salart and arbata																										
Combining Process Mining and Optimization: A Scheduling Application in Healthcare	Fonio P.; Grosso M	2023 C	Business Process Management Workshops	BDM	Enactment	Resource allocation, Scheduling	select and schedu patients from the waiting list	Operation		Online									None	pooled		Different Proce	integer linear Modeling as programming model Solving	4	more inex	event log rooms, wo	ker mouns .	model enhants	th CRIEX Riftwell or	created II P for 4 Boom	s, Patients created from e	cent los values and th	turn simulated
																				,													
							multiple, waiting	basing	y																								
								closeness of																									
								Resources in a															Allocation based on team interaction (no										
Multi-level Team Assignment in		L 2022 J	INFORMATION SYSTEMS FRONTIERS	Neither	Enactment	Resource allocation	resource utilization find minimal	n Task allocation		Online	x		×		(x)			*	complex	individual			ns algorithm) Modeling heuristic to limit	-	multiple, unary	y resource profie, soci	I worker net x	resource alloca	son through a Resource	, Network of resources of	epending on interaction b	etween resources	
Identifying a Minimum Sequence	F; Jacobsen H	2022 J	EEE Transactions on Services Computing		Design	Control-flow re-engineering	sequence of			Office													search space for A* Search O	Limit Search 5	ere .			no resource of	ncation entireteston of a	reklina channa manatin	ns, is this necessarily OR	nelsterf?	
			,																					Two PPM mod	bs								
																								PPM1 predicts	ask								
Robust solutions via cotimisatio																								times PPM2 predicts									
Robust solutions via optimisatio and predictive process monitoring for the scheduling of																								daruptions the scheduling, use PPM2 to 1	ugh								
	M. Di Cunzolo N						minimze over time and maximize resource usage	combining ppm		Office													ILP + PPM A	use PPM2 to 1 schedule mon robust*	unary								
procedures	sri., Di Curzolo, N	wa 2025	International Transactions in Operational Re	nurt	Enactment	Scheduling				urfine	×		×				×						ILP + PPM A	nobust	unary								
Simulation Optimization-Based							bed occupancy by planning beds, while keeping	y																									
model for Decision-Making in the stroke clinical pathway	P.A. Boareto, Pe	etc 2025 J	Computers & Industrial Engineering	Neither	Design	Resource planning	while keeping service times good	-1		Office									None	pooled			Genetic Algorithm A		multiple, unery								
Reinforcement learning for	,					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	optimal intervention	minimine					_				-			,				Q-learning car theory) learn a									
optimizing responses in care processes	O.A., Hundogan,	C 2025 J	Data & Knowledge Engineering	BPM	Enactment	Action recommendation	optimal intervention for patients	on patients aggressions		Online		x						x	None	pooled			RL: Q-learning, SARSA 0	theory) learn a optimal policy	unary								
Learning policies for resource allocation in business processe	s J., Middelhuis, Je	erc 2025 J	Information Systems	BPM	Enactment	Resource Allocation	minimize costs	cycle time	x	Online	x	x	×	×	×		×		1-891	individual		attributes	DRL (PPO) A		multiple, unary		×						
optimization of business processes with differentiated resources	O., López-Pintad	2024	Information Systems	DPM	Design	Resource planning	reduce resource availabilities			Office			_	L					1.00	Individual	L		Hill-climbing search (meta heuratic) A		multiple, unary								
	o., Lopez-rinted	2029 3		ur'lli	Seagn	rves-urce parring	J/SISDITES			U.SERE	*		•		*	-			rese1	-idvidual		-		solution metho not optimal du	muspie, unary		×						
Online Resource Allocation to Process Tasks Under Uncertain																							Assignment Problem + Parallel Machines Scheduling problem A	not optimal du uncertainties i online setting	to the								
Resource Availabilities	M., Kunkler, Mich	hel 2024 C	International Conference on Process Mining CENTERS - International Conference on		Enactment	Resource Allocation	minimize costs	multiple		Online		x					x	×	1-891	individual	availability	attributes	Scheduling problem A	online setting	multiple, unary		×						
			ENTERprise Information Systems / ProjitAN - International Conference on Project MANagement / HCist - International																														
Particular State Martin Management and associate	_		Project MANagement / HCist - International Conference on Health and Social Care					Job Shop Sched																3 different sce	arios:								
Scheduling Molds Manufacturin Processes through Process	9			OR	Enactment	Schartston		ulingProblem (JSSP)	•	offine									1-889	individual	availability		Genetic Algorithm A	- optimistic - pessimistic - neutral									
aring	F., Silva, Filipe; C	2024 C	ava.s	urt	Linacament	Junearing	-Askespan		-	CARRIED STATES	*		•	-		-	*		rese1	-idviduai	availability	-	German A		unary	-	×						
Combining an LNS-based approach and organizational mining for the Resource								Replace Resource																- cost function that is predefir is this really of	sed d. →								
Replacement Problem	C., Diamentini, C	ta 2024 J		OR	Enactment	Resource Allocation	Maintain operation efficiency	n Problem PetrNet		offine	x	x	×	×	×		×	×	complex	individual			ILP, Metaheuristic Sim. Annealing A, O	is this really of then?	capacity	×	×	sociogram to n	present resource hando	vers			
Date Drives Pelcelides of			Advances in Production Management																														
Cellular Manufacturing Systems Using Process Mining with Petr Nets			Systems. Production Management Systems for Volatile, Uncertain, Complex, and																					simulation of a possibilities wi petri net simul	or unary								
NECE	Kurakado, H; Nis	ani, 2024 C	Ambiguous Environments	Dr ^M	chactment	scheduling	makespan		*	criine	×	*	x	*			x	*	1404	pooled			simulator A	petri net simul	or unary								