Who	Ref	Last Active	Verified In-Scope	Process Management	Digitisation	Checking/Generating	Interoperability with Asset Data	Status
AEC3 Require1	1.2.14	Available 2012 onwards	Y	User Mark-up of regulations or requirements. Reports rules back as table and tree. User developed dictionary. Set up and test project of federated models. Displays overall result and causes. Notifies team by email. Solicits further information if needed	Independent rule engine tracking true, false, unknown. Accelerated heuristics	Checking performed based on rules	Inputs - html/rase and ifc/bim. Generates dmn, basic code, ifc constraints.	Industrialisation
Autodesk Model Checker	1.2.3	Currently freely downloadable (https://www.biminteroperabilitytools.com/modelchecker.php) Model Checker and Model Checker Configurator are part of Autodesk BIM Interoperability Tools.	Y	Set up Revit plugin by selecting a checkset (custom or downloaded from checkset library) and refining which checks to run, specify model(s), run check, visualise results in report GUI, report GUI can link to Revit modelling view dynamically, amend model in Revit, run check again etc..	GUI-based model checker configurator, predefined check sets for some regulations available from web page	Custom checks can be on model, annotative, location, datum elements or views, but can also be on model integrity.	Revit	Commercial
BIM Direct	1.2.6	Currently available (https://www.bimdirect.com)	N	Web portal for employer's information requirements management. Create project, assign tasks to collaborators, create EIR from PAS1192-compliant template, edit project collaboratively, issue tender	Intrinsically compliant with PAS 1192 specifications for collaborative working and information and ISO 19650 standard for BIM-based information management about construction works	No code checking. Maintains EIR's compliance with PAS 1192 and ISO 19650	BIM level 2, digital project management tool	Commercial

BriefBuilder	1.2.5	Currently available (https://www.briefbuilder.com/for-whom/)	Y	Define requirements at building/room level, link requirements to BIM objects, validate against client requirements	GUI-based requirement captures and linkage with 3D BIM objects	Checks models against client requirements	IFC, Revit	Commercial
CARS	NA	https://www.youtube.com/channel/UCFZDP2rDosnlnfg7qZNzikA?view_as=subscriber	Y	Provides ability to draft structured requirements, review, publish and manage regulatory documents, from document and clause level. Allows full versioning and tools to manage audit trail of regulation changes.	. Also will provide tools to digitise regulations – i.e. convert the written information in to machine readable (xml data model) initially with substantial manual intervention for testing but with intention to use natural-language programming. Specifically used for the production of the DMRB (Design Manual for Roads and Bridges) by Highways England.	Does not directly execute rules but will shortly be able to output rules (through API) in machine readable formats that can be executed by road design packages.	As previously, does not directly interface with asset data but can output rules in machine readable formats that can be used by road design tools	Internal use by Highways England

DEMplus	1.2.9	Currently available (http://www.orekasolutions.com/demplusfornuclear/demplusfornuclear_en.html)	N	User inputs nuclear process scenario and involved physical objects via 3D models (including IFC), then DEMplus dosimetry, cutting, collision and kinematic modules are used to provide (possibly immersive) 3D simulation. The tools reports costs, duration, waste and radiation dose.	No code digitisation per se. DEMPlus integrates the ALARA (as low as reasonably achievable) approach to radiation protection	Safety of nuclear processes is evaluated by a human assessor through the reports produced by 3D simulation from DEMPlus	IFC and generic 3D formats	Commercial
DesignCheck	1.1.3	2010 publication from David Greenwood (http://nrl.northumbria.ac.uk/6955/)	Y	IFC models are translated into DesginCheck object schema using an EXPRESSX-defined transformation. Different rule schemas are used according to the design stage. Checking results are text based.	Predefined rules for the Australian building code, written using EDM	DesignCheck selects the subset of regulations to check against according to the design stage. EDM-based object rules.	IFC	Research
dRofus	1.2.2	Currently available (https://www.drofus.no/en/download/)	N	Capture user requirements using GUI. Define early-phase requirements. Import room data from Excel, Revit, ArchiCAD, and IFC. Define additional dRofus room parameters.	No code digitisation per se.	No code checking. Room data validation against user requirements using IFC.	IFC, Revit, ArchiCAD	Commercial
GliderBIM	1.2.8	Currently available (https://gliderbim.com/#licensing)	Y	collaborative lifecycle asset information management	GUI-based validation ruleset editor	automated model validation against rulesets	IFC	Commercial

Jotne EDMmodelchecker	1.2.2	Not advertised as a feature of EDM model server anymore (http://www.jotneit.no/express-data-manager-edm)	Y	Define rules and constraints as an EXPRESS schema, import STEP/IFC file, validate against schema, visualise violations in HTML format (http://jotne.custompublish.com/index.php?id=512200&showtipform=1&cat=78897)	Rules written using Express and ExpressX languages	Built on Jotne's EXPRESS Data Manager, EDM SDK provides bindings for C, C++. .Net, Java and Visual Basic (https://conwik.jotne.com/display/EDM/EDMsdk)	IFCSTEP, IFC and ifcXML	Previously Commercial
LicA	1.1.4	2013 publication from João Poças Martins (https://doi.org/10.1016/j.autcon.2012.08.008)	Y	GUI application LiCAD can be used to interact with LicA. Users can import/design hot and cold piping network models in the 3D view. Checking results are overlayed over the 3D models using colours.	Predefined rules for Portugal water distribution system regulations, developed in T-SQL for integration in SQL-server database	LicA database can be queried by software tools using ODBC, including results of checking routines.	The authors proposed a workflow in which the first step is automated conversion from IFC to LicA internal object model, but no actual implementation?	Research
NBS Toolkit	1.2.7	Free-to-use online tool (https://toolkit.thenbs.com)	N	PAS 1192-compliant collaborative BIM management platform.	Intrinsically compliant with PAS 1192 specifications for collaborative working and information.	No code checking.	BIM level 2, digital project management tool	Industrialisation
PlanX	1.2.4	Currently in beta and not publicly	N	Councils design their instance of PlanX with OpenSystemsLab (during this stage planning policies are converted into	Predefined checking rules for	In addition to web-based GUI, PlanX also provides an API for third-party software	None. Local authorities	Industrialisation

		available (https://www.planx.uk/About)		software code), then instance of PlanX is deployed. Councils can decide to host the instance themselves.	UK local planning policies	tools (https://files.cargocollective.com/c233603/Planx_doc_1.6.1.pdf)	can use PlanX to generate question-based web applications.	
RegBIM	1.1.1	2015 publication from Tom Beach (https://doi.org/10.1016/j.eswa.2015.02.029)	Y	Ability to submit IFC files, specify missing data and produce report in a tree like diagram. Simple Integration with Bentley systems software performed.	Mark-up building regulation documents using RASE method	Checking against regulations specified in RASE using a rule-based approach.	IFC	Proof of Concept
SimpleBIM	1.1.12	Currently available (http://www.datacubist.com/buy-it/)	N	Import IFC file, validate IFC data, trim, edit, enrich, merge IFC resources, relocate parts of models, export new IFC file.	No code digitisation per se. Validation and editing scripts can be created using predefined automation templates or the programming API.	No code checking. Data validation according to target use of the IFC model. Can be used to clean up and/or enrich IFC models prior to checking with a third-party IFC-enabled tool.	IFC	Commercial

Singapore {CORENET} e-PlanCheck	1.2.2	Integrated with currently active Singapore's CORENET e-Submission System (https://www.corenet-ess.gov.sg/ess/)	Y	Prepare BIM models in accordance to CORENET e-submission code of practice, use e-submission software tool to create a project, export application form, submit application form online with BIM models, CORENET can check planning approvals, building plans approvals, structural plans approvals, temporary occupation permit, fire safety certificate, certificate of statutory completion	Building codes implemented using FORNAX development platform (C++)	Checking by proprietary expert system by Nova (ePlanCheck http://www.nova-hub.com/e-government/). Online trial for a limited set of Singapore regulation clauses available at http://www.fornaxcloud.com.	Architectural, structural or MEP models from Revit, ArchiCAD, Bentley, Tekla	Previously Commercial
SMART review	1.2.3	Currently available (https://smartreview.biz/home)	Y	SMARTreview APR for architects to check compliance of building design, SMARTreview CPR to generate planning application for the regulatory authority to review (from APR's results)	Predefined checking rules for the International Building Code	Produces detailed textual checking review in navigable HTML (https://smartreview.biz/example_apr)	Revit	Commercial

SMARTcodes	1.2.10	Last available from ICC website in 2007	Y	Mark up textual regulation documents using SMARTcodes Builder. Mark ups are translated into an IFC constraint model, which can then be used as a rule base in an IFC validation software tool (http://www.aec3.com/en/downloads/BuildingRegulations.pdf).	Use International Building Codes in XML format or mark-up building regulation documents using early RA(S)E method	Performs code checking based on specified rules	IFC	Industrialised
Solibri Model Checker	1.2.1	Currently active (https://www.solibri.com/download-solibri-model-checker-trial/step=1)	Y	The embedded checking process is strongly based on practical needs: 1) Import and coordinate various IFC files 2) customizable structuring of multi-disciplinary models with the help of rule-based classifications 3) Validation of various customized qualitative aspects on the basis of the specified generic structures (e.g. IFC validation, component dimensions, spaces, clearance of openings...) according to best practices or custom rulesets 4) Review validation results and decision making in 3D viewer (can be combined with customized information take off as plausibility check) 5) Communication and dissemination of identified problems	50+ generic Rule Templates which can be combined individually to rulesets using the GUI-based Ruleset Manager. Numerous sample rulesets are delivered as standard content. No programming knowledge required for the application (https://www.solibri.com/learn/creating-rulesets-in-smc-v9-8)	Multi-platform Java-based GUI and rule engine. The newly released Solibri Developer Platform (SDP) allows customers to create customized Rule Templates. For this, programming knowledge is required. (https://www.solibri.com/news/interview-with-pascal-loisel)	IFC	Commercial

Solvassure	NA	https://www.solvassure.com/	Y	Platform that is based around pre-defined compliance checks to activity owners from a rules library, presenting exceptions to nominated stakeholders in real time, with full accountability.	Licensed by the FCA and the PRA. Can include any predefined checking rules from regulations and standards	Gateway enabled system disallowing departures from the regulation compliance.	Any structured database system	Commercial
UpCodes AI	1.2.13	Beta version download (https://up.codes/ai)	Y	Run code check on current Revit model, visualise list of code violations, display selected violating elements in floorplan/3D view	Predefined checking rules for a variety of US state building codes.	Does not impose any constraint on how the Revit model should be created (http://www.aecbytes.com/feature/2018/CodeCheckingUpdates2018.html)	Revit	Industrialisation
usBIM.code	1.2.11	Currently available (https://www.accasoftware.com/en/bim-management-software)	N	Use the online usBIM.platform to manage BIM assets from different disciplines, use usBIM.code to check BIM models. Import IFC model to CodeMaker, add data required for checking with the visual editor, export the IFC file with new data.	(3D) GUI-based editor to add required IFC properties and to create rules (CodeMaker)	Checks against user-defined project requirements. Italian page of the tool seems to give many more details (https://www.acca.it/bim-model-checking-software)	IFC	Commercial
Xinaps	1.2.3	VERIFI3D software currently available (http://verifi3d.com)	Y	Visualise analysis results within Revit (KPI summary, floorplan/3D visualisation of passed/failed elements.	Predefined checking rules for a variety of local accessibility and fire safety standards/regulations	Pathfinding algorithm parameterised by accessibility profiles (e.g. pedestrian, wheelchair, shopping cart, hospital bed...). Similarly egress time calculation algorithm.	Revit	Commercial