An Integrative Approach to Developing Organisational Capabilities and Individual Skills

A collaboration between
IVI, SFIA Foundation, and BCS, The Chartered Institute for IT
using the IT-CMF, SFIA, and SFIA*plus*

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Introduction

The tightly coupled relationship between organisational capability and the skills and competences of the individuals working in that organisation has long been recognised in both the academic literature and by the practitioner community. Simply improving individuals' skills and hoping that the organisation's capability automatically improves in tandem is not sufficient, however. This relationship is non-trivial and needs to be actively managed, meaning that people need to have shared goals and not just fragmented learning (Kim, 1993).

Prior knowledge and skills at the individual and collective level form the basis for developing capabilities in an organisation (Nieves & Haller, 2014). An organisation's capabilities, therefore, lie primarily in the organising principles by which individuals' and functional expertise is structured, coordinated, and communicated (Zander & Kogut, 1995). This requires deliberate intervention by the organisation's management to enable or drive individual learning to improve organisational capabilities and therefore organisational performance (Vargas, Lloria, & Roig-Dobón, 2016). This brings our focus to organisational learning, which is defined as "increasing an organization's capacity to take effective action" (Kim, 1993, p. 43), rather than perpetuating a fragmented learning approach.

Feedback from users of the Innovation Value Institute's (IVI) *IT-Capability Maturity Framework* (IT-CMF) has indicated that while the capability improvement tools provide a roadmap of what needs to be done, there is a gap in terms of how to go about enabling that. Similarly, users of the *Skills Framework for the Information Age* (SFIA) indicate that it is useful for identifying skills gaps and training requirements, but is less helpful at demonstrating how the organisation has improved following a skills-based intervention. Stakeholders involved with EU initiatives around the development of an ICT Profession have also confirmed the importance of the relationship between individual skills and organisational capability. The lack of a unified approach to this issue of organisational learning that they identify further corroborates the difficulties in simultaneously addressing organisational capability and individual skills development,

Based on this recognised need to address individual skills and organisational capability development in a holistic way, the IVI and the SFIA Foundation have been collaborating to link the capability improving IT-CMF with the skills improving SFIA framework. This was achieved through further collaboration with the British Computer Society (BCS, the Chartered Institute for IT), using their SFIA***plus*** Work Activities as the mechanism through which SFIA and IT-CMF could be connected at a comparable level of alignment between Skills and Capabilities.

We are indebted to both Ian Seward (SFIA Foundation) and Robert Streeter (BCS) for their practical guidance and advice, for sharing their expertise and insight, and for their continuing support and championing of this project.

Structure of Frameworks

This section offers a brief overview of the structure of the IVI's IT-Capability Maturity Framework (IT-CMF), the Skills Framework for the Information Age (SFIA), and the additional components offered by the BCS SFIA***plus*** product.

IT-CMF

The IT-CMF is designed around addressing IT Management needs from the perspective of organisational capability. Each of the 36 capability areas address a specific domain of IT management or operations across four broad groupings, or 'macro-capabilities'.

Each Critical Capability (CC) is made up of a set of Capability Building Blocks (CBBs), which describe what organisations should be able to do in a particular domain to manage this aspect of IT.

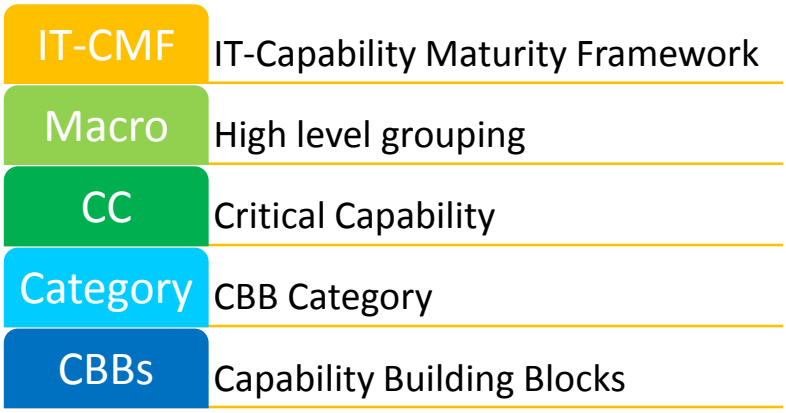

Figure 1: Structure of the IT-CMF

Further levels of detail describe how each of these aspects might manifest in organisations depending on their maturity in this area. The full list of IT-CMF critical capabilities is outlined in Appendix 1.

SFIA

The SFIA framework is designed around identifying and addressing the skills required to manage and operationalise IT from the perspective of the individual and the organisation.

Within SFIA, there are 97 individual Skills areas, grouped into 6 main categories, across 17 sub-categories. The full list of SFIA Skills is outlined in Appendix 2.

These Skills are further described at different Levels, from lowest (1) to highest (7), which correspond to the individual's degree of autonomy and influence in the organisation, the complexity of their work, and their level of specialised business skills (see Figure 2).

Level-specific Skill descriptions offer further details of how the skill would be expected to be addressed, depending upon the individual's level of operation within the organisation. Not every Skill is represented at all Levels – for example, more operationally concerned Skills are addressed at Levels 1-5, while strategically oriented Skills are only relevant at Levels 5-7.

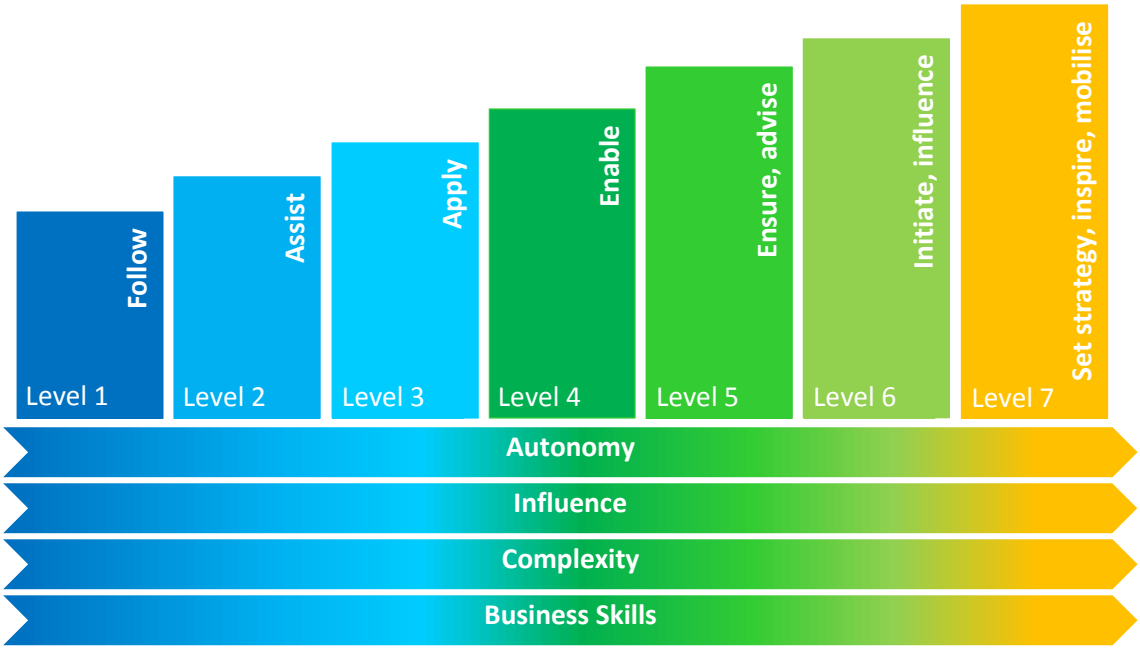

Figure 2: SFIA Levels

The SFIA framework is available under license directly from the SFIA Foundation website[1]. For many users, particularly individuals or organisations that wish to use SFIA internally as a reference tool, this license is free of charge.

SFIA*plus*

BCS, the Chartered Institute for IT, have further developed an add-on to the core SFIA framework, which is called SFIA***plus***.

Within the SFIA***plus*** structure, the Level-specific Skills are called Tasks. These are further broken out into a series of Work Activities (WAs), which provide specific actions and undertakings that contribute to executing the Task. WAs should be assigned to and addressed by individuals at the appropriate Level(s) of operation within the organisation.

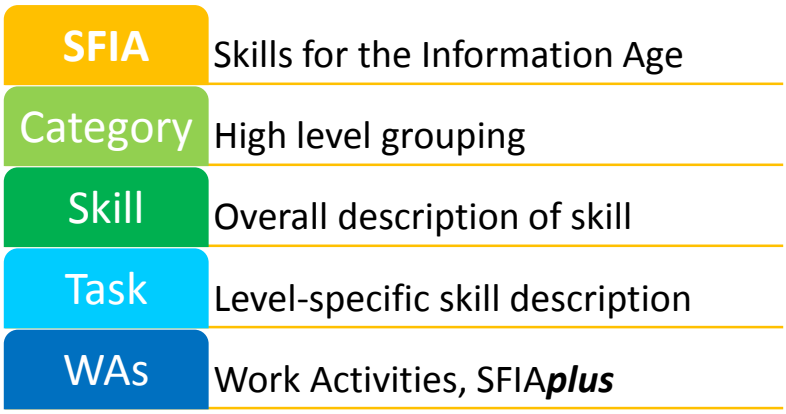

*Figure 3: Structure of SFIA and SFIA**plus***

SFIA***plus*** also provides additional components for each Task, which offer an extra level of detail about what is expected from an individual working at this Level. These include suggestions as to the

[1] https://www.sfia-online.org/en

types of knowledge and skills, training activities, professional development, and qualifications required.

Analogous levels of granularity

The frameworks were mapped to each other at the lowest possible level of comparable granularity: IT-CMF's CBBs to SFIA***plus***'s WAs (see Figure 4). Although the mapping was done between IT-CMF and SFIA***plus***, the design of SFIA***plus*** allows us to report relationships between the IT-CMF and SFIA at higher levels of abstraction.

The CBBs offer the most detailed general description of an area of capability within the IT-CMF. The Maturity Models and Practices-Outcomes-Metrics (POMs) that sit beneath the CBBs describe the capability in more specific maturity-defining ways.

The WAs similarly offer the most detailed view of how a skill is demonstrated at various levels of operation within the organisation, i.e. what should be actioned by senior management, middle management, specialists, junior staff, etc. The Level at which a Skill is operating is not, therefore, maturity-dependent.

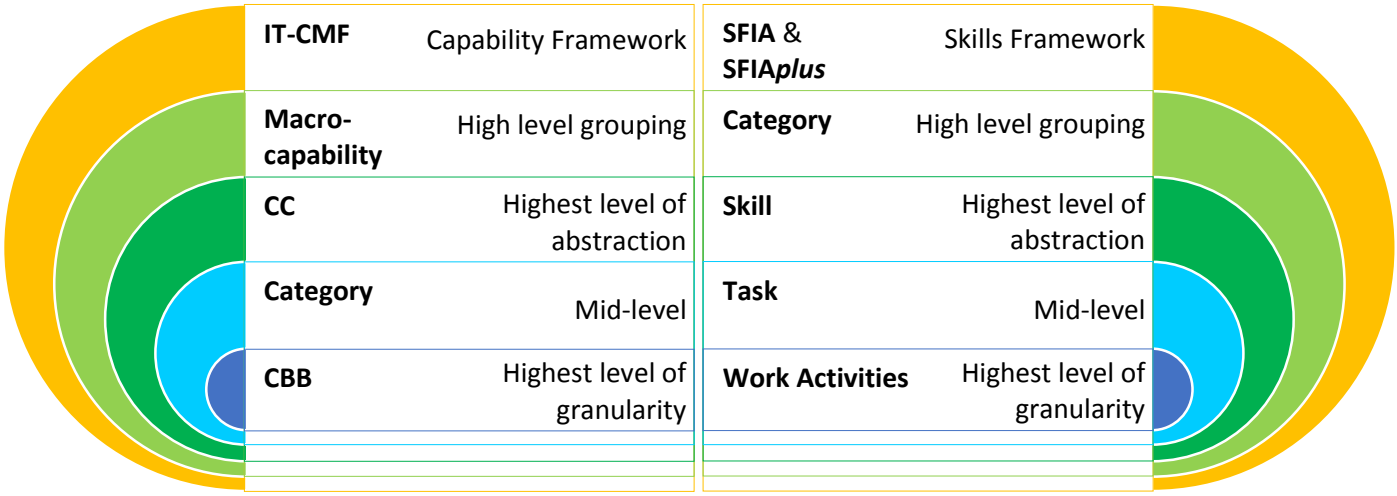

Figure 4: Levels of abstraction and granularity

Mapping exercise

The mapping from IT-CMF to SFIA was conducted by Sinéad Murnane and Clare Thornley between January and September 2017.

Selection of Capabilities

It was decided to base the mapping exercise on the currently published version of the IT-CMF[2] and SFIA***plus*** based on SFIA v6. Any changes to the existing CCs as a result of the current redevelopment exercise can be reflected in a v2 mapping. Similarly, when SFIA is updated, the changes to mapping can be reflected in later iterations.

The 36 Critical Capabilities were divided into groups of closely related CCs and prioritised for action based on the capability areas with most demand. (See Figure 8 below.)

[2] IT Capability Maturity Framework™ (IT-CMF™): The Body of Knowledge Guide, 2nd Edition (2016)

Identification of relevant Skills areas

Based on the selected CCs, potentially relevant Skills areas were identified in several ways:

- Cross-reference spreadsheet, marking correlations between SFIA Skills and IT-CMF Capabilities, prepared by Roy Shepherd of BCS (high level of abstraction)
- Reference to associated Job Roles to find SFIA Skills and Tasks (medium level of abstraction)
- Review of list of SFIA Skills and descriptions to identify any additional potential corollaries
- Consultation with IVI Researchers responsible for the particular Capability area to identify any further Skills areas for inclusion

Once the Skills areas were identified, the lists of WAs associated with each of those Skills were gathered.

Level of mapping

The list of WAs based on the identified Skills were compared to the CBBs of the selected CC(s). Any WAs that were judged to fit within the requirements or actions described by the CBB were noted. Each CBB had multiple WAs mapped to it. Often several distinct Skills areas contributed to each CBB. Similarly, WAs could be mapped to multiple CBBs (in multiple CCs) when relevant.

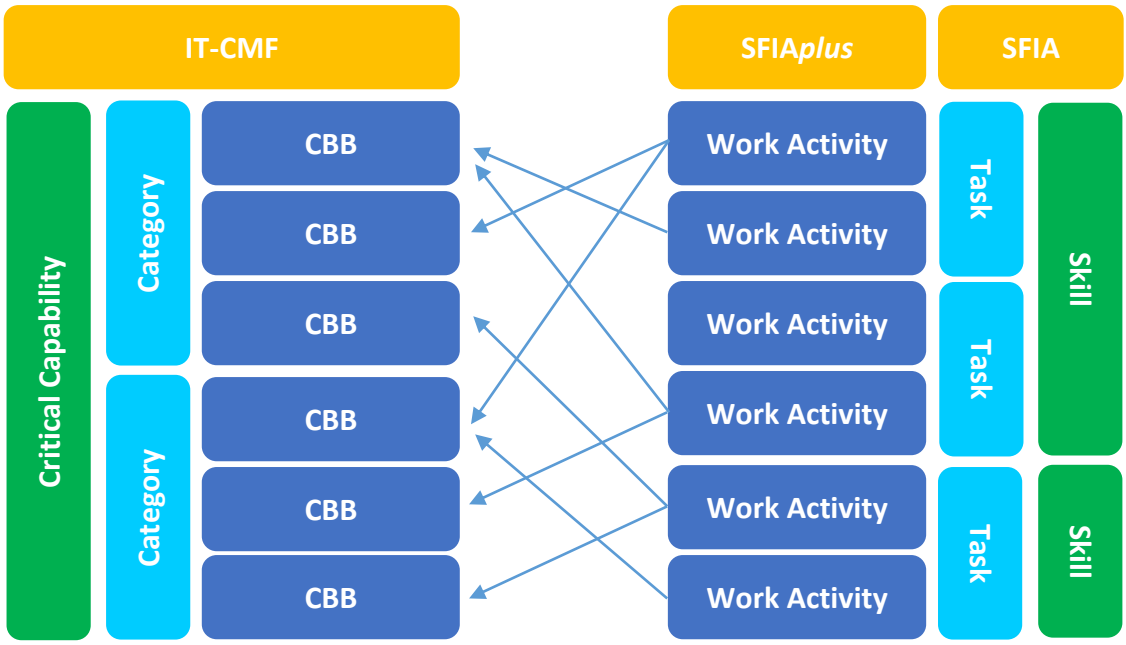

Figure 5: Illustrative example of mapping

By mapping between the frameworks at the lowest level of granularity, we will be able to provide extremely detailed and targeted Skills-based information to organisations working to improve a particular capability. It will also be possible to roll the information up and provide much more summarised reports of the associated Skills in each capability area.

Primary and Secondary mapping

In cases where a high number of Skills were identified for a capability area, we differentiated between 'Primary' (highly relevant or closely correlated skills) and 'Secondary' (useful, relevant, or associated skills) connections.

Database

We developed a relational database using MS Access to manage the volume of data being generated through the mapping, which would also allow us to create usable reports bringing the IT-CMF and SFIA together. The database was developed from February and went through several iterations over the following months.

We used Tables build out the structure of the IT-CMF ①, SFIA ②, and SFIA***plus*** ③, and a joining table that links the IT-CMF to SFIA and SFIA***plus*** through the mapping between CBBs and WAs ④, (see Figure 6). All SFIA, SFIA***plus***, and IT-CMF tables were fully populated by July, while the mapping exercise was ongoing.

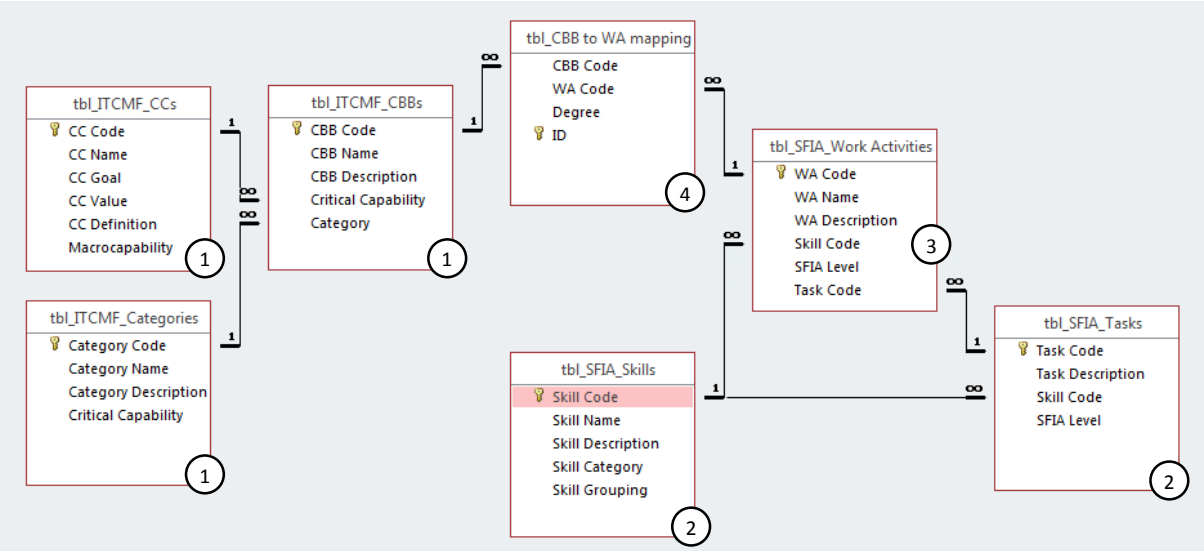

Figure 6: Relationships between database tables

There are over 3,100 unique data records in the joining table linking the IT-CMF to SFIA***plus***.

Queries are used to interrogate the tables to provide Skills-related information associated with specific CCs. These are then replicated as more user-friendly Reports for client organisations and/or assessors.

Usable Assets

The granularity of the mapping allows considerable flexibility in terms of how the information can be presented to users depending on their requirements. Through use of these knowledge assets with organisations, we will test their usefulness, refine the existing reports, and develop new reports to fulfil their requirements.

With the query and reporting tools in Access, we have developed a series of preliminary reports that can be used to augment an organisation's capability improvement planning and implementation (see Figure 7).

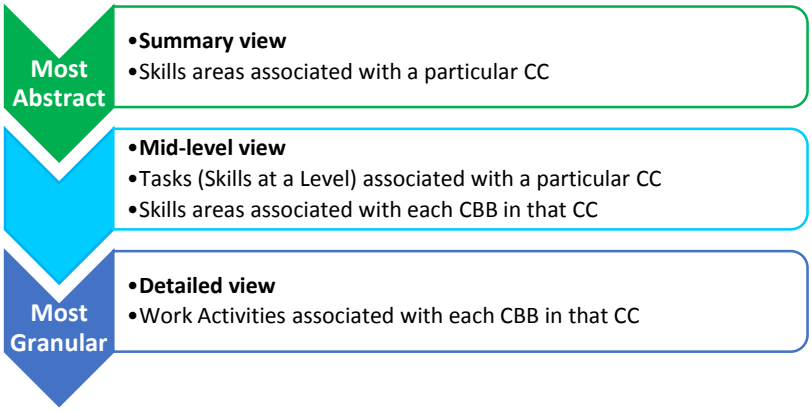

Figure 7: Available reports

These initial reports have been designed from the perspective of an organisation wishing to improve a particular capability area. The target area may be identified through an IVI Assessment, or by the organisation themselves. The SFIA material is introduced as an aid to improvement planning and implementation. In the first instance, more high-level summarised information is offered. As the improvement initiative(s) progress – and as the organisation's familiarity with SFIA increases – more specific Task and Work Activity details are available through SFIA***plus***.

Project Timeline

This project was first launched at the Innovation Value Institute's (IVI) Winter Summit in December 2016. The first group of IT-CMF CCs were mapped in January and February 2017. We developed a relational database using MS Access to manage the volume of data being generated through the mapping, which would also allow us to create usable reports bringing the IT-CMF and SFIA together. The database was developed from February and went through several iterations over the following months.

All SFIA, SFIA***plus***, and IT-CMF tables were fully populated by July. The mapping exercise between the IT-CMF and SFIA***plus*** was completed in mid-September 2017.

Conceptual Validation

We presented the proposal for this project as an initial validation-of-concept at IVI's Winter Summit in December 2016. In conjunction with Robert Streeter (BCS) and Ian Seward (SFIA Foundation), we introduced the connection between skills and capabilities as a key driver for this body of work and outlined the preliminary proposal for our approach to it.

Over the course of the following months, our approach to mapping the two frameworks was refined as our understanding of how the connections between them could be better leveraged. We also began to develop potential use cases for organisations and created usable knowledge assets that could assist organisations to develop achievable capability improvement plans.

We met with BCS and the SFIA Foundation in London in May 2017 to validate the proposed use case and the mapping that had been completed by that point. Both Robert and Ian felt that there was strong potential for the work that had been done to be useful to SFIA Consultants, as well as to the IVI Community.

At IVI's Summer Summit in June 2017, we presented a more developed use case and associated reports for feedback and validation from the Members.

Progress Timeline to date

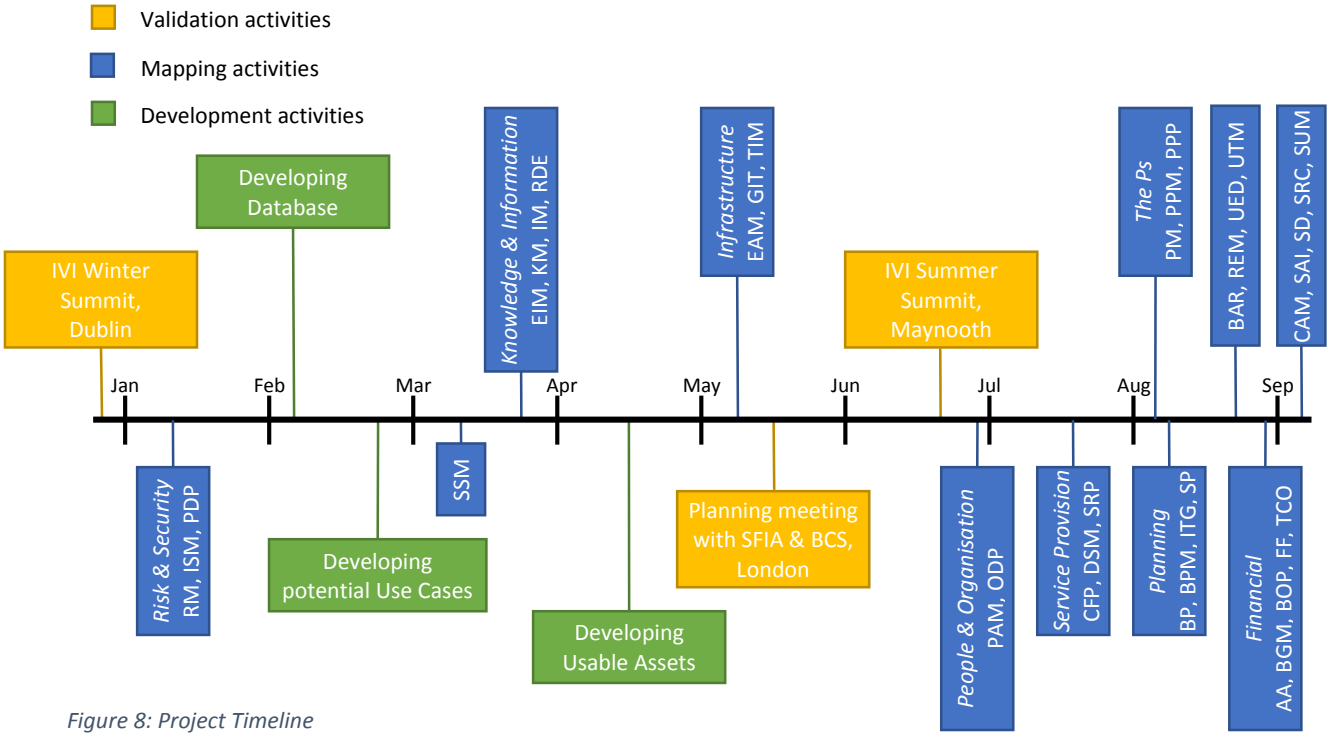

Figure 8: Project Timeline

Next steps

Validation

Our immediate priority is to find an organisation with whom to pilot this addition to the tools available for capability improvement planning. Ideally, we would work alongside an organisation that has recently completed an IT Effectiveness Assessment to identify their target capabilities. Through this pilot, we will be able to validate the mapping, test and refine the available reports, design tools to provide this information more easily, and further substantiate the concept.

Further mapping

The database can be extended to include mapping to other globally recognised Skills frameworks, such as the European e-Competence Framework (eCF) and the Japanese i-Competency Dictionary (iCD). It is important to note, however, that while it may be useful to identify where SFIA Skills, eCF Competences, and iCD Tasks are considered relevant to the same CBB(s), it would be misleading to assume an equivalence between them.

Improvements to IT-CMF

Having completed the mapping exercise, we can now interrogate the IT-CMF in new ways, revealing interdependencies, overlaps, or potential gaps.

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Appendix 1

IT-CMF Critical Capabilities

Managing IT like a Business		Managing the IT Budget		Managing the IT Capability		Managing IT for Business Value	
AA	Accounting & Allocation	BGM	Budget Management	CAM	Capability Assessment Management	BAR	Benefits Assessment & Realisation
BP	Business Planning	BOP	Budget Oversight & Performance Analysis	EAM	Enterprise Architecture Management	PM	Portfolio Management
BPM	Business Process Management	FF	Funding & Financing	ISM	Information Security Management	TCO	Total Cost of Ownership
CFP	Capacity Forecasting & Planning	PPP	Portfolio Planning & Prioritisation	KM	Knowledge Management		
DSM	Demand & Supply Management			PAM	People Asset Management		
EIM	Enterprise Information Management			PDP	Personal Data Privacy		
GIT	Green IT			PPM	Programme & Project Management		
IM	Innovation Management			REM	Relationship Management		
ITG	IT Governance & Leadership			RDE	Research, Development & Engineering		
ODP	Organisational Design & Planning			SRP	Service Provisioning		
RM	Risk Management			SD	Solutions Delivery		
SAI	Service Analytics & Intelligence			SUM	Supplier Management		
SRC	Sourcing			TIM	Technical Infrastructure Management		
SP	Strategic Planning			UED	User Experience Design		
SSM	Sourcing & Supplier Management			UTM	User Training Management		

Appendix 2

SFIA Skills v6

Category	Skill
Strategy & Architecture	
Information Strategy	IT governance
	IT strategy and planning
	Information management
	Information systems coordination
	Information security
	Information assurance
	Analytics
	Information content publishing
Advice & Guidance	Consultancy
	Technical specialism
Business Strategy & Planning	Research
	IT management
	Financial management
	Innovation
	Business process improvement
	Enterprise and business architecture
	Business risk management
	Sustainability strategy
Technical Strategy & Planning	Emerging technology monitoring
	Continuity management
	Sustainability management
	Network planning
	Solution architecture
	Data management
	Methods and tools
Change & Transformation	
Business Change Implementation	Portfolio management
	Programme management
	Project management
	Portfolio, programme and project support
Business Change Management	Business analysis
	Requirements definition and management
	Business process testing
	Change implementation planning and management
	Organisation design and implementation
	Benefits management
	Business modelling
	Sustainability assessment
Development & Implementation	
Systems development	Systems development management
	Data analysis
	System design
	Network design
	Database design
	Programming/software development
	Animation development
	Safety engineering
	Sustainability engineering
	Information content authoring
	Testing
User Experience	User experience analysis
	User experience design
	User experience evaluation
Installation & Integration	Systems integration
	Porting/software configuration
	Hardware design
	Systems installation/decommissioning

Category	Skill
Delivery & Operation	
Service Design	Availability management
	Service level management
Service Transition	Service acceptance
	Configuration management
	Asset management
	Change management
	Release and deployment
Service Operation	System software
	Capacity management
	Security administration
	Penetration testing
	Radio frequency engineering
	Applications support
	IT infrastructure
	Database administration
	Storage management
	Network support
	Problem management
	Incident management
	Facilities management
Skills & Quality	
Skill Management	Learning and development management
	Learning assessment and evaluation
	Learning design and development
	Learning delivery
	Teaching and subject formation
People Management	Performance management
	Resourcing
	Professional development
Quality & Conformance	Quality management
	Quality assurance
	Quality Standards
	Conformance review
	Safety assessment
	Digital forensics
Relationships & Engagement	
Stakeholder Management	Sourcing
	Contract management
	Relationship management
	Customer service support
Sales & Marketing	Digital marketing
	Selling
	Sales support
	Product management