Tableau_Analyse_Articles_Facteurs_Referencement

Code domaine	Domaine de facteur	Code	Catégorie de facteur	Type de facteur	Code	facteur	nb fact	Tot
INO	INNOVATION CARACTERISTICS	1	Intrinsinc	Technical aspects	1	interoperability among applications software	6	12
					2	Maturity of the technology / completeness / reliability / robustness		7
					3	consistent IT platform, information sharing, collaboration planning and operation integration		3
					4	hardware requirements		1
					5	modifiability / adaptability		1
					6	Type of licenses/ Licensing product to members other than owner and client		1
				Economical aspects	7	maintenance costs / running costs (recurring need for additional/associated resources) / need for frequent update /	3	8
					8	Cost of human-based service costs and BIM consulting		1
					9	Cost of technology / affordability		2
				Availability	10	availability of library	8	2
					11	availability of commercial assessment tools		1
					12	Availability of BIM training programs		13
					13	availability of framework and implementation plan / standards to guide implementation / legal framework for adopting		4
					14	availability of technical supports / documentation / noteworthy publications		6
					15	Trialability (possibility to try before deciding / availability of free trial software)		4
					16	long term providers : vendors / suppliers		3
					17	competition among the (IT) suppliers		1
				Observability	18	Communicability, demonstrability, profitability / promotion of BIM / marketing of vendors on BIM potentials /	4	6
					19	Proof of efficiency , cost savings and productivity gain by adoption		7
					20	availability of evaluation criteria and measures for firms		1
					21	Case studies		3
		2	Company-relative characteristics	Compatibility	22	BIM uses supported / applications / features	4	6
					23	Compatibility / applicability to existing processes		11
					24	BIM data schema pertinence		1
					25	nature of the construction industry (fragmentation of industry)		2
				Relative advantage or disadvantage	26	Relative advantage - disadvantage / perceived benefits / image motives	6	9
					27	Risks / share of risks with bidding BIM projects (types, size, teams, locations) / security concern (data, propagating		6
					28	cost / saving & cost reduction		2
					29	Productivity		2
					30	client's satisfaction with BIM projects		1
					31	consolidating marketing strategy		1
				Perceived Ease of Use (complexity)	32	complexity /simplicity / perceived ease of use / usability	7	9
					33	BIM standards, codes, rules, and regulations		7
					34	Convenience of BIM operation		2
					35	Ease of getting expected outcomes by BIM		3
					36	user-friendliness of BIM tools		4
					37	Frequency of errors made with BIM		2
					38	be confused or frustrated when using BIM / be comfortable		1
				Perceived Usefulness	39	Perceived Usefulness / suitability of BIM for practices, organization type, and project types / usefulness in my job (uses	3	10
					40	effectiveness (and benefits) of BIM / improvement of job satisfaction, work performance, communication, outcomes,		8
					41	Personal recognition about case of BIM operation		1
EXT	EXTERNAL CONTEXT CHARACTERISTICS	1	External context (strong)	Normative pressure	43	Availability of BIM professionals / trained professionals	11	10
					44	Consultant effectiveness / BIM knowledge within project consultants		2
					45	Contractual sharing norms, and procurement methods about ownership (contractors benefit from confusion, maturity of		8
					46	Procurement skills of client		1
					47	Devining levels of BIM working for reference in professional services agreements / advocation for the use of BIM for our		2
					48	Culture of the sector (shared identity, norms, values and assumptions) and Awareness and readiness among industry		3
					49	Standardized work procedures for BIM / Guidance on use of BIM		3
					50	Performance measures and benchmarking of continuous improvement / metrics for quantitatively evaluating the		3
					51	Reputation in the industry of other projects in BIM		1
					52	Industry standards and wide use		4
					53	National applicability		1
				Coercive	54	**client's demands**, interest, effort, support (financial / other), pressure (refusal to deal)	7	20
					55	awareness, readiness, pressures or encouragement from the **construction players** (competitors, peer association, multi-		14
					56	awareness, readiness, pressures or encouragement from **team partners and subcontractors**		17
					57	push, incentive programs, or support from government (promotion, financial support, regulation) and policy /regulatory		17
					58	Globalisation and competitive strategies		1
					59	Increase of design and build / BIM demand		1
					60	Dependance on parent company		1
		2	External context (weak)	Mimetic processes	61	Industry market trend and wide use / willingness to use BIM by stakeholders	8	4
					62	Global openess or resistance toward BIM (subjective norm) / holistic readiness		7
					63	Awareness of the technology among industry stakeholders		3
					64	earliness of adoption (in the diffusion process)		4
					65	Environmental uncertainty		1
					66	Mimicking behaviours by imitating successful practices/competitors in the market		1
					67	Mimetic isomorphism in technology selection		1
					68	Willingness to recommend others to use BIM / recommand BIM to colleagues		2
INT	INTERNAL CONTEXT CARACTERISTICS	1	Culture	Identity, demographic and strategy	70	Organizational vision, challenges, policy and project strategy	13	3
					71	size (number of employees) / human resource		3
					72	experience (date de création de l'entreprise)		2
					73	specialisation / service		2
					74	Financial resources of organization		2
					75	Financial perspectives and economical health / ability to create business opportunities and possibilities		4
					76	hiring strategy (hiring people to keep knowledge) / outsourcing		2
					77	Organizational flexibility/adaptability to market / learning capability		2
					78	differentiation in market (unique products or services in a large market) / niveau de spécialisation		1
					79	level of internationalization		1
					80	Future needs		1
					81	technological capability of organization		1
					82	Brand image and identity communication / reputation		2
				Projects	83	physical size and cost of a project (square meters, cost and duration)	6	3
					84	complexity of projects (building shape or building systems)		1
					85	use of buildings (hospital, office, factory, etc)		1
					86	project delivery systems		1
					87	design changes ofteness		1
					88	project delivery system		1
				Innovativeness	89	organisational innovativeness	6	2
					90	Investments and initiatives / continuous investment / Financial resources devoted to IT technologies / software		4
					91	Intensity of IT integration		2
					92	Trainings ofteness		1
					93	Research and development capability of organisation		1
					94	resistance/openess to change		1
				Effectiveness	95	Availability and effectiveness of operations systems	2	1
					96	Cross cultural effectiveness among memebers of organization		1
		2	Interactions	Collaboration	97	internal information flows / information-sharing protocols	7	5
					98	human capability resources		1
					99	cross-training (job rotation)		1
					100	shared goals and values		1
					101	social network		1

Category	Subcategory	Sub-subcategory	#	Description	Val1	Val2
			102	coordination and collaboration, collective efficacy, open discussion environment, colleague helps and		6
			103	workspace environment		1
	Distribution of power hierarchy		104	project leadership style (democracy/autocracy)	7	2
			105	level of bureaucracy		1
			106	Leadership of senior management / corporate management style / strong leader		4
			107	centralization / decentralization of decisions		2
			108	organizational complexity		2
			109	management : availability and effectiveness of managerial style / management's competence and will		3
			110	openess		1
	Partners		111	quality of relationships with partners and subcontractor / effective collaboration among project participants / trust and	3	7
			112	willingness to share information among project participants		5
			113	relationship with the client		1
3 Systems	Software		114	tools	5	1
			115	collaboration (project) management tools		1
			116	software distribution		1
			117	IT infrastructure / ICT infrastructure		3
			118	Satisfaction with current technology /existing cad systems that are already adequate in fullin the design and drafting		4
	Hardware		119	Network fiability (power, internet)	2	1
			120	hardware and devices /data storage capabilities		3
	Processes		121	IS infrastructure	5	1
			122	project control		1
			123	production process		1
			124	early involvement of project teams (owners, manahgers, architects, engineers,c ontracts, subcontractors)		2
			125	design process / project organization		2
4 People	Top management		126	master BIM model manager	5	3
			127	understanding of BIM processes and workflows / awareness / knowledge		7
			128	personal innovativeness and openess to change (or resistance to change / change aversion) / employees' motivation to		9
			129	liking in new technology / using tools, devices, etc / apprehension towards new technology		2
			130	ability to accept criticism		1
	employees		131	ancienneté et expérience	11	1
			132	self efficacy / computer self-efficacy		3
			133	experience (années d'expérience, pas en BIM)		2
			134	technical and technological competence of staff (IT expertise)		4
			135	BIM trained, skills and expertise for high level of BIM (BIM personnel) in-house staff / BIM project experiences / Pre-		14
			136	understanding of BIM processes and workflows / awareness / knowledge		7
			137	worker attitudes and ethical behavior		1
			138	variation in practitioners' skills		1
			139	liking in new technology / using tools, devices, etc / apprehension towards new technology		2
			140	adoption of colleague		1
			141	willingness to collaborate		1

CHG — CHANGE CHARACTERISTICS

Category	Subcategory	Sub-subcategory	#	Description	Val1	Val2
1 Dimension	Extent		143	Need for BIM personnel and training	4	5
			144	Needs for change in organization characteristics for BIM (types, size, structure, systems, culture, styles, processes) /		7
			145	Needs for change and upgrading in hardware, software		1
			146	Quantity of projects/activity that need to be adapted		0
	Depth		147	Perceived ease of implementation or incorporation into existing processes / time required / difficulty for learning /	5	12
			148	investment cost for BIM / perceived cost / set-up cost / cost of implementation		15
			149	Perceived risk for implementation (initial productivity affection, etc)		3
			150	perceived need for organizational restructure		1
			151	perceived readiness (technical, readiness, organizational, procurement, policy)		1
	Rythm		152	Time available for implementation / necessity / urgence	2	0
			153	Time souhaitable for implementation		0
2 Interest and involvement	Base		154	Base		0
			155	Déductif/inductif		0
	Motives		156	Objectives, common objectives / needs (performance, etc) / necessity for future works / benefits motives / Project-based	4	5
			157	There are many : maybe not interesting to note		1
			158	subjective norm (perceived expectations from others for adoption)		2
	Attitude towards change		159	senior management support, reluctance or pressures / (top management support) (internal motivation to actively	11	9
			160	Individual and group motivation to adopt BIM / interest / behavioral intention to use / continue using		6
			161	team engagement		1
			162	Project manager's interest an dwillingness in adopting BIM		1
			163	consensus on appropriation		1
			164	attitude towards BIM / change (positive / negative)		3
			165	interest in learning BIM		1
			166	Opinion on the idea to use BIM (think it's a good idea/bad idea)		2
			167	Appréciation de l'utilisation (appraising) (j'aime utiliser)		1
			168	organizational intention of Bim acceptance		1
			169	individual intention of Bim acceptance		2
3 Practical implementation	Change agent &		170	level of bureaucracy (for BIM adoption decision-making)	6	1
			171	approach for BIM : in-house ressources or outsourcing		2
			172	Team pilot project		1
			173	interdisciplinary of team for pilot project		1
			174	dedicated BIM/information manaager		1
			175	clear definition of roles		2
	Pilot Project		176	Pilot project		0
	Training		177	Training process and learning curve	7	3
			178	provide technical training		1
			179	Customization and capability challenge		1
			180	Training on strategic issues		0
			181	provide a common data environment (CDE)		1
			182	make sure the processes are in a logical order (sequence)		1
			183	select appropriate tools to perform the applications		1
	Method and strategy		184	clear definition of Implementation plan and clarity of implementation process / document BIM execution plan including,	7	3
			185	Choice of a Pilot project (size (square meters, cost and duration)		1
			186	definition of project goals clear definition of objectives and requirements before formation		1
			187	clear definition of processes / determine model content requirement (data exchange, information exchanges, reference		1
			188	clear definition of objectives and requirements		1
			189	managing people resistance to Bim change		1
			190	adopt lean process (pull flow)		1
	Communication		191	Communication level (Openess for discussion about innovation)	5	1
			192	Communication type		0
			193	adopt effective communication, collaboration, coordination practices and use adequate communication coll coor tools		2
			194	setup feedback loop for process improvement (continuous improvement)		1
			195	raise issues as soon as they emerge		1
	KPI / metric measurement		196	client satisfaction - product	9	1
			197	client satisfaction - service		1
			198	defects		1
			199	predictability - cost / time		1
			200	profitability / productivity /return on investment / performance		2
			201	construction - cost / time		1
			202	setting check points during the project's lifecycle		1
			203	level of stress during implementation		0
			204	level or errors during implementation		0

Risk management	**205**	define model authors, users, managers throughout project life cycle / avoiding/hiding potential risks and liability	3	2		X ... X
	206	legal issues around ownership, IP&PI insurance terms		4		X ... X ... X ... X
	207	selection of project delivery methods (design-build, design-bid-build, CM) / sharing of risks and rewards among team members that are tied to project success / defining of the contracting/contract arrangement / definition of terms of payment / selection criteria for procurement (cost based, quality-cost based)		2		X ... X