

## I. Introduction

This strategy aims to identify the mechanisms and resources required to structurally extend the **Macro Adoption Project** ([BIMe Initiative Project E](#)) and position it more clearly as the *leading worldwide research effort* for country-scale BIM adoption, policy development, and digital transformation across Built Environment sectors and disciplines.

## II. Project Objectives

The Macro BIM Adoption Project has four complementary objectives:

### A. Objective A

Position the effort as a worldwide leading research effort for country-scale BIM adoption and digital transformation, policy development across Built Environment sectors and disciplines. This objective will be achieved by:

- Becoming the top recognised international framework for analysing Macro BIM Adoption;
- Becoming an international reference for policymakers seeking advice about digital transformation (assessment, benchmark, development of initiatives, roadmaps, etc.); and
- Achieving academic leadership through rigorous framework development and academic publications in recognised peer-reviewed journals.

### B. Objective B

Investigate the adoption of Building Information Modelling (BIM) tools and workflows. This objective will be achieved through:

- Capturing key adoption indicators and map the effects of policy interventions on digital transformation across the Built Environment;
- Assessing the availability and maturity of the common components necessary for enabling BIM adoption success at the macro scale;
- Benchmarking different markets and identify BIM adoption gaps; and
- Monitoring - through repeat assessments and data analytics - the diffusion of digital tools and workflows over time.

### C. Objective C

Provide resources and tailored advice for policymakers to assist them in developing and/or improving their BIM adoption policies, strategies, and roadmaps. This objective will be achieved through:

- Collating lessons learned from different BIM adoption case studies in different countries and then sharing these with decision-makers through a continually evolving policy guide; and
- Enriching the policy guide with use cases and decision support templates that - supported by open-access resources and data collection/analysis tools - can be customised to facilitate national digital transformation efforts across the world.

## D. Objective D

Develop and maintain a network of worldwide subject matter experts to assess adoption, collate policy intervention data, and continuously improve the investigation and available resources. This objective will be achieved by:

- Expanding the community of volunteers operating as part of the BIME Initiative across its interconnected projects; and
- Establishing a worldwide network of project participants through dedicated collaboration agreements.

## III. Project Metrics

The Macro Adoption Project (BIME Initiative Project E) has - up till 2019 – conducted the following activities:

- Measured 23 countries using the Macro BIM Adoption Models;
- Delivered 10 national and regional reports covering Macro BIM Adoption assessments;
- Made 25 presentations were to policy makers across the world; and
- Coordinated the contributions of 400 subject matter experts,

This strategy builds upon this baseline and applies the following metrics to measure against project objectives:

OBJETIVES	METRICS	GOAL
<b>Becoming the top recognised international framework for analysing Macro BIM Adoption</b>	Countries to be assessed and benchmarked	50
	Number of institutions to be engaged to act as Country Affiliates (and sign a Collaboration Agreement)	150
	Studies per country over Project Duration (3 years)	3
	Data instances (number of completed surveys)	150
<b>Becoming an international reference for policymakers seeking advice about digital transformation</b>	Engage communities of policymakers (number of countries per year)	2
	Number of countries developing strategies and roadmaps based on the framework in next 3 years	3
	Consultancy services to policymakers in next 3 years	6
	Delivery of presentations of the Macro BIM Adoption Framework to policymakers	9
<b>Achieving academic leadership</b>	Academic publications in peer-reviewed journals	2
	Presentation in academic events	2
	Publication of project's annual report	3

## IV. Project Details

### A. Project Duration

The project is intended to run for **three years**. A Project Plan will need to be developed prior to the public announcement of the project (refer to section VIII). The Project Plan will include clearly defined milestones and preparatory actions.

## B. Project Team

Start-up team members: Mohamad Kassem, Danny Murguia, Eduardo Toledo Santos, Bilal Succar, and Cristiane Ramos Magalhães (start-up functions to be added).

## C. Background Research

The Macro BIM Adoption Project builds upon more than five years of background research and peer-reviewed publications (up till 2019). For a list of these publications, please refer to the Macro BIM Adoption [project page](#) on BIMexcellence.org. Additionally, the Macro Adoption Project examines existing guides and frameworks developed by policymakers and task groups (e.g. International Guide to UK BIM Programme, Handbook for the introduction of Building Information Modelling by the European Public Sector, etc.).

## D. Alignments with other BIME Initiative projects

The Macro BIM Adoption project is reliant on published conceptual models, studies completed, and assessment results analysed to date. It is one part of several interconnected efforts being conducted simultaneously by the [BIME Initiative](#). While this project's activities and outcomes are unique in scale and nature, they depend on, support, and complement other BIME Initiative Projects. The Macro BIM Adoption project:

- Is based on the foundational theories, frameworks, models, taxonomies, and classifications underlying the BIME Initiative (refer to [102in BIME Knowledge Structures](#)). Any new conceptual component needs to be tested against these foundations and cross-aligned. That is, to safeguard the internal consistency of conceptual foundations, new components must either be aligned with existing ones, or existing ones need to be carefully updated to align with new ones.
- Relies on the terms and descriptions available through the **BIM Dictionary** (BIME Initiative Project A) in multiple languages. Any new term developed for this project first needs to be tested against existing conceptual foundations (see the previous point), aligned with existing terms, and then incorporated into the Dictionary for further expansion and translation by different project teams.
- Is made publicly available through the **Knowledge Sharing** channels (BIME Initiative Project B). Project activities and outcomes are shared with the community and the public through posts/pages on BIMexcellence.org and BIMthinkSpace.com. New conceptual models, complementing or extending current conceptual Macro Adoption models, are shared through the BIMframework.info site. Also, and only if aligned with this project's mission, research methods and findings are submitted for peer-review in Class A journals and presented at selected industry/academic conferences. Project outputs are also selectively shared through industry publications and social media.
- Contributes to and benefits from the **Competence Project** (BIME Initiative Project C). The activities and abilities of decision-makers are derived from the BIME Competence Taxonomy (refer to [201in Competency Table](#)) and – if not available – developed using the BIME Method's syntactical rules and incorporated into the evolving Competency Inventory.
- Complements the assessment methods and templates generated as part of the **Performance Project** (BIME Initiative Project D). When assessing the macro maturity at market-scale, the project team will need to account for the overlaps with *micro* and *meso* [Organisational Scales](#). The language, methods, and tools developed for the Macro Adoption Project need to be applicable where the line separating these scales is faded (e.g. when assessing very large, international, and vertically integrated organisations).

## V. Microprojects

The Macro BIM Adoption is a **Top-Level BIME Initiative Project** and is further subdivided into smaller interdependent **Microprojects** (refer to [103in](#)). Microprojects are briefly summarised below:

### E1 Project Administration

This Microproject focuses on the development, management, and continuous review of project scope, resources, and activities. It includes the maintenance of the overall strategy, the development of protocols and collaboration agreements, conduction of outreach programmes to recruit project participants, and the continuous alignment of this project's methods and outcomes with other BIME Initiative projects. Microproject E1 also covers all activities intended to secure funding in the form of research grants, industry sponsorship, and other types of funding as guided by the BIME Initiative's General Principles and detailed within the [901in BIME Initiative Sponsorship](#) document.

### E2 Conceptual Components

The Microproject focuses on the development, adaptation and testing of new Macro Adoption frameworks, models, taxonomies, metrics, and their composite templates. Examples of these include new Key Adoption Indicators covering Macro Cultural Readiness, Macro Adoption Legacy, Macro BIM Collaborative Governance, and Cross- Market Influencers (for mimetic behaviour).

### E3 Macro Adoption Assessments

This Microproject focuses on preparing, conducting, and managing Macro Adoption Studies (e.g. [Ireland 2017](#)).

### E4 Macro Adoption Guide

This Microproject focuses on delivering an online resource to assist policy makers in developing, implementing, and/or improving their macro adoption policies and national initiatives. Microproject E4 delivers a Macro Adoption Guide composed, at least, of:

- Lessons learned from different countries
- Decision Support Templates
- Country Snapshots populated by country teams according to **Country Adoption Contribution**

**Template.** The Country Snapshots will include:

- Key Adoption Indicators
- Reference materials
- Raw assessment data if available (for other researchers to benefit from)

Researchers from academia and industry with experience in high-level policy formulations will be invited to: (1) participate in the development of Macro Adoption policy guides, tools and templates; and (2) help in verifying and or localising these guides, templates, and tools.

## E5 Macro Adoption Report

This Microproject delivers an annual report summarising the state of Macro BIM Adoption on the countries assessed worldwide.

## E6 Reference Library

Mapping useful Macro BIM Adoption resources and international Noteworthy Publications.

## E7 Macro Adoption Dashboard

This Microproject focuses on the development of an online interactive dashboard to display Macro BIM Adoption data for public engagement. The dashboard includes many functionalities allowing users to explore datasets, create custom views, export anonymised data, and print partial reports.

## E8 Academic Publications

This Microproject focuses on the dissemination of the knowledge generated or captured through blog posts, conference papers and journal articles.

## VI. Mapping Microprojects with Objectives

Microprojects need to satisfy one or more Strategic Objectives. The following table maps each Microproject against one or more Strategic Objectives:

CODE	MICROPROJECT	OBJECTIVES
<b>E1</b>	Project Administration	A, B, C, D
<b>E2</b>	Conceptual Components	A, B
<b>E3</b>	Macro Adoption Assessments	A, B, D
<b>E4</b>	Macro Adoption Guide	A, C
<b>E5</b>	Macro Adoption Report	A, B
<b>E6</b>	Reference Library	A, B, C
<b>E7</b>	Macro Adoption Dashboard	A, C
<b>E8</b>	Academic Publications	A

## VII. Preparatory Steps

To extend the Macro BIM Adoption project and fulfil its four objectives, a number of preparatory steps need to be completed:

### A. Updated Research Methodology

As part of developing the project strategy, the project team needs to review and update the Research Methodology. Subject to a more detailed review, the project will deploy:

#### A Simplified Taxonomy of Key Adoption Indicators

Macro Adoption can be investigated and assessed against numerous indicators and countless metrics – both current and new. As part of this project, the team will need to isolate the Key Adoption Indicators (KAI, pronounced K) and then develop the KAI Tools to capture, collate, and report on these indicators. KAI will be derived mostly from published research and completed studies and will attempt to simplify the conceptual models into macro [Competency Items](#) for assessment and performance improvement purposes.

#### Harmonised Survey Type

After trialing multiple survey designs, a simplified modular data collection approach will be adopted. Assessments will be conducted using a dedicated assessment solution - developed by ChangeAgents - and made available to the BIME Initiative. The new modular survey design will assess against Key Adoption Indicators and feed data into the Macro Adoption Dashboard.

The KAI will be split into three groups and assessed through **three complementary studies** to ensure reliability and validity. Each KAI group has targeted respondents and a dedicated data collection tool:

- **Macro Assessment - Policy Environment studies** will establish whether, when, and how policies are being enacted by policy makers to facilitate BIM adoption and digital transformation across a defined market. Data will be collected through by-invitation surveys and facilitated workshops. Participants in these studies will include government agencies and macro-policy influencers from industry and not-for-profit institutions.
- **Macro Assessment - Education Landscape studies** will establish the diffusion of digital transformation topics, collaborative educational practices, and relevant information management qualifications across educational institutions and programmes within a defined market. Data will be collected through by-invitation surveys conducted in collaboration with prominent local institutions.
- **Macro Assessment - Organizational Adoption studies** will establish the adoption of digital transformation tools, workflows, and protocols within organisations across a defined market. In collaboration with local partners (including not-for-profit and for-profit entities), data will be collected using open surveys targeted at a sample of small, medium, and large organisations across disciplines and specialties.

## Collection of Lessons Learned

There is a need to collect data in countries with more BIM experience to understand the diffusion process and their effect on actors such as: public servants, universities, technological institutes, consultants, contractors, etc. This would help the development of the Macro Adoption Guide as part of Microproject E5.

Lessons learned about the research process itself will be incorporated on the adopted methods, evolving the Macro BIM Adoption methodology.

## VIII. Project Plan

To achieve project objectives, a project plan has been developed and includes the following components:

### A. Master Plan

The project team will assign a Microproject Leader for each Microproject. The Microproject Leader could be part of the core project team or would be invited to participate according to the guidelines of the recruitment approach. The Microproject Leader should identify the key tasks and their interdependencies, resources, and deliverables for each work package. Therefore, the Microproject Leader will create a work programme consistent with the Project Master Plan. During execution, the Microproject Leader will validate that resources are available, tasks are constraint-free, and monitor the progress of each work package against the Project Master Plan. As part of the plan, the Microproject Leader will produce a meeting schedule with the Project Team to report progress, risks and discuss updates in the Microproject scope.

### B. Collaboration Model

The Macro Adoption Project has included ten detailed studies up to 2019. These studies were conducted in collaboration with **Knowledge Sharing Partners** (industry associations, universities, and policy makers) as part of a narrowly focused Collaboration Agreement. The project management team will review the current approach to engaging current and potential partners and develop a clearer, expanded and strategically focused **Collaboration Agreement Template**. These multi-year agreements will have a broader coverage and may include participation in other BIMe Initiative projects (e.g. the BIM Dictionary as a Country Editor/ Language Team member).

### C. Recruitment Approach

The success of the Macro Adoption Project is reliant on its strategy and the dedicated efforts of the project team. To build upon the successes achieved so far and extend project outputs, it is critical to recruit the right number/type of talent to work on each Microproject. In this respect, Competency Profiles will be defined first to reflect the requirements of each Microproject and *then* attempts will be made to identify the matching talent to invite into the corresponding project. The expansion of the project team and the inclusion of new matching talents – who share our General Principles – are core tenants of the project's strategy and need to be carefully pursued throughout the project's duration.

It is envisioned that each Microproject has a team with one leader and at least one member. It follows that the E4 Macro Adoption Studies microproject will have multiple country teams with **1 Country Team Leader** (individual with a network of policymakers, industry leaders, and academics in each country) and at least **1 Country Team Member** (researchers to contact participants, conduct the analysis and draft the reports). Each country team will be tasked with engaging an institution that can act as a Country Affiliate after signing Collaboration Agreement (refer to **611in.E** documents).

The recruitment approach includes the following components:

- Generating a profile for each microproject team and country representatives based on competencies;
- Developing the Microproject Team Guide and Country Team Guide. Make scope, activities, timelines, and deliverables clear (e.g. number of respondents per country, data collection efforts, data validation, data analysis, writing reports, liaise with policymakers, online meetings, etc.);
- Developing a web presence to attract these country representatives;
- Seeking nominations from current members of the network;
- Advertising vacant volunteering the positions on social media; and
- Conducting interviews with potential representatives.

## D. Funding Model

The project includes many activities and deliverables that do not require external funding. However, some Microprojects (e.g. E3-E5) can be greatly accelerated and expanded if adequate funding is secured. The project team needs to develop a clear Funding Model to enable such expansion and it may include:

- Applying for research grants
- Seeking project support in the form of BIME Sponsorship
- Providing paid advisory services to policy makers
- In-kind contributions by the BIME Community

The Funding Model must be aligned with the General Principles and any financial contributions must be targeted to a specific Microproject.

## E. Communication Plan

The plan will outline the communication strategy for public and policy-making engagement. This would include:

- Social media platforms to be used
- Content approach of social media (posts, shares, news, blogs, publications, videos, etc.)
- Management of online platforms
- Frequency of online presence
- Guidelines for advertising the positions of country representatives
- Guidelines for approaching policymakers
- Protocols for diffusing project deliverables
- Templates for typical messages and responses
- Metrics to capture public engagement



## IX. Extended Description processes

There are many processes to be defined, managed, integrated, and optimised throughout the project. This document introduces the *static version* of the general approach of the Main Project Flow and the Macro Assessment Flow.

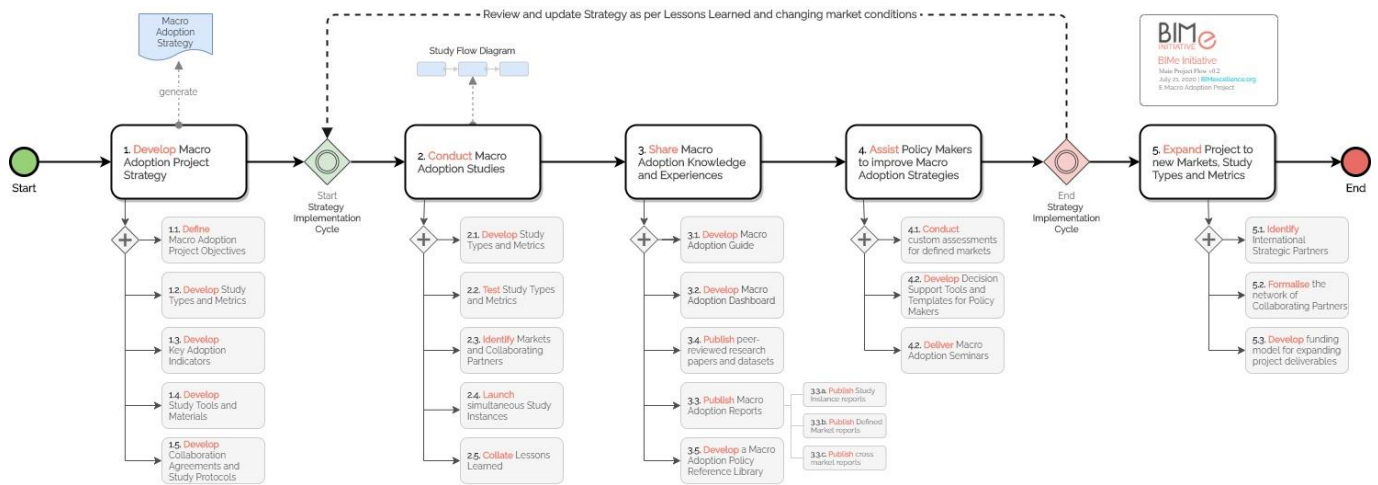


Figure 1 – Main Project Flow v0.2

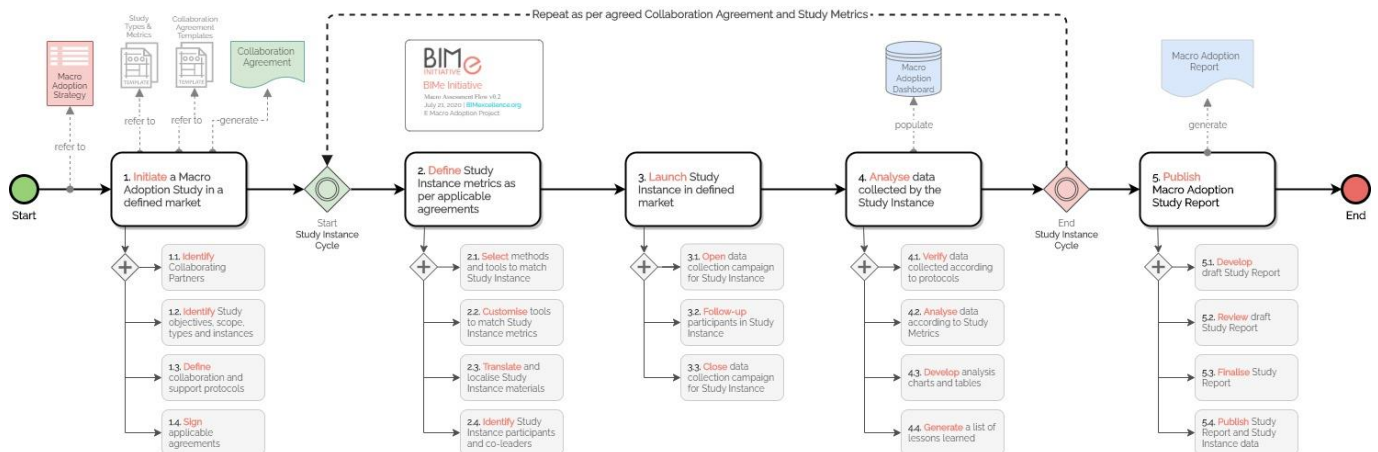


Figure 2 – Macro Assessment Flow v0.2

## X. Acknowledgements

This document was developed as a collaborative effort between Dr. [Bilal Succar](#), Director of *ChangeAgents AEC*, **Australia**; Dr. [Mohamad Kassem](#), Professor and Head of Construction Project Management at *Northumbria University*, **United Kingdom**; Dr. [Eduardo Toledo Santos](#), Assistant Professor at the Department of Building Construction of *Polytechnic School of the University of São Paulo*, **Brazil**; Mr. [Danny Murguia](#), Assistant Professor at the *Pontifical Catholic University of Peru*; and Ms. [Cristiane Ramos Magalhães](#), PhD Researcher at the *University Federal do Rio de Janeiro*, Brazil. Review was conducted by Dr. [Marzia Bolpagni](#) of MACE. **United Kingdom**.

## XI. More information

For more information about BIM Excellence Initiative and participation in the Macro Adoption Project E, please [Contact Us](#).

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## XIII. Change Log

VERSION	DATE	DESCRIPTION
0.6	Jul 14, 2020	Initial draft – for internal use and review
0.8	Aug 8, 2020	Community Version
1.0	Aug 22, 2020	1 <sup>st</sup> Public Version

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