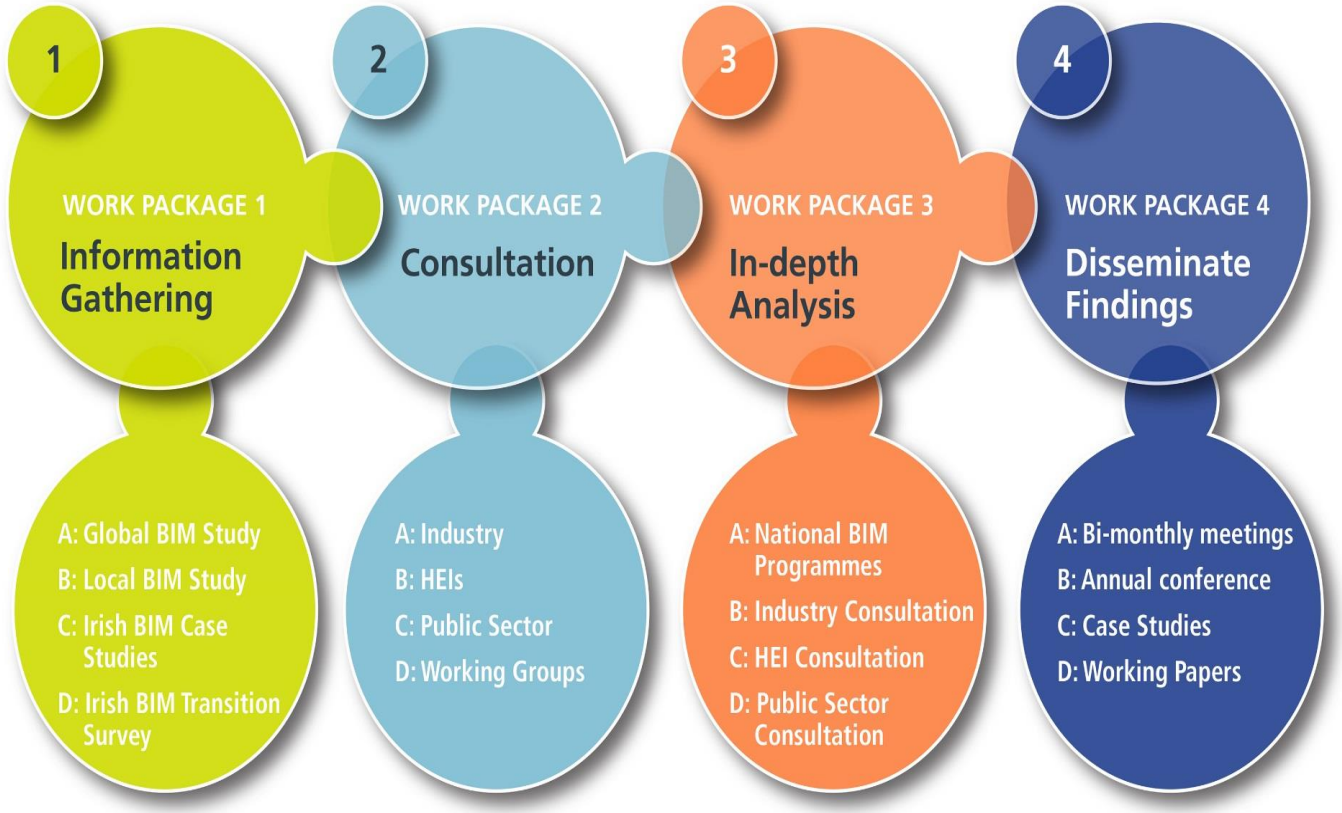
CitA
BIM GATHERING

Building Capabilities in Complex Environments

Ireland's BIM Macro Adoption Study: Establishing Ireland's BIM Maturity Study

Presented by Dr. Barry McAuley



Building Information Modelling | Innovation | Capability | Research Programme

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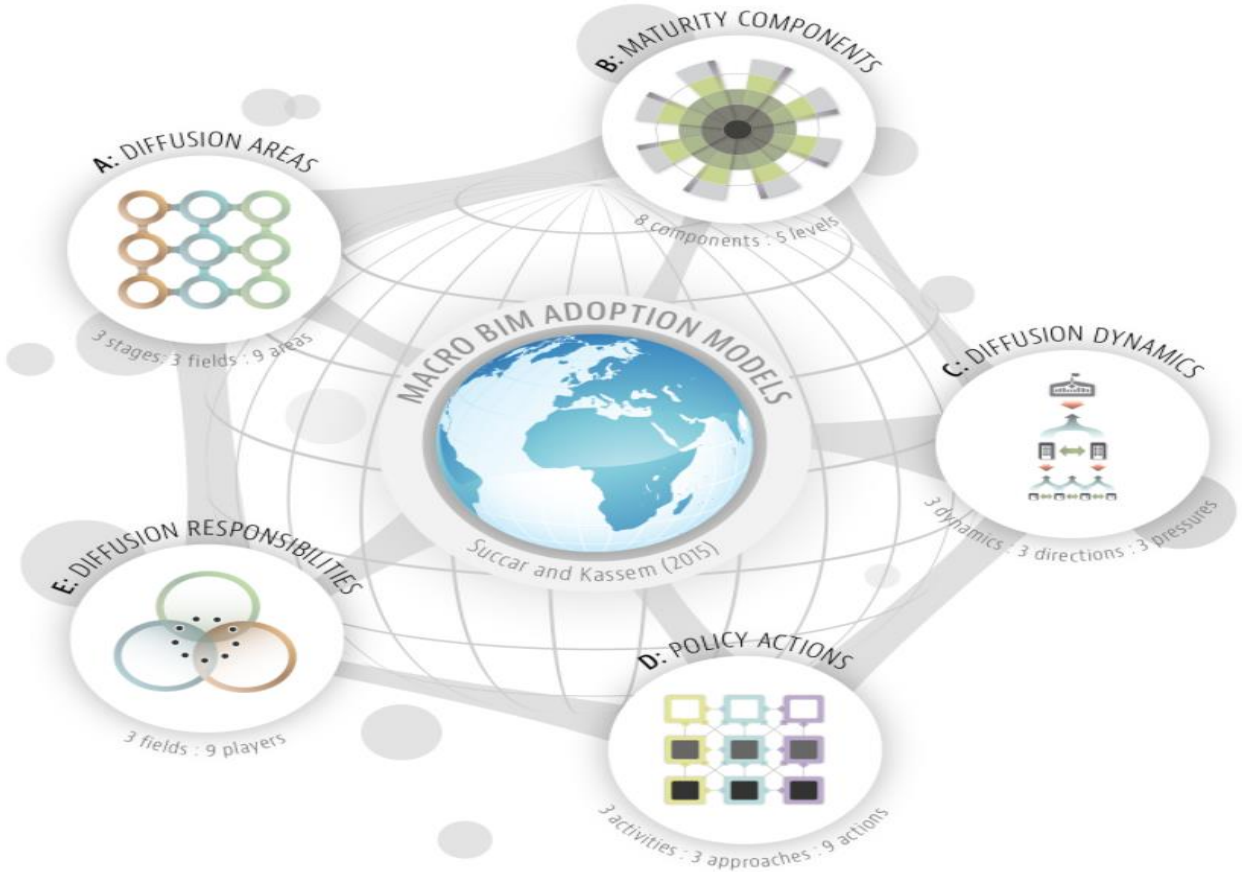
NBC NATIONAL BIM COUNCIL

CitA BIP CitA: BIM Innovation Capability Programme



- Assessing a country's current BIM adoption policy
- Comparing the BIM maturity of different countries
- Application of the models in developing a national BIM adoption policy

BIMe INITIATIVE

Principles & structures | Resources & publications | Projects & components | Members & volunteers | Sponsors & supporters | Search...

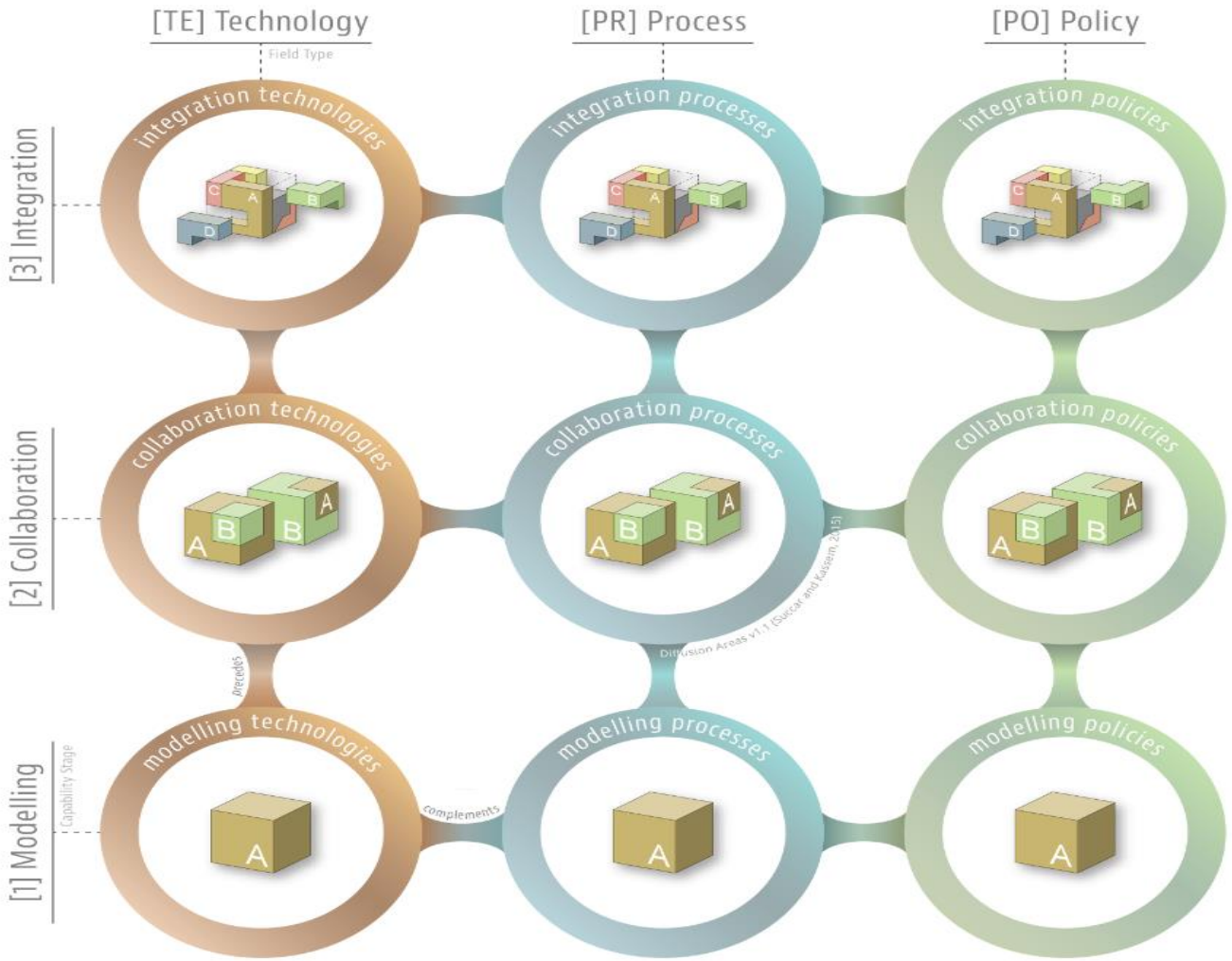
Latest Updates in Qatar page added. Pilot study launched as part of a funded QNRF project (c

Welcome to the BIMe Initiative!

A summary of the BIMe Initiative is available below in a number of languages.

The **BIMe Initiative** is a not-for-profit *knowledge generation and sharing* effort undertaken by volunteer researchers from both industry and academia. The BIMe Initiative provides a *community-based, research-driven alternative* to top-down, authority-led, and prescriptive BIM diffusion policies. Supported by clear knowledge structures, a network of international subject matter experts, and an expanding modular language, the BIMe Initiative delivers an innovative, coherent and timely response to the opportunities and challenges brought-forward by BIM adoption at all organisational scales.

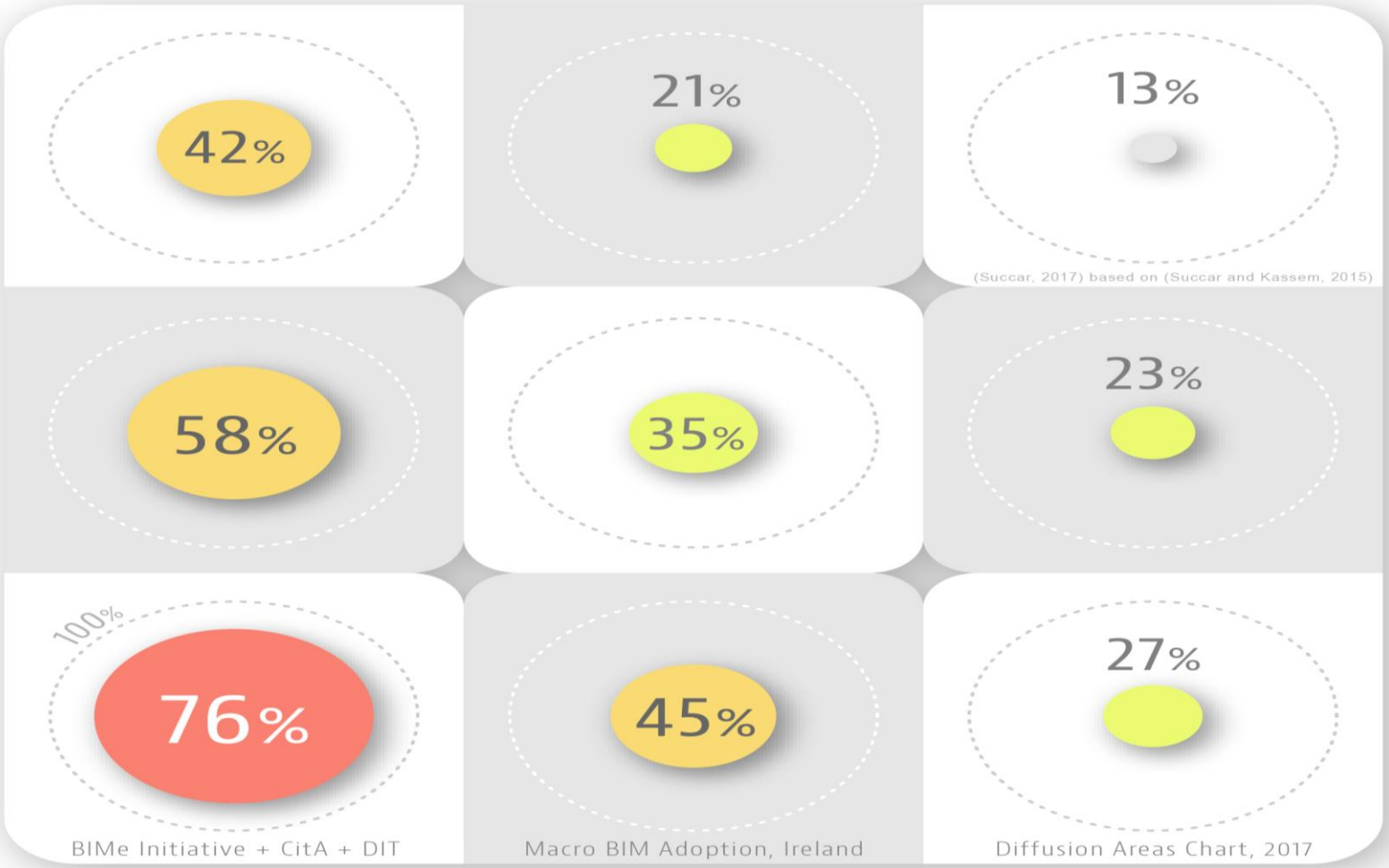
http://bimexcellence.org/



This model seeks to establish the extent of BIM diffusion across markets

Cumulative Capability Increase →

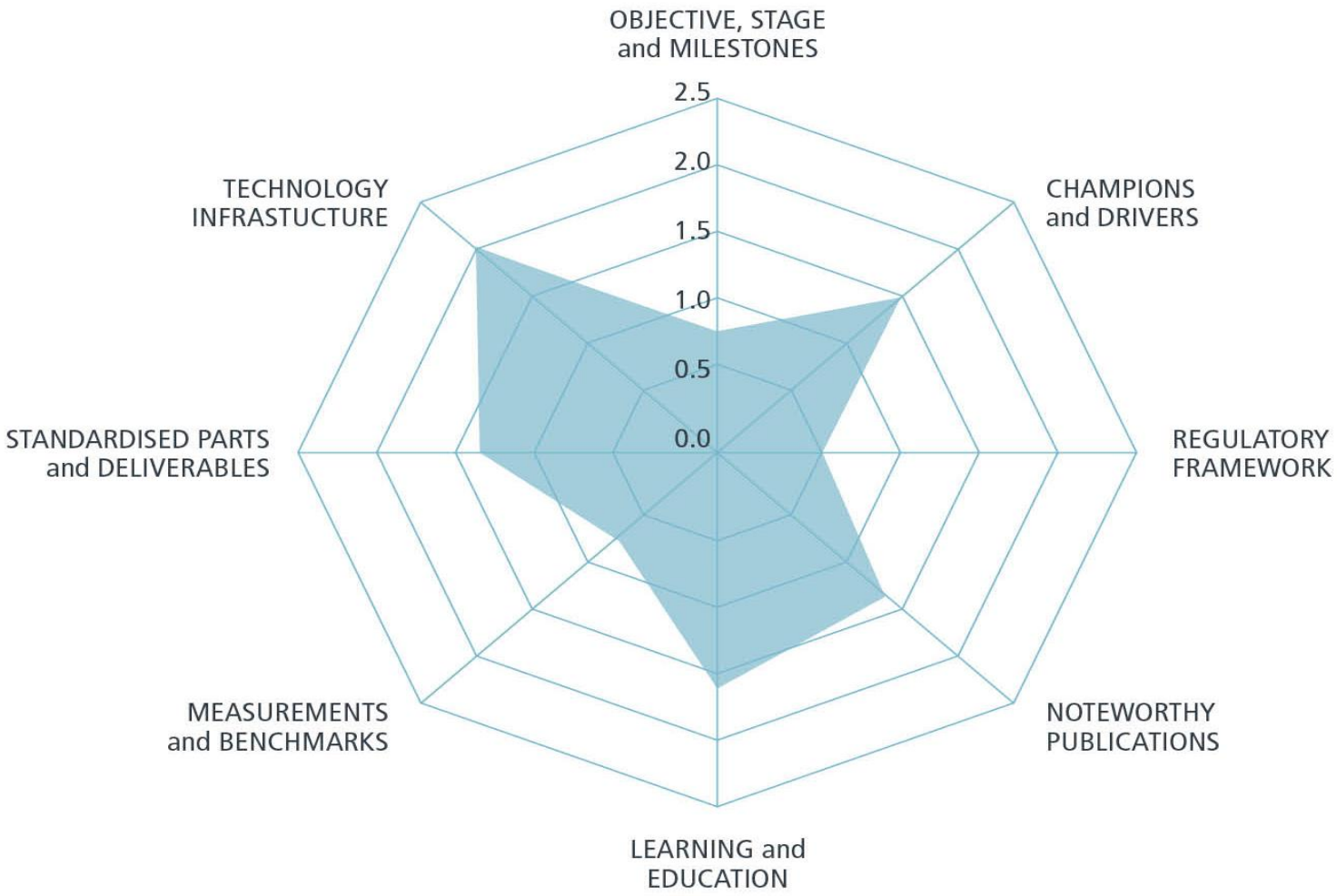
INTEGRATION	**3TE**: Integration Technologies Rate of adoption of *network-based* interchange solutions (e.g. model servers); the proliferation of real-time network-based integration across disparate systems	**3PR**: Integration Processes Rate of adoption of *integrated supply-chain* processes across the whole supply chain; the proliferation of interdisciplinary workflows across all project life cycle phases	**3PO**: Integration Policies Rate of adoption of *integrated supply-chain* standards, protocols and contractual agreements; the proliferation of interdisciplinary educational programmes
COLLABORATION	**2TE**: Collaboration Technologies Rate of *inter-organizational* adoption of model-sharing software and middleware tools (e.g. Navisworks, Vico and Ecodomus)	**2PR**: Collaboration Processes Rate of *inter-organizational* adoption of project BIM roles (e.g. Information Manager); the proliferation of multidisciplinary model-based workflows	**2PO**: Collaboration Policies Rate of *inter-organizational* adoption of modelling standards and collaboration protocols; the proliferation of collaboration-centric contractual agreements and educational programmes
MODELLING	**1TE**: Modelling Technologies Rate of *intra-organizational* adoption of BIM software tools (e.g. Revit and Tekla) and their underlying hardware and network requirements	**1PR**: Modelling Processes Rate of *intra-organizational* BIM roles (e.g. model manager, and BIM trainer) and model-based workflows	**1PO**: Modelling Policies Rate of *intra-organizational* adoption of modelling standards (e.g. naming standards, shared parameters, level of details, and property sets) and file exchange protocols

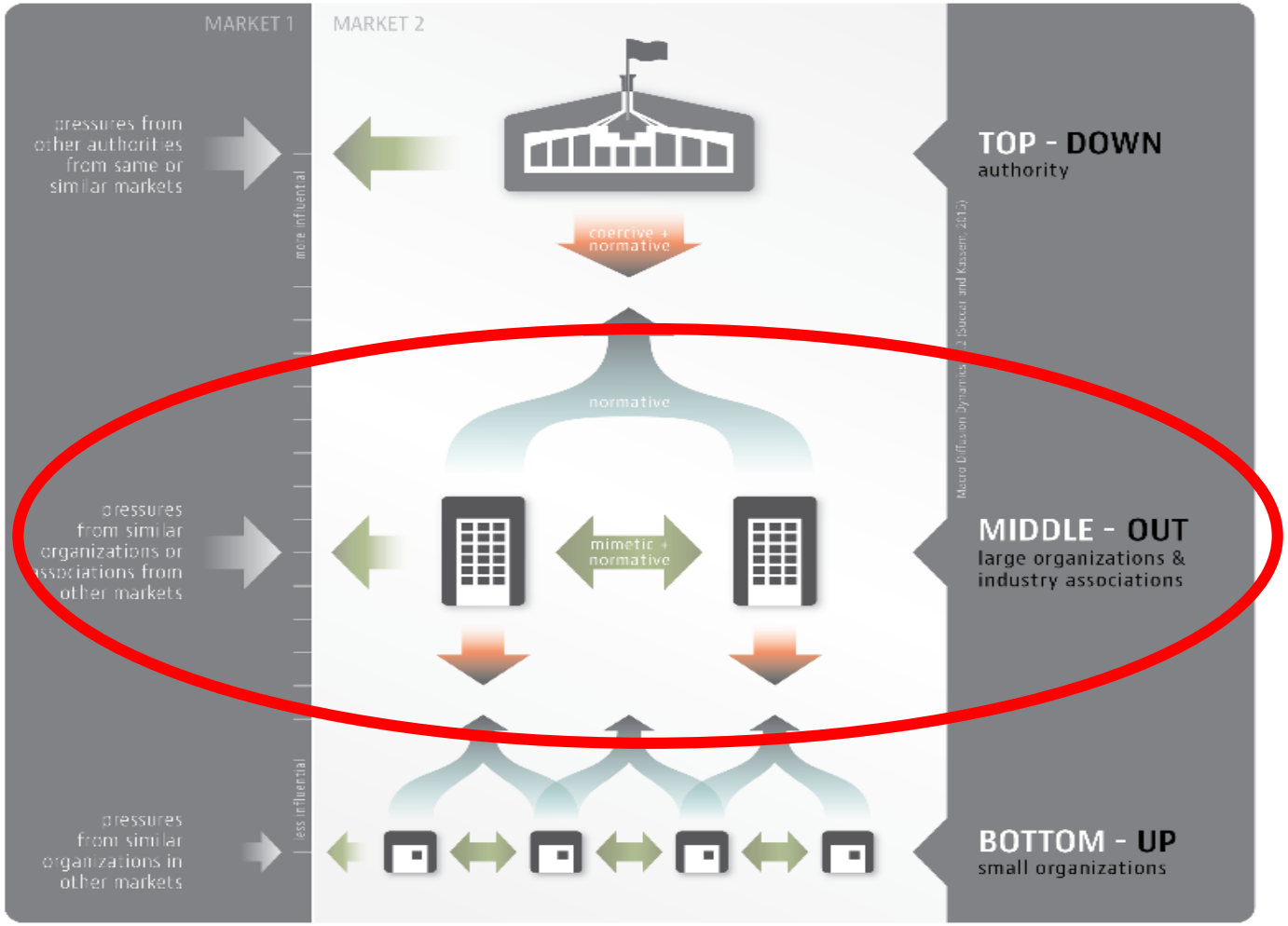

42%
21%
13%
(Succar, 2017) based on (Succar and Kassem, 2015)
58%
35%
23%
100%
76%
45%
27%
BIMe Initiative + CitA + DIT
Macro BIM Adoption, Ireland
Diffusion Areas Chart, 2017

This model assesses the BIM maturity of countries using a comparative matrix or granularity using component-specific metrics

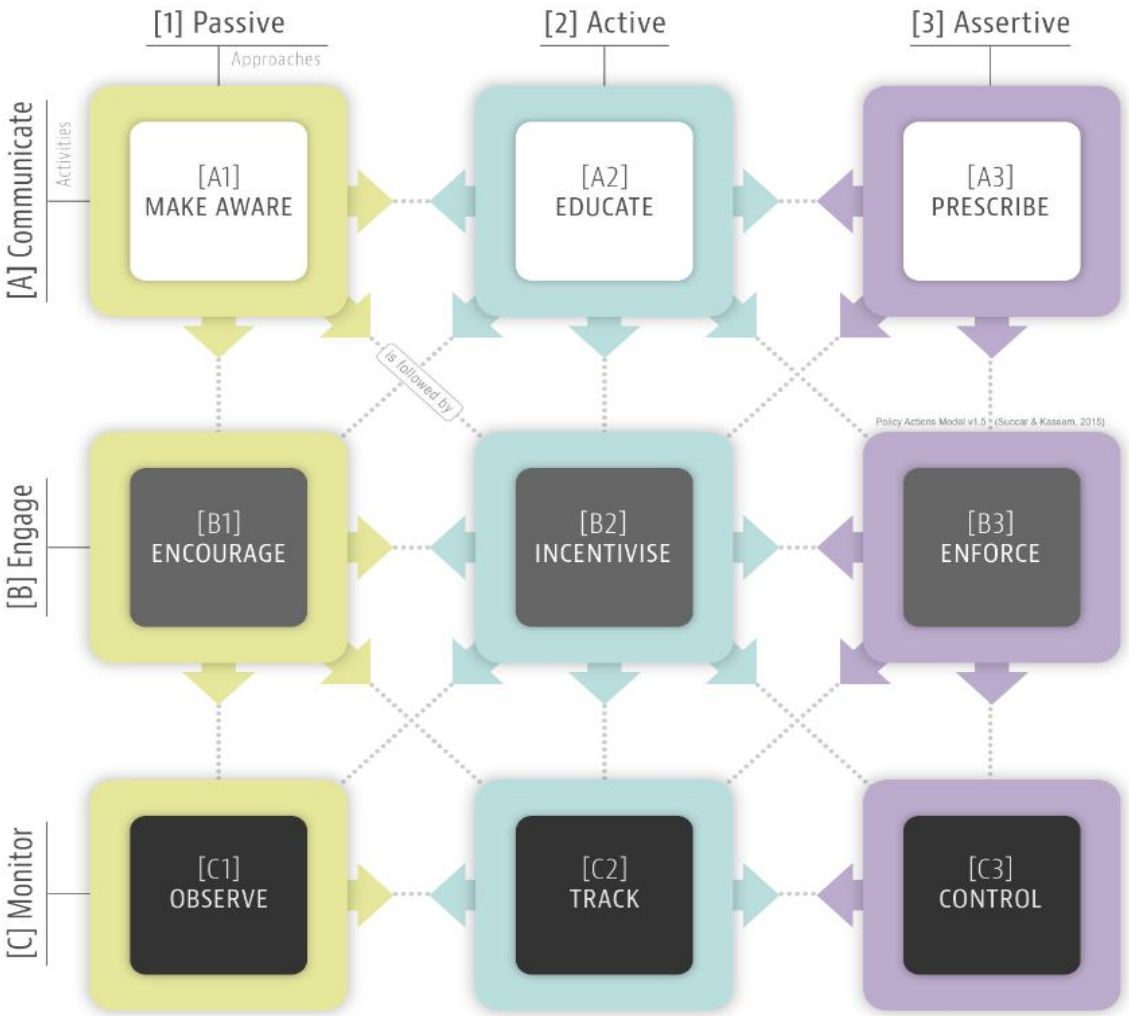
a *(low)*	**b** *(medium-low)*	**c** *(medium)*	**d** *(medium-high)*	**e** *(high)*
There are no capability stages separating *lack of ability* from heightened proficiency	Capability stages are defined yet lack internal consistency or well-defined boundaries (overlap with each other)	Capability stages are well-defined and consistent yet are not integrated with objectives and milestones	Capability stages are integrated with objectives and milestones	Capability stages are dynamically optimised in response to changes in other macro maturity components

Other granular metrics include: *The Availability of Long-term Objectives to Guide Market Adoption; The Availability of Maturity Milestones to Guide Market Adoption; …*


OBJECTIVE, STAGE and MILESTONES
2.5
2.0
1.5
1.0
0.5
0.0
CHAMPIONS and DRIVERS
REGULATORY FRAMEWORK
NOTEWORTHY PUBLICATIONS
LEARNING and EDUCATION
MEASUREMENTS and BENCHMARKS
STANDARDISED PARTS and DELIVERABLES
TECHNOLOGY INFRASTUCTURE

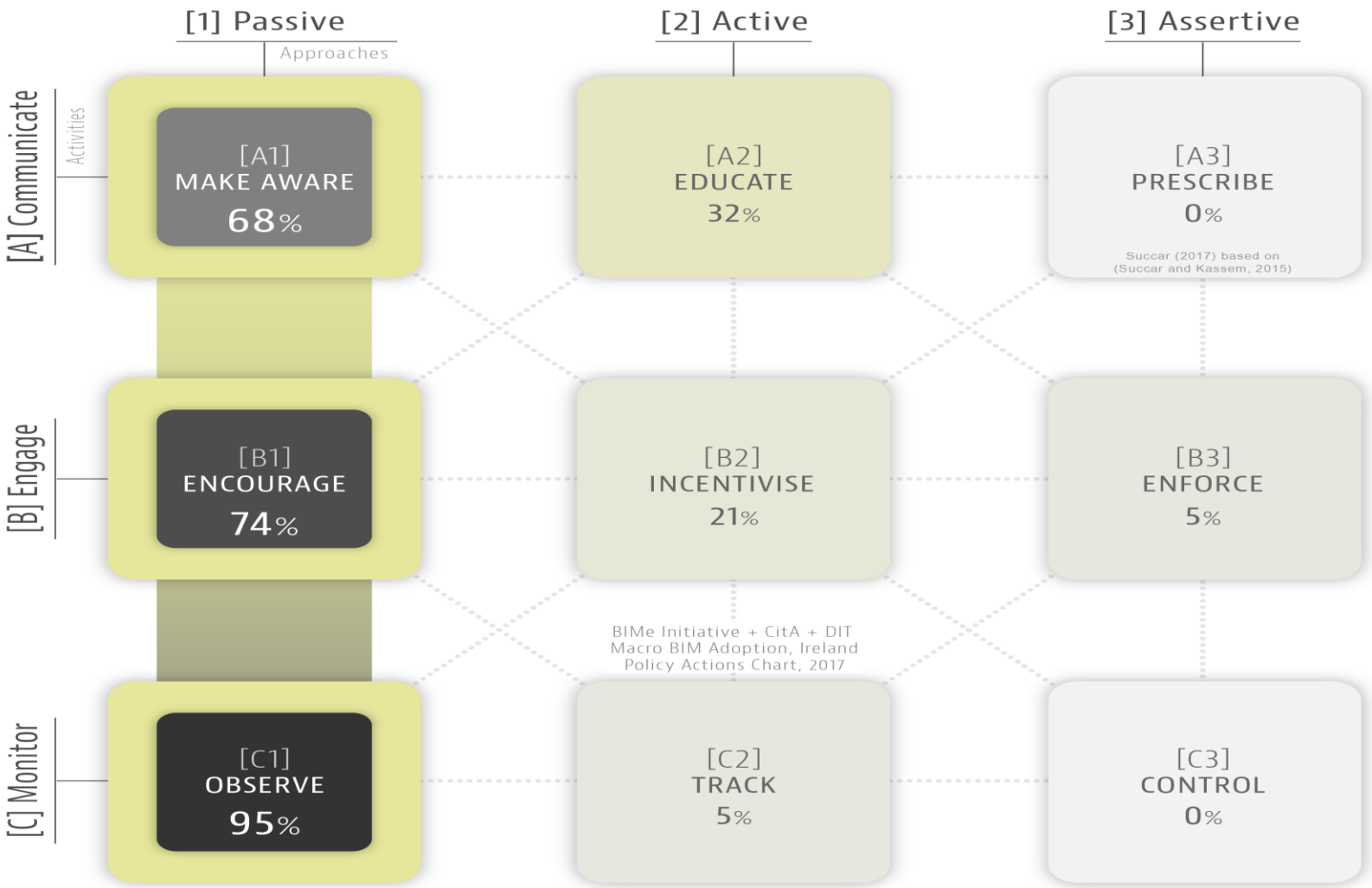


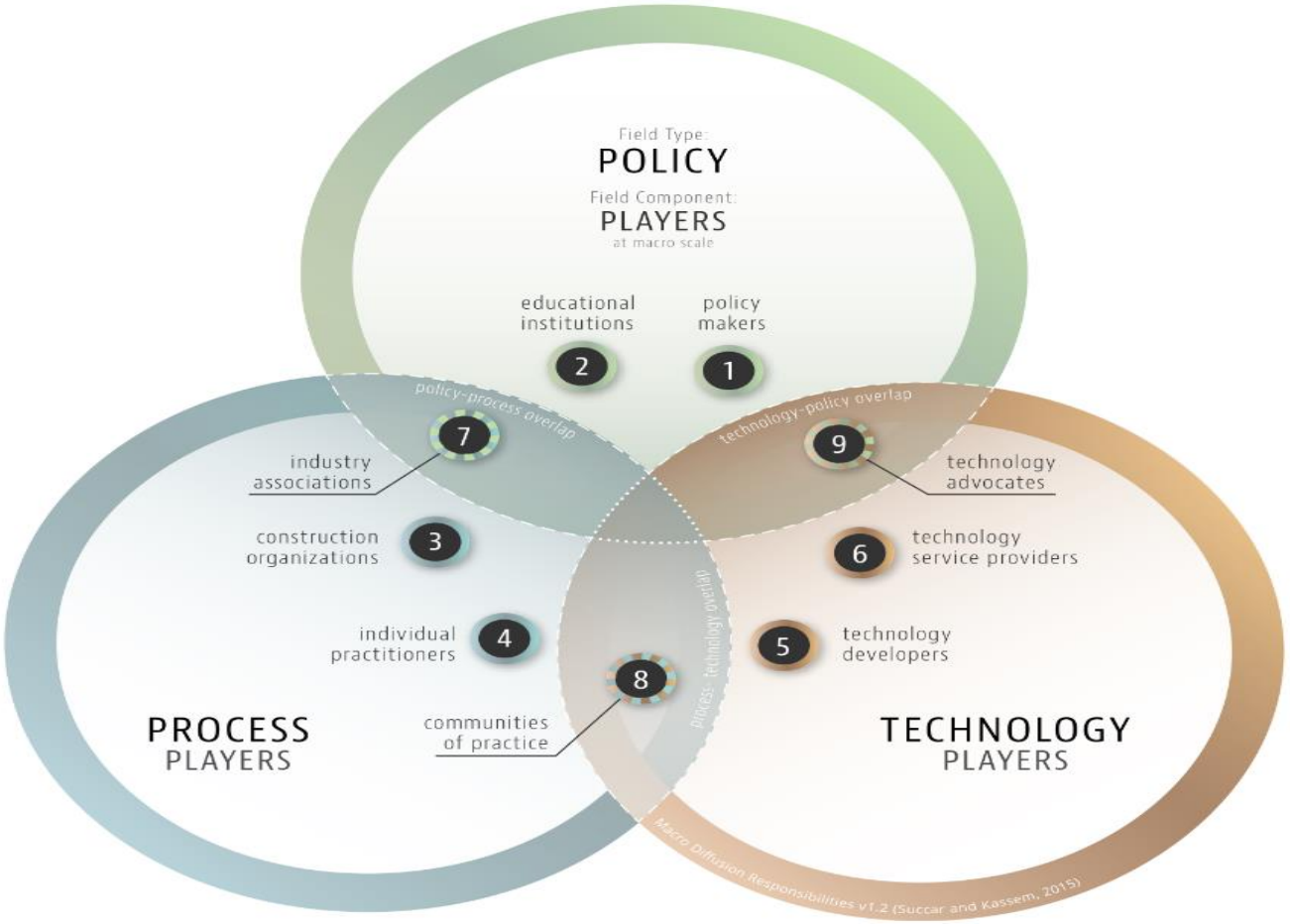
This model assesses and compares the directional pressures and mechanisms affecting how diffusion unfolds within a population



This model identifies, assesses and compare the actions policy makers take (or can take) to facilitate market-wide adoption

ACTIVITIES	[1] PASSIVE	[2] ACTIVE	[3] ASSERTIVE
[A] COMMUNICATE	**Make aware**: the policy player informs stakeholders of the importance, benefits and challenges of a system/process through formal and informal communications	**Educate**: the policy player generates informative guides to educate stakeholders of the specific deliverables, requirements and workflows of the system/process	**Prescribe**: the policy player details the exact system/process to be adopted by stakeholders
[B] ENGAGE	**Encourage**: the policy player conducts workshops and networking events to encourage stakeholders to adopt the system/process	**Incentivise**: the policy player provides rewards, financial incentives and preferential treatment to stakeholders adopting the system/process	**Enforce**: the policy player includes (favours) or excludes (penalises) stakeholders based on their respective adoption of the system/process
[C] MONITOR	**Observe**: the policy player observes as (or if) stakeholders have adopted the system/process	**Track**: the policy player surveys, tracks and scrutinizes how/if the system/process is adopted by stakeholders	**Control**: the policy player establishes financial triggers, compliance gates and mandatory standards for the prescribed system/process


[1] Passive
Approaches
[2] Active
[3] Assertive
[A] Communicate
Activities
[A1] MAKE AWARE 68%
[A2] EDUCATE 32%
[A3] PRESCRIBE 0%
Succar (2017) based on (Succar and Kassem, 2015)
[B] Engage
[B1] ENCOURAGE 74%
[B2] INCENTIVISE 21%
[B3] ENFORCE 5%
BIMe Initiative + CitA + DIT Macro BIM Adoption, Ireland Policy Actions Chart, 2017
[C] Monitor
[C1] OBSERVE 95%
[C2] TRACK 5%
[C3] CONTROL 0%



This model assesses and compares the roles played by different stakeholder groups in facilitating diffusion within and across markets.

POLICY FIELD

1 Authorities

Governmental players undertaking an active role in mandating or encouraging the adoption of BIM tools and workflows

e.g. the BIM Task Group in the UK and BCA in Singapore

2 Educational institutions

The universities and not-for-profit technical institutions developing and delivering learning programs and materials

PROCESS FIELD

3 Construction organizations

Designers, contractors, owners, operators and other organizational players involved in deploying BIM tools and workflows, training their staff and delivering BIM-enabled outcomes

4 Individuals

The individual practitioner, researcher, lecturer and student involved in learning, or actively implementing BIM tools and workflows

TECHNOLOGY FIELD

5 Software developers

The large software houses responsible for developing and maintaining BIM software tools, network solutions and middleware

e.g. Autodesk, Nemetschek and Trimble

6 Value-adding resellers

The companies bridging and maintaining the relationship between software/network solution developers and end users

POLICY-PROCESS OVERLAP

7 Industry associations

Associations dedicated to representing the interests of their individual and organizational members

e.g. AMCA in Australia

PROCESS-TECHNOLOGY OVERLAP

8 Communities of practice

The informal grouping of individuals with a shared interest in improving their own BIM performance

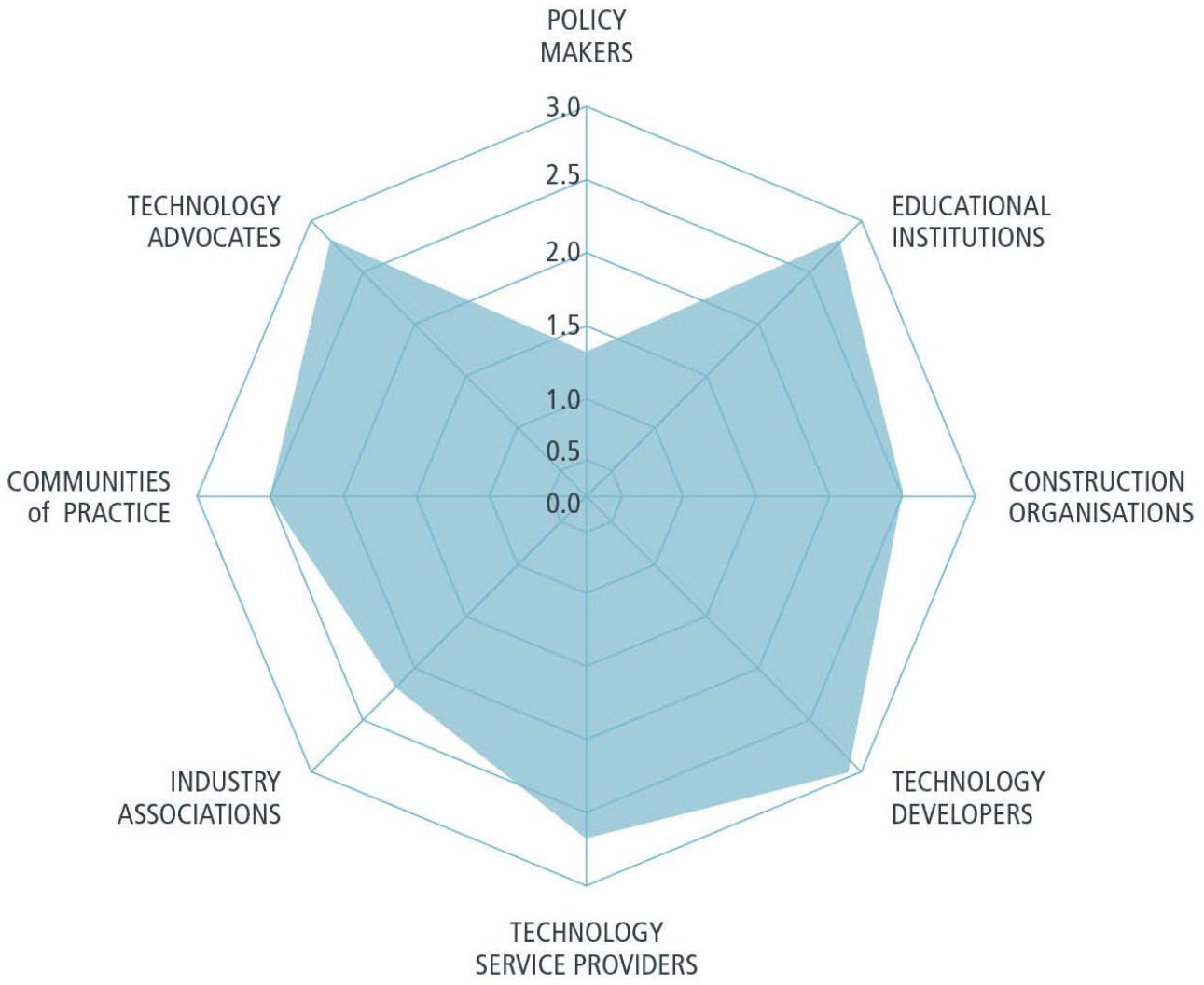
e.g. Revit user groups

POLICY-TECHNOLOGY OVERLAP

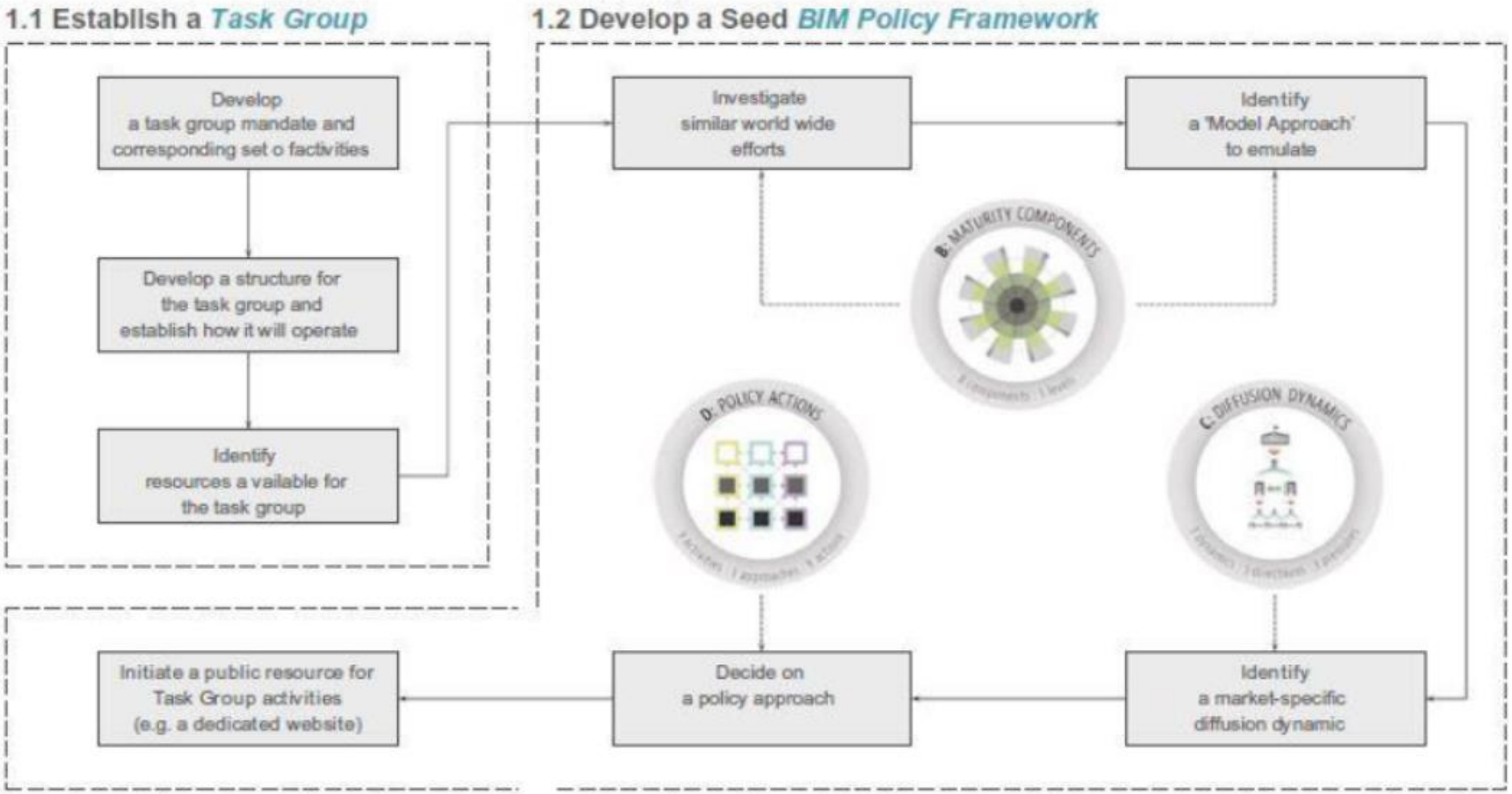
9 Technology advocates

The associations involved in developing and promoting technology-centric solutions for industry challenges

e.g. buildingSMART


POLICY MAKERS
EDUCATIONAL INSTITUTIONS
CONSTRUCTION ORGANISATIONS
TECHNOLOGY DEVELOPERS
TECHNOLOGY SERVICE PROVIDERS
INDUSTRY ASSOCIATIONS
COMMUNITIES of PRACTICE
TECHNOLOGY ADVOCATES
3.0
2.5
2.0
1.5
1.0
0.5
0.0

Contents



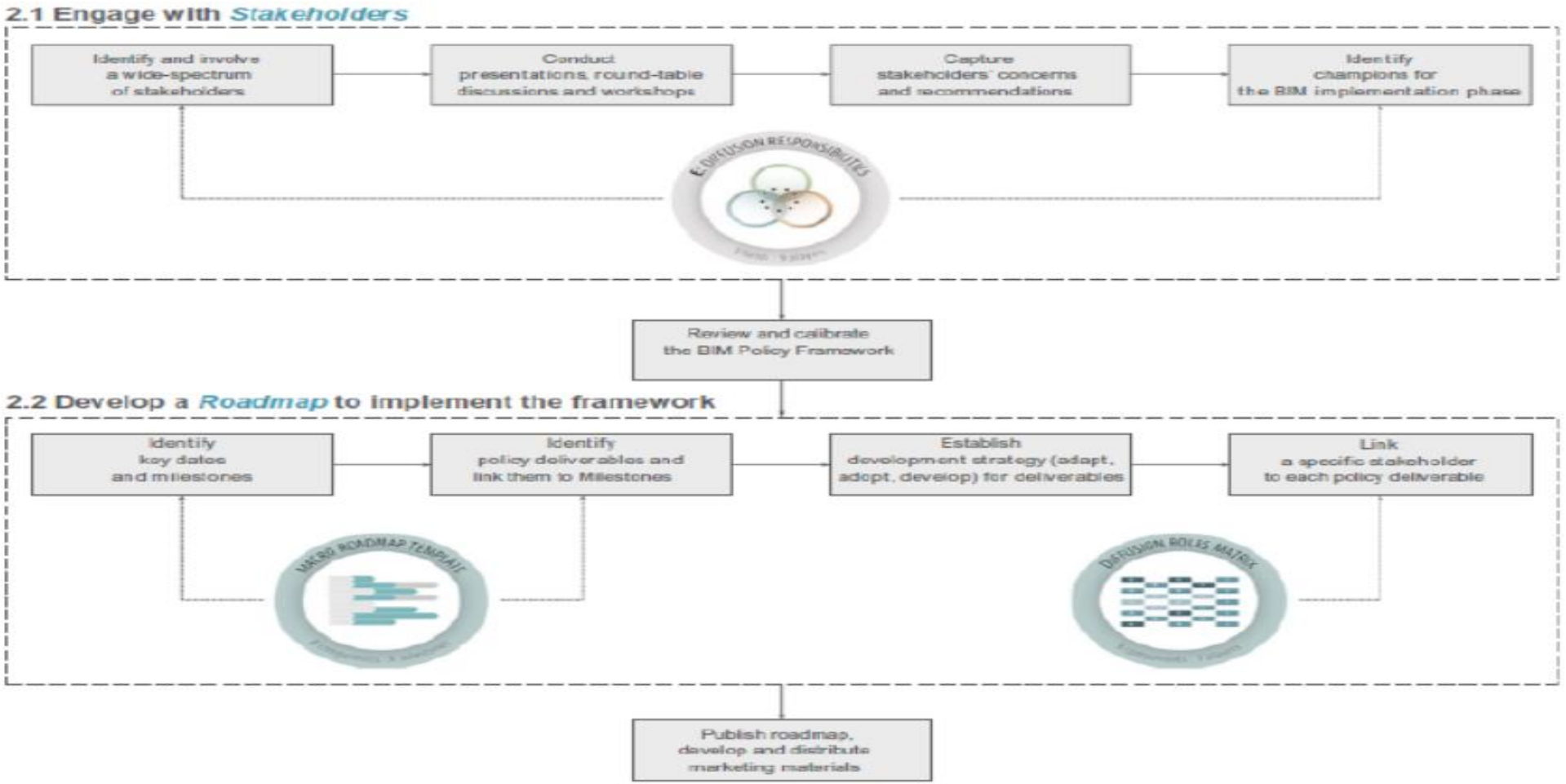
The Initiation Phase of the Policy Development Plan (Source Succar and Kassem, 2017).

ESTABLISH A TASK GROUP:
This involves developing a task group mandate and corresponding set of objectives. The NBC in partnership with the BICP research team have operated within a similar remit in Ireland. The goal of the task group is to develop a seed BIM policy framework .

DEVELOP A SEED BIM POLICY FRAMEWORK
Stage 1 & 2 of developing this framework involves a) investigating similar worldwide efforts and b) identifying a model approach to emulate.

Stage 3 involves the application of the diffusion dynamics model to identify a market specific diffusion dynamic. This, as seen from the results, is predominately middle out. This in turn will influence **Stage 4** which is the policy approach. The policy approach, as seen from model D, is largely passive which will put further pressure on the proposed BIM framework to be led by the larger contractors.

The Final Stage in the initiation phase is to have a public resource for task group activities. At present a number of portals exist which provide valuable information for the Irish AEC Sector. The BICP website could serve as the primary portal for the task group with an additional partnering website such as NBCIreland.ie, CitA.ie, BIMIreland.ie and BIMregions and all offering valuable resources.


2.1 Engage with Stakeholders
Identify and involve a wide-spectrum of stakeholders
Conduct presentations, round-table discussions and workshops
Capture stakeholders' concerns and recommendations
Identify champions for the BIM implementation phase
Review and calibrate the BIM Policy Framework
2.2 Develop a Roadmap to implement the framework
Identify key dates and milestones
Identify policy deliverables and link them to Milestones
Establish development strategy (adapt, adopt, develop) for deliverables
Link a specific stakeholder to each policy deliverable
Publish roadmap, develop and distribute marketing materials

ENGAGE WITH STAKEHOLDERS

The first stage involves identifying and engaging with a wide-spectrum of stakeholders and conducting presentations, round-table discussions and workshops. The diffusion responsibility model has enabled one to identify the areas where Ireland is weak and may require extended consultations to ensure adequate resources are provided for the identified nine BIM players.

DEVELOP A ROADMAP TO IMPLEMENT THE FRAMEWORK

Once the engagement with stakeholders period is complete, a roadmap to implement the framework can be designed with key dates and milestones designated and linked to policy deliverables through a Macro Roadmap Template. This template consists of the nine BIM policy areas from Model E aligned to deliverables and timeframes within each area.

The next stage of the roadmap involves the development of a strategy for deliverables. This is linked through assigning a specific stakeholder to each policy deliverable as a result of the diffusion roles matrix.

	2017	2018	2019	2020	20xx
Objectives, Stages & Milestones	Establish basic strategic objectives	Define min capability requirements for projects of Type X	Define minimum capability requirements and project deliverables for all other types and sizes of projects		
Champions & Drivers	Establish a high-level task group to develop a national strategy	Establish mid-level, regional or specialised satellite task groups to implement the national strategy and develop detailed protocols	Dissolve all regional satellite groups and encourage the formation of specialised Communities of Practice (CoP)s		
Regulatory Framework	Develop a framework that encourages process innovation, early involvement of contractors and integrated project delivery	Conduct pilot projects using the new framework. Refine the framework and establish a strategy for its market-wide adoption	Mandate the use of the new regulatory framework		
Noteworthy Publications	Establish a list of noteworthy publications to be developed	Develop the development of the first set of guides, protocols and mandates that facilitate BIM adoption across the market	Develop or coordinate the development of a set of standards that regulate the quality of project deliverables across the supply chain		
Learning & Education	Develop a competency inventory, educational framework, and learning modules. Conduct awareness sessions across the supply chain	Develop learning modules for tertiary, vocational, and professional settings. Encourage the development of e-learning material covering all disciplines and roles. Educate the educators.			
Measurements & Benchmarks	Develop metrics for assessing and prequalifying the capability of organizations and the competency of individuals	Develop a market-wide benchmark for project performance. Develop a performance pre-qualification framework	Establish a market pre-qualification register		
Standardised Parts & Deliverables	Develop a protocol for standardized components	Generate standardized components for most-used architectural, structural and mechanical elements.			
Technology Infrastructure	Develop a protocol for min hardware specifications	Develop a protocol for common data environments (for exchanging files and data)	Develop a protocol for a whole life-cycle, *integrated-data environment* (covering all documents, models and data)		

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Macro Maturity Components

Diffusion-Role Matrix v1.0 *sample shown at GLevel 1* (Succar, 2015)

Macro Player Groups	Objectives, Stages and...	Champions & Drivers	Regulatory Framework	Noteworthy Publications	Learning & Education	Measurements & Benchmarks	Standardised Parts and...	Technology Infrastructure
Policy Makers	A	A	A	B	B	A	B	C
Educational Institutions	B	B	A	A	A	B	C	C
Construction Organizations	B	A	B	B	B	A	A	B
Individual Practitioners	C	C	C	C	A	C	C	C
Technology Developers	C	C	C	C	B	C	B	A
Technology Service Providers	C	C	C	B	A	C	B	A
Industry Associations	B	B	A	A	B	A	C	C
Communities of Practice	C	B	C	B	B	C	A	C
Technology Advocates	A	A	B	A	B	B	A	B

[A] Leading, [B] Supporting, & [C] Participating roles

Table 3. A template for assessment and planning of diffusion roles (Source Succar and Kassem, 2017).

Matching the macro maturity components to the nine BIM players through assigning them to:

A. Leading Role played by those responsible for initiating, developing and maintaining a structured diffusion effort
B. A supporting Role played by those assisting the Leading Role to communicate and engage with other players, and in delivering diffusion components; and
C. CA participating Role played by early adopters of innovative systems/processes.

EXECUTION PHASE

The initiation of a Pilot Programme which will require the development of Employer Information Requirements, a training programme for public procurers and support system for industry groups around the BIM policy framework.

While potential roadmaps are being discussed for both the private and public sectors, there is still a gap in the execution and monitoring of these roadmaps.

The BICP research team, which has been fundamental in providing research for the Irish AEC sector, could potentially assist with facilitating the key deliverables of the execution phase.

If the correct resources are not provided at this stage then the roadmap could falter and be met with strong objections from the industry.

The BICP research team could work in tandem with the NBC and the GCCC to provide the important research resources required for the roadmaps.

The BICP has provided an effective resource in addressing the key stages in both the initiation and consultation phase of the roadmap.

A proposed roadmap from the NBC will reflect these findings through a series of recommendations based on BICP findings.

However, the execution phase remains uncertain and will require significant resources to ensure its success.

With the BICP's contribution to date, it could be a seamless integration for the programme to become the monitoring body for the execution phase.

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Thank you