I. Introduction

BIM Excellence is a unique research-based approach to digital innovation in the construction industry. It provides an integrated methodology and a modular language for performance assessment, learning and process optimisation. The BMe Initiative is not-for-profit effort based on the BIM Excellence approach and is guided by a set of Principles. The Initiative is undertaken by volunteer researchers and is supported by in-kind contributions, commercial services, and institutional/corporate sponsorship.

This document must be read in conjunction with 101in BMe Initiative Explainer, 102in BMe Knowledge Structures, and 103in BMe Initiative Projects (refer to list of publications). The BIM Excellence approach and the BMe Initiative are based on the published research of Dr. Bilal Succar and a growing cohort of esteemed international collaborators.

II. How to use this document

The Competency Table can be used to organise Competency Items – whether developed by the BMe Initiative or by others - and to provide a structure for:

→ Developing assessment modules for evaluating and comparing the abilities of individuals, groups and whole organisations;
→ Developing competency-based certification regimes and accreditation programmes;
→ Developing learning units and competency-based educational programmes; and
→ Identifying competency profiles of varied roles across markets and disciplines.

The Competency Table is structured according to the published Competency Hierarchy which includes 3 Competency Tiers: Core Tier, Domain Tier and Execution Tier. This document focuses on the Domain Tier1 and its 8 Competency Sets and 55 standard Competency Topics. Each of the standard topics includes 10s or 100s of Competency Items, a Competency Item is a ‘phrase/sentence’ representing an ability, activity or outcome that can be assessed, learned or applied. Each Competency Item belongs to a specific Competency Topic (e.g. Collaboration) within a specific Competency Set (e.g. Functional Set). Below are three sample Competency Items:

→ prepare a 3D model for Construction Scheduling
→ facilitate Model-based Collaboration between a team of structural engineers on a bridge project
→ maintain BIModels generated using standardised Protocols

Competency Items are applicable at specific Organizational Scales and Granularity Levels3, and are used to populate assessment modules and training lessons. They can also be collated into checklist/task list templates and modular project workflows (see example).

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1 Refer to the Competency Tiers model on the BIM Framework blog: http://bit.ly/Competency-Tiers.
2 Standard competency topics apply within the BIM domain and vary across other domains (e.g. PLM or GIS). The taxonomy allows for non-standard topics provided these do not overlap or contradict with Standard Topics.
III. Competency Sets and Topics

Competency Items are identified using a specialized Competency Flow Diagram, collated into an expanding Competency Inventory, and organised under four primary competency sets - Managerial, Functional, Technical, and Supportive - and four secondary competency sets – Administration, Operation, Implementation, and Research & Development. All these competency sets and the majority of their topics are applicable across multiple domains (e.g. construction, geospatial and manufacturing) and their respective information systems (e.g. BIM, GIS and PLM).

The tables below provide a summary of the 8 Competency Sets and 55 Competency Topics. The short descriptions are derived from the BIM Dictionary.

Managerial Set

Summary: the decision-making abilities which drive the selection/adoptions of long-term strategies and initiatives. Managerial competencies include leadership, strategic planning, and organizational management.

<table>
<thead>
<tr>
<th>CODE</th>
<th>COMPETENCY TOPIC</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>M01</td>
<td>General Management</td>
<td>Defining and communicating overall managerial goals from adopting new systems and workflows</td>
</tr>
<tr>
<td>M02</td>
<td>Leadership</td>
<td>Leading and guiding others throughout the process of implementing new systems and workflows</td>
</tr>
<tr>
<td>M03</td>
<td>Strategic Planning</td>
<td>Identifying strategic objectives and developing implementation strategies</td>
</tr>
<tr>
<td>M04</td>
<td>Organizational Management</td>
<td>Identifying the organizational changes necessary for instigating, monitoring and improving BIM Adoption</td>
</tr>
<tr>
<td>M05</td>
<td>Business Development and Client Management</td>
<td>Maximizing the value achieved by the organization and its clients from BIM tools and workflows</td>
</tr>
<tr>
<td>M06</td>
<td>Partnership and Alliencing</td>
<td>Initiating partnerships and alliances with other organizations based on BIM Deliverables and workflows</td>
</tr>
</tbody>
</table>

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5 The BIM Excellence platform (http://BIMexcellence.com) collates thousands of competency items across all sets and topics. These are used to conduct corporate assessments and not-for-profit, international benchmarking activities.

6 The naming of competency sets and topics are based on published research and have been calibrated through hundreds of assessments and user feedback. However, topics descriptions are not static but are continuously updated to reflect new research and additional user feedback. Unless a very recent version of this document is available (check Change Log), please refer to the online BIM Dictionary for all descriptions (e.g. M03 Strategic Planning > http://BIMdictionary.com/strategic-planning)
# Administration Set

**Summary:** the day-to-day organizational activities required to meet and maintain strategic objectives. Administration competencies include tendering and procurement, contract management, and human resource management.

<table>
<thead>
<tr>
<th>CODE</th>
<th>COMPETENCY TOPIC</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A01</td>
<td>Administration, Policies and Procedures</td>
<td>Developing managerial initiatives into policies and procedures to facilitate the adoption of BIM tools and workflows</td>
</tr>
<tr>
<td>A02</td>
<td>Finance, Accounting and Budgeting</td>
<td>Planning, allocating and monitoring the costs associated with BIM Adoption</td>
</tr>
<tr>
<td>A03</td>
<td>Performance Management</td>
<td>Assessing organizational BIM capability/maturity, Individual Competency and project performance using standardized metrics</td>
</tr>
<tr>
<td>A04</td>
<td>Human Resource Management</td>
<td>Planning, developing and managing human resources as to align staff competencies to organizational BIM goals</td>
</tr>
<tr>
<td>A05</td>
<td>Marketing</td>
<td>Promoting an organization’s BIM Capability to its clients and business partners</td>
</tr>
<tr>
<td>A06</td>
<td>Tendering and Procurement</td>
<td>Developing the necessary specifications and documents to pre-qualify, recommend or procure BIM products and services</td>
</tr>
<tr>
<td>A07</td>
<td>Contract Management</td>
<td>Administering the contractual documentation underlying Collaborative BIM Projects and workflows</td>
</tr>
<tr>
<td>A08</td>
<td>Risk Management</td>
<td>Managing the risks associated with using BIM tools and collaborative workflows</td>
</tr>
<tr>
<td>A09</td>
<td>Quality Management</td>
<td>Establishing, managing and controlling the quality of models, documentation and other Project Deliverables</td>
</tr>
</tbody>
</table>

# Functional Set

**Summary:** the non-technical, overall abilities required to initiate, manage and deliver projects. Functional competencies include collaboration, facilitation and project management.

<table>
<thead>
<tr>
<th>CODE</th>
<th>COMPETENCY TOPIC</th>
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</tr>
</thead>
<tbody>
<tr>
<td>F01</td>
<td>Functional Basics</td>
<td>Identifying the basic requirements and main deliverables expected from using BIM tools and workflows</td>
</tr>
<tr>
<td>F02</td>
<td>Collaboration</td>
<td>Preparing the documentation necessary to enable Model-based Collaboration between Project Participants</td>
</tr>
<tr>
<td>F03</td>
<td>Facilitation</td>
<td>Facilitating the process of BIM collaboration between Project Participants</td>
</tr>
<tr>
<td>F04</td>
<td>Project Management</td>
<td>Managing projects where BIM Workflows are used, and BIM deliverables are specified</td>
</tr>
<tr>
<td>F05</td>
<td>Team and Workflow</td>
<td>Managing teams involved in the delivery of BIM Projects</td>
</tr>
<tr>
<td></td>
<td>Management</td>
<td></td>
</tr>
</tbody>
</table>
## Operation Set

**Summary:** the daily, hands-on individual efforts required to deliver a project or part/aspect of a project. Operational competencies include designing, simulating and quantifying.

<table>
<thead>
<tr>
<th>CODE</th>
<th>COMPETENCY TOPIC</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>General Modelling</td>
<td>Using software tools to model project requirements and generate <a href="#">Model-based Deliverables</a> across industries, information systems and knowledge domains</td>
</tr>
<tr>
<td>002</td>
<td>Capturing and Representing</td>
<td>Using software tools and specialized equipment to capture and represent physical spaces and environments</td>
</tr>
<tr>
<td>003</td>
<td>Planning and Designing</td>
<td>Using software tools for conceptualization, planning and design</td>
</tr>
<tr>
<td>004</td>
<td>Simulating and Quantifying</td>
<td>Using software tools to conduct various types of model-based simulations and estimations</td>
</tr>
<tr>
<td>005</td>
<td>Constructing and Fabricating</td>
<td>Using <a href="#">BIModels</a> for the specific purposes of construction and fabrication</td>
</tr>
<tr>
<td>006</td>
<td>Operating and Maintaining</td>
<td>Using models to operate, manage and maintain a <a href="#">Facility</a></td>
</tr>
<tr>
<td>007</td>
<td>Monitoring and Controlling</td>
<td>Using models to monitor <a href="#">Building Performance</a> or control its spaces, systems and equipment</td>
</tr>
<tr>
<td>008</td>
<td>Linking and Extending</td>
<td>Linking <a href="#">BIModels</a> and their components to other databases</td>
</tr>
<tr>
<td>009</td>
<td>Custom Modelling</td>
<td>Using software tools to deliver a custom combination of <a href="#">Model-based Deliverables</a> reflecting a variety of <a href="#">Model Uses</a></td>
</tr>
</tbody>
</table>

## Technical Set

**Summary:** the abilities required to generate [Project Deliverables](#) across disciplines and specialties. Technical competencies include modelling, drafting and model management.

<table>
<thead>
<tr>
<th>CODE</th>
<th>COMPETENCY TOPIC</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>T01</td>
<td>General IT</td>
<td>Installing, managing and maintaining general IT infrastructure</td>
</tr>
<tr>
<td>T02</td>
<td>Software Systems</td>
<td>Selecting, deploying and maintaining software systems in a multi-user environment</td>
</tr>
<tr>
<td>T03</td>
<td>Hardware and Equipment</td>
<td>Specifying, recommending or procuring computer hardware and equipment</td>
</tr>
<tr>
<td>T04</td>
<td>Modelling</td>
<td>Generating <a href="#">BIModels</a> based on pre-defined <a href="#">Modelling Standards</a> and protocols</td>
</tr>
<tr>
<td>T05</td>
<td>Documentation</td>
<td>Generating drawings and construction documents using standardized details and workflows</td>
</tr>
<tr>
<td>T06</td>
<td>Presentation and Animation</td>
<td>Generating professional-quality renderings or 3D animations using <a href="#">Specialized Software Tools</a></td>
</tr>
<tr>
<td>T07</td>
<td>Model Management</td>
<td>Managing and maintaining <a href="#">BIModels</a> generated using standardized processes, protocols and specifications</td>
</tr>
<tr>
<td>T08</td>
<td>Document Management</td>
<td>Using <a href="#">Document Management Systems</a> or similar to store, manage and share files and <a href="#">BIModels</a></td>
</tr>
</tbody>
</table>
### Implementation Set

**Summary:** The activities required to introduce BIM concepts, tools, and workflows into an organization. Implementation competencies include component development, standardization, and technical training.

<table>
<thead>
<tr>
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<th>COMPETENCY TOPIC</th>
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</tr>
</thead>
<tbody>
<tr>
<td>I01</td>
<td>Implementation Fundamentals</td>
<td>Identifying and managing issues associated with BIM implementation</td>
</tr>
<tr>
<td>I02</td>
<td>Component Development</td>
<td>Implementing a structured approach for developing or customizing Model Components using documented Modelling Standards</td>
</tr>
<tr>
<td>I03</td>
<td>Library Management</td>
<td>Developing or managing component libraries as required for the standardized delivery of BIM Projects</td>
</tr>
<tr>
<td>I04</td>
<td>Standardization and Templates</td>
<td>Generating standardized templates, item lists and workflows for initiating, checking or delivering BIM Projects</td>
</tr>
<tr>
<td>I05</td>
<td>Technical Training</td>
<td>Developing a BIM Training Plan or maintaining a Skill Register to track staff training and their acquired skills</td>
</tr>
<tr>
<td>I06</td>
<td>System and Process Testing</td>
<td>Assessing the capability/compatibility of systems and the suitability of workflows and procedures</td>
</tr>
<tr>
<td>I07</td>
<td>Guides and Manuals</td>
<td>Developing guides, manuals or educational material covering Model-based Workflows</td>
</tr>
</tbody>
</table>

### Supportive Set

**Summary:** The abilities needed to maintain information technology and communication systems. Supportive competencies include data and network support, equipment support, and software troubleshooting.

<table>
<thead>
<tr>
<th>CODE</th>
<th>COMPETENCY TOPIC</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>S01</td>
<td>General IT Support</td>
<td>Troubleshooting software issues and supporting staff in resolving technical problems</td>
</tr>
<tr>
<td>S02</td>
<td>Data and Network Support</td>
<td>Managing and maintaining the storage of data, documents, 2D Drawings and BIModels</td>
</tr>
<tr>
<td>S03</td>
<td>Equipment Support</td>
<td>Developing specifications for BIM Hardware and BIM Hardware Deployment Programmes</td>
</tr>
<tr>
<td>S04</td>
<td>Software Support</td>
<td>Addressing issues related to BIM Software Tools, fulfilling relevant Support Tasks and managing the relationship with software vendors/resellers</td>
</tr>
<tr>
<td>S05</td>
<td>Software and Web Development</td>
<td>Developing extensions for BIM Software Tools, productivity software or web portals to improve BIM Deliverables</td>
</tr>
</tbody>
</table>
Research and Development

Summary: The abilities required to evaluate existing processes, investigate new solutions and facilitate their adoption - within the organization or by the larger industry. R&D competencies include change management, knowledge engineering and industry engagement.

<table>
<thead>
<tr>
<th>CODE</th>
<th>COMPETENCY TOPIC</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>R01</td>
<td>General Research and Development</td>
<td>Conducting general or BIM-specific research and development activities</td>
</tr>
<tr>
<td>R02</td>
<td>Strategy Development and Planning</td>
<td>Developing a <a href="#">BIM Implementation Strategy</a> or a <a href="#">BIM Implementation Plan</a> to guide BIM Adoption</td>
</tr>
<tr>
<td>R03</td>
<td>Teaching and Coaching</td>
<td>Developing BIM training material to educate staff and facilitate the BIM Adoption process</td>
</tr>
<tr>
<td>R04</td>
<td>Knowledge Management and Engineering</td>
<td>Developing a <a href="#">Knowledge Management Strategy</a> and capturing/representing the BIM-specific knowledge of staff</td>
</tr>
<tr>
<td>R05</td>
<td>Change Management</td>
<td>Developing a <a href="#">Change Management</a> strategy that accompanies/supports the BIM Implementation process</td>
</tr>
<tr>
<td>R06</td>
<td>Research and Analysis</td>
<td>Participating in and/or publishing academic research focused on BIM innovation or collaboration</td>
</tr>
<tr>
<td>R07</td>
<td>Industry Engagement and Knowledge Sharing</td>
<td>Sharing BIM knowledge and experience with the wider industry through formal/informal workshops, seminars and presentations</td>
</tr>
</tbody>
</table>

IV. Change Log

<table>
<thead>
<tr>
<th>VERSION</th>
<th>DATE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1-0.9</td>
<td>Jan 2013 - July 2014</td>
<td>Test Distribution as part of beta testing and research validation</td>
</tr>
<tr>
<td>1.0-1.3</td>
<td>Aug 2014 – May 2016</td>
<td>Limited Direct Distribution through private channels</td>
</tr>
<tr>
<td>1.4</td>
<td>May 23, 2016</td>
<td>First Public Release through social media</td>
</tr>
<tr>
<td>2.0</td>
<td>Dec 13, 2017</td>
<td>Text simplification – removal of discussion covering Knowledge Blocks</td>
</tr>
</tbody>
</table>

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VI. Contact Info

If you found this document beneficial and would like to contribute to the BIMe Initiative, please contact Bilal Succar (bsuccar@changeagents.com.au | +61 412 556 671). You can also follow the BIMe Initiative’s news and document releases on Twitter (@bimexcellence), [Facebook](#), [Google+](#) and [LinkedIn](#); thank you.