Final Document

LEXiCON Phase 2 - Summary Report

2022

CONSTRUCTION INNOVATION HUB

UK Research and Innovation

About the Construction Innovation Hub

Born out of the Construction Sector Deal and the Industrial Strategy Challenge Fund in 2018, the Construction Innovation Hub (the Hub) brings together world-class expertise from BRE, the Centre for Digital Built Britain (CDBB) at the University of Cambridge and the Manufacturing Technology Centre (MTC).

The Hub has worked with over 600 public and private sector organisations across the four core themes of Value, Manufacturing, Assurance and Digital, to co-develop solutions which enable better decision-making, drive digital transformation, improve delivery and accelerate sector recovery. The Hub and its partners are committed to fundamentally transforming UK construction so that it delivers better social, environmental and economic outcomes for current and future generations.

www.constructioninnovationhub.org.uk

About the Construction Products Association

The Construction Products Association (CPA) is the leading organisation that represents and champions construction product manufacturers and suppliers. This vital UK industry defines our built environment, providing the products and materials needed for homes, offices, shops, roads, railways, schools and hospitals. Our industry directly provides jobs for 382,500 people across 24,000 companies and has an annual turnover of £63 billion.

One of the CPA's three main objectives is to help drive the adoption of digital technologies and processes to make for a smarter, more efficient construction industry.

www.constructionproducts.org.uk

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1. Foreword

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CIBSE Technical Director

The "Golden Thread" is one of the phrases of the year in construction. It is being used to describe the creation, collation, management, exchange and transfer of digital information about built environment assets, and has been given currency by the use of the term in Dame Judith Hackitt's review of building regulations and fire safety. Although it is important to recognise that in that context it refers explicitly to the information relating to higher risk buildings, it has given a fresh impetus to the topic of digital information management and exchange.

This is a very welcome development. The built environment is behind the curve in its adoption of digital information management tools and technologies. Perhaps this is in part due to the fragmented and sometimes adversarial nature of the business, perhaps due to the very low margins in the sector and the very large number of SME's operating in construction, inhibiting investment in general and limiting the uptake of new technologies unless they yield immediate benefits. The irony of this is that digital technology properly and systematically implemented offers the potential to reduce costs, increase margins and improve quality outcomes.

That is why this report is so timely, focusing as it does on what is needed to enable the creation of product data in a format that can be exchanged and transferred through the supply chain and into operation. Whilst the regulatory requirement for the Golden Thread may be limited, its is totally unrealistic to expect the leading commercial clients and developers not to want to see similar progress in the delivery of consistent, accurate, reliable digital data on the projects they fund and manage?

In May 2022, the Hub and CPA published a methodology for Product Data Templates, which set out the basic principles of how digital standardised product information could be delivered through industry consensus methods.

This report now develops those principles and begin to apply them to facilitate the creation, management and maintenance of product data templates. It outlines the processes that are being developed for testing and validation. Publication of the report serves as an opportunity to encourage industry to participate in LEXiCON and to influence the further development of what may be required of them in the future.

This report is also timely as an illustration of the power and the opportunity of constructive industry engagement. Those who are best placed to develop the protocols and procedures to underpin digital information management and exchange are those with many years of practical experience of the subject, and perhaps with a scar or two to prove what they have had to overcome. Those people are usually to be found working in industry and rarely in administrative roles. If the industry wants to shape the future of digital information management in the sector then now is a very good time to step up and play a role in the further development of LEXICON and indeed the wider UK information management infrastructure for the built environment.

2. Executive summary

The built environment sector is made up of many industries, all communicating in different ways, across many subjects. The construction products industry is not immune to this fragmentation, and despite various initiatives to harmonise product information, it is still displayed and consumed in diverse and unconnected ways. To realise the true benefits of digitalisation, construction product data needs to be integrated, co-ordinated, and made both human-readable and machine-interpretable. Through this, we can join up the built environment sector with product information that is appropriate to all audiences, and can be better utilised towards building safety, decarbonisation and other sustainability outcomes and a myriad of other benefits.

The aim of the LEXiCON project is to support international good practice for the creation and management of product data by standardising the production, use, and management of Product Data Templates. This will be achieved through the development of a consensus process for the collaborative formation of Product Data Templates and a software service with a free to access portal to facilitate the creation, grouping, filtering and verification of properties to form the Product Data Templates (**PDT**s).

In May 2022, the Construction Innovation Hub (the Hub) published LEXiCON Methodology: Creating Relevant Authorities and Achieving Consensus in partnership with the Construction Products Association (CPA). That report confirmed the founding principles of how digital standardised product information could be achieved through industry consensus methods, and brought a conclusion to what was considered 'phase one' of the project.

Entering 'phase two' this report looks to build upon those principles and begin to paint the details in. where that report could be considered a founding document, this one describes work still in development, as the LEXiCON Development Group (DG)[1] are still designing the practical steps necessary to facilitate the creation, management and maintenance of product data templates (**PDT**s). This report doesn't catalogue a final product, but is a first draft of processes that will still require testing and development. Its aim is to update industry on the work that has been completed to date, give a clear position on the work yet to be completed, and to allow industries who would like to participate in LEXiCON to anticipate what will likely be required of them.

In this phase two, the LEXiCON DG, has concentrated on describing practical processes and illustrating a minimal viable product (MVP) for the following areas:

1. Registration processes:
    a. The registration of individuals (including the different levels of permissions that would allow different ranges of tasks)
    b. The registration of organisations
    c. The registration of Relevant Authorities (**RA**)
    d. The registration of working groups (**WG**)
2. **PDT** creation processes and master template:
    a. Master template
    b. Identifying the topic

1 In the LEXiCON Methodology – Creating Relevant Authorities and achieving consensus report, the LEXiCON Development Group was referred to as the LEXiCON Steering Group, however as there is due to be a LEXiCON Steering Group in the governance system, this name has been changed for clarification.

    c. Appointing a working group
    d. Identifying interested parties
    e. Creating a **PDT**
    f. Publishing a **PDT**
    g. Feedback for a **PDT**
3. MVP LEXiCON platform
    a. Registration
    b. Discovery of
        i. Existing **RA**s
        ii. **RA**s to be identified
        iii. Existing **PDT**s
        iv. **PDT**s identified (promised)
        v. Topics under the remit of an existing **RA**
    c. Process configuration
        i. Template creation
        ii. Property creation
    d. User management
    e. Library curation
    f. Export formats
    g. Subdomain management

The report also outlines topics for future consideration, such as governance processes, inhouse testing, maintenance and training. The next steps of the LEXiCON project will aim to further develop the processes and software platform, and ready it for beta-testing.

3. Background

A first phase of the LEXiCON project was initiated by Construction Products Association (CPA) in 2016, when BRE responded to an invitation to deliver part of the work. When the Construction Innovation Hub was launched in November 2018, BRE, as a core partner of the Hub, was awarded funding to further develop LEXiCON in support of the Hub's wider programme ambitions, which include transforming the sector through digital ways of working and modern methods of construction, via better information management to support BEIS' Information Management Framework.

This phase of the LEXiCON project facilitated a partnership between the Hub and the CPA, working in close collaboration with key industry stakeholders and experts, and built on the groundwork that had already taken place. The funding provided by the Hub enabled industry to develop processes for RAs and wider LEXiCON procedures and concepts and what that could look like with supporting technologies, laying the foundations that aims for a free-to-use industry-wide application for the collaborative formation of product data templates.

The ultimate goal for LEXiCON is to have templates and properties that have undergone the LEXiCON process with its consensus framework at its heart. The Hub Programme have developed a proof of concept system that demonstrates how the features required going beyond the requirements of a data dictionary to achieve specific LEXiCON concepts and also provides a framework for such elements which might be beneficial more widely to data dictionaries in general.

The landscape for data dictionaries has changed since The Hub embarked on its agenda of transforming construction.

Back in 2019, ISO 23386 and 23387 were still being drafted. PAS 14191 was in progress and there was a reflection that was needed in how to move this area forward in the U.K.

The project set out with four areas.

- engage industry
- identifying best practice
- tool development
- demonstration

Symbology

Throughout this document, items may be accompanied by the following tags which mean the following:

'**MUST**' describes a requirement that must be satisfied in the final solutions for the solution to be considered a success.

'**SHOULD**' represents a high-priority item that should be included in the solution if it is possible.

'**COULD**' describes a requirement which is considered desirable but not necessary.

Throughout this document for some concepts we've used icons to represent them.

Key **abbreviations** are fully written in their first occurance and are **highlighted orange** throughout the document. Greyscale icons indicate concepts which are mentioned but generally **out of scope of Phase 1 and 2 work**

This document also uses the generic terms ***WHO***, ***WHAT***, ***WHEN***, ***HOW*** to help users imagine user experience and user interface concepts

Concept	Icon	Abbrev	Type
User			***WHO***
Organisation			***WHO***
Relevant Authority		RA	***WHO***
Working Group		WG	***WHO***
Guest User			***WHO***
Registered User			***WHO***
Service Provider			***WHO***
Product Data Template		PDT	***WHAT***

Concept	Icon	Abbrev	Type
Workflow path			***HOW***
Stage			***WHEN***
State			***WHEN***
Status			***WHEN***
Edit			Action*
Comment			Action*
Visibility			Action*
Property			***WHAT***

icons are drawn from or based on open license widely used resources https://fontawesome.com/license/free. Permissable adaptations made by the Hub follow the same CC, SIL OFT and MIT license with attribution principles.

*Actions shown here are not exhaustive.

4. Registration processes

Key Findings

- There are 4 main registration scenarios - Individual users, Organisations, Relevant Authorities, LEXiCON service providers.
- A detailed breakdown of what a Relevant Authority (RA) and Working Group (WG) is, and the roles and responsibilities of each.

There will be three main scenarios for registration to a LEXiCON hosting service dictionary provider. These registration scenarios are:

1. Individual user
2. An organisation
3. Relevant Authority (**RA**)
4. LEXiCON Service provider - API access (Out of scope see Future Considerations Section)

Each of the scenarios will contain multiple roles. The process for registration and the tasks that each role can undertake are unique.

These processes are still under development, and many of the described steps will be dependent on what can practicably achieved within the LEXiCON platform. Also, some processes may be considered optional. As such some of the process steps are accompanied by a '**MUST**', '**SHOULD**' or '**COULD**' statement.

4.1 Individual user registration

There will be two types of individual user:

Guest User (**MUST**)

Registered User (**MUST**)

Each user type will have different permissions to interact with the LEXiCON platform as set out below.

4.1.1 Guest user

A guest user can access the LEXiCON platform without supplying any identification information. They will have permission to:

1. Discover / view Relevant Authorities (**MUST**)
2. Discover / view published **PDT**s (**MUST**)

3. Discover / view agreed properties (**MUST**)
4. Discover / view proposed **PDT**s (**MUST**)
5. Discover / view statuses of **PDT**s in progress (**MUST**)
6. Discover / view **PDT**s that are available for public consultation (**SHOULD**)
7. Discover / view proposed **RA**s (**SHOULD**)

However, if guest users want to further interact with LEXiCON e.g. download a **PDT**, follow a Relevant Authority, or suggest a **PDT**, they will have to register on the LEXiCON platform and become a Registered user as per below. (**MUST**)

4.1.2 Registered user

To further interact with the LEXiCON platform users will be required to register.

4.1.3 Registration process

To register, a user will need to submit the following information:

1. User's full name (**MUST**)
2. User's email address (ideally this will be associated with their work) (**MUST**)
3. Organisation they belong to (**COULD**)
4. Consent to terms and conditions and privacy policy of the hosting system of the LEXiCON platform (**MUST**)

Upon submission of this information via the LEXiCON platform services, the user will be sent a verification email to confirm. (**MUST**)

Upon registration the user's profile can become searchable by Relevant Authorities and organisations as default. (**MUST**)

4.1.4 What can a registered user do?

Registering will expand on the number of permissions a user has and allow them the opportunity to interact with **RA**s and organisations through the LEXiCON platform. The permissions available to a registered user additional to that of a guest user will include[1] :

1. Download/export a **PDT** (**MUST**)
2. Follow a **RA**

   Following an **RA** will allow a user to be notified if the **RA** proposes a **PDT**, publishes a draft **PDT** for public consultation, publishes a **PDT** or amends any **PDT**s under its remit. (**SHOULD**)
3. Follow a **PDT**

   After proposal, a **PDT** can be followed. This will allow a user to be notified if the **PDT**'s status has been changed, e.g. if it has been published as a draft for public consultation, published or amended. (**SHOULD**)
4. Register interest with a **RA**

1 This is not an exhaustive list

Identify the registered willingness to be considered as a **RA** committee member. (**MUST**)

5. Register interest for a working group (**WG**)

   Identify the registered user as an 'interested party' and their willingness to be considered as a member *of that* **WG**. *(***MUST***)*

6. Suggest a new **PDT**

   This suggestion can be made either to an existing **RA** if it can be clearly identified, or to the LEXiCON Board if not. (**MUST**)

7. Comment on **PDT** public consultations (**MUST**)
8. Feedback on existing **PDT**s (**MUST**)
9. Suggest a new **RA**

   Where a registered user has identified a need for an **RA**, they may send a suggestion for consideration by the LEXiCON Board. These suggestions should describe ***WHAT*** the need is, and where possible identify ***WHO*** would be appropriate to fulfil that role.

   Suggestions should be made by those not already going through the process of applying to become that **RA**.

   Note: Suggestions for new **RA**s will be reviewed as to their appropriateness and if successful will be dependent on an organisation being willing to establish themselves as an **RA**. (**SHOULD**)

10. Register an organisation (also necessary to apply to establish an **RA**) (**MUST**)
11. Seek authorisation to comment on behalf of an organisation (**SHOULD**)
12. Expand profile details (**COULD**)
13. Receive notifications of proposed **RA**s (**COULD**)
14. Log any comments in response to a proposed **RA** (**MUST**)
15. Amend their contact details (**MUST**)

4.2 Organisation registration

Organisations can register on the LEXiCON services to be kept up to date with the ongoing work of LEXiCON and be sufficiently represented at key decision points. For those planning to apply as a Relevant Authority, they would need to be registered as an organisation first. (**MUST**)

4.2.1 Registration process

To register, an organisation will need to submit the following information:

1. Organisation name (**MUST**)
2. Point of contact (POC) full name (**MUST**)

   Note: minimum one

3. POC email address (**MUST**)

   The lead POC will be the main point of contact for the organisation and will be able to authorise all organisation decisions on the LEXiCON platform (e.g. decide to create users for their personnel, decide to update details, decide to subscribe or unsubscribe to an **RA** (an organisational subscription that is effectively inherited by their users within the organisation)).

Note: the email address domain name must be that belonging to the organisation

4. Lead POC job title (**COULD**)
5. Area of interest (**COULD**)
6. Organisation SIC codes (**SHOULD**)

   This will be to identify ***WHAT*** parts of the industry the organisation covers.

7. Organisation product classifications (**COULD**)
8. Organisation additional administrative support name (**COULD**)

   This will identify a member of the organisation that can administrate on behalf of the organisation.

   Note: An organisation can nominate more than one additional administrative support.

9. Organisation administrative support email (**COULD**)

   Note: the email address domain name must be that belonging to the organisation

10. Consent to terms and conditions of the hosting system of the LEXiCON platform (**MUST**)

4.2.2 What can a registered organisation do?

4.2.2.1 Organisation Point of Contact (POC)

An Organisation POC will have the following permissions additional to that of a registered user:

1. Add new registered users or invite registered users to become organisation members.

   Organisation members will automatically receive as default all the notifications of the **RA**s and **PDT**s that the organisation follows. (**MUST**)

2. Associate or disassociate a registered user as authorised to comment on their behalf

   Registered users recognised as authorised to comment on the organisation's behalf will be able to demonstrate on LEXiCON that they are speaking as a representative of the organisation. They will be expected to appropriately collect perspectives from that organisation or those the organisation represents.

   Note: Registered users authorised to comment on an organisation's behalf do not need to be directly employed by that organisation. (**MUST**)

3. Follow **RA**s on behalf of the organisation

   Following an **RA** will allow the organisation and all the organisation members to be notified if the **RA** proposes, publishes draft **PDT**s for public consultation, publishes or amends any **PDT**s under its remit. (**SHOULD**)

4. Register interest with a **RA** on behalf of the organisation

   Registering interest will identify an organisation's willingness to supply a representative to be considered as a **RA** committee member. (**SHOULD**)

5. Follow **PDT**s

After proposal, a **PDT** can be followed. This will allow an organisation and all the organisation members to be notified if the **PDT**'s status has been changed, e.g. if it has been published as a draft for public consultation, published or amended. (**SHOULD**)

6. Register interest for a **WG**

   Registering interest for a **WG** will identify an organisation as an 'interested party' and the organisation's willingness to supply a representative to be considered as a member of that **WG**. (**MUST**)

7. Suggest a new **PDT** on behalf of the organisation

   This suggestion can be made either to an existing **RA** if it can be clearly identified, or to the LEXiCON Board if not. (**SHOULD**)

8. Comment on **PDT** public consultations on behalf of the organisation (**MUST**)
9. Feedback on existing **PDT**s on behalf of the organisation (**MUST**)
10. Suggest a new **RA** on behalf of the organisation (**SHOULD**)

    Where an organisation has identified a need for an **RA**, they may send a suggestion for consideration by the LEXiCON Board. These suggestions should describe ***WHAT*** the need is, and where possible identify bodies that would be appropriate to fulfil that role.

    Suggestions should be made by those not already going through the process of applying to become that **RA**.

    Note: Suggestions for new **RA**s will be reviewed as to their appropriateness and if successful will be dependent on an organisation being willing to establish themselves as an **RA**.

11. Log any comments of support or objection to a proposed **RA** on behalf of the organisation. (**MUST**)
12. Submit an application to become an **RA**. (**MUST**) (ref)

4.2.2.2 Organisation administration

The organisation administration will have identical permissions to the organisation POCs, but will be expected to use them under their instruction.

4.2.2.3 Organisation members

Organisation members will not have any additional permissions to a registered user, but will receive notifications on **RA**s and **PDT**s that the organisation has followed. (**COULD**)

4.2.2.4 Registered users authorised to comment on an organisation's behalf

There is no limit on the number of organisations that a registered user can be authorised to represent. Registered users will be able to select one or many organisations that their comments can represent. (**SHOULD**)

4.3 Relevant Authority (RA) Registration

4.3.1 What is a Relevant Authority?

A Relevant Authority (**RA**) is defined as a recognised body with a requisite expertise concerning products included in its area of jurisdiction.

*Note: Further description of **WHAT** an **RA** is and **WHO** can become an **RA** is described in LEXiCON Methodology: Creating Relevant Authorities and Achieving Consensus*

4.3.2 Who can become a Relevant Authority(**RA**)?

Registered organisations may apply to become Relevant Authorities to oversee the creation, management and maintenance of **PDT**s under its area of jurisdiction (remit).

Any organisation may apply to become an **RA**, but for the application to be successful they will need to demonstrate that they can fulfil the following criteria:

1. That they have appropriate oversite of their remit and confidence of their area of the industry, and industries that they interact with and that their appointment would not be easily contradicted without cause (**MUST**)
2. That they can identify a definition of their remit and its boundaries (**MUST**)
3. That they can coordinate and convene appropriate perspectives to inform the **PDT**s under their remit (**MUST**)
4. That they can deliver appropriate consensus during the creation and management of **PDT**s within their remit (**MUST**)
5. Ability to maintain collaborative and inclusive relationships with others and contextualise it within the context of undertaking their duties as an **RA** (**MUST**)
6. They have the available resource to fulfil the commitment to the creation, publish and management of **PDT**s under their remit (**MUST**)
7. That the definition of their remit and its boundaries is not similar to or overlapping with that of an existing **RA** other than where co-operation has been agreed. (**MUST**)

   *Note: Ideally, Trade Associations are a natural fit to become an **RA**, although applications will not be limited to Trade Associations.*

Organisations may be invited to register and apply to become an **RA** by the LEXiCON Board if a gap has been identified that requires **PDT**s.

To register as an **RA**, organisations will already have to be registered organisations on the LEXiCON platform. (**MUST**)

4.3.3 What resource is required to become an RA?

An **RA** shall have at minimum the resource to create a management team and a membership such that they can draw appropriate expertise on construction products within the remit they have oversite for.

An **RA** management team will be comprised of as minimum:

- The **RA** manager

- The RA chair
- WG leads
- RA committee members

An RA management team can additionally be comprised of:

- The RA secretary
- The RA vice chair

The following provides details of the activities and actions that these roles emobdy:

1. The RA manager (**MUST**)

   The RA manager will be the main point of contact and will be responsible for managing the Relevant Authority and ensuring the appointment of the RA chair

2. The RA secretary (**COULD**)

   The RA secretary will facilitate the administration duties of the RA under the instruction of the RA manager.

3. The RA chair (**MUST**)

   The RA chair will be an elected position that will be responsible for achieving consensus as to the direction and priorities of the RA. The RA chair should hold their term no longer than two years before a new election is held.

   Note: An RA chair may be re-elected after their term has ended.

4. The RA vice chair (**COULD**)

   The RA vice chair will be an optional elected position that will be responsible for supporting the RA chair in achieving consensus as to the direction and priorities of the RA. The RA vice chair should hold their term no longer than two years before a new election is held.

   Note: An RA vice chair may be re-elected after their term has ended.

5. WG leads (**MUST**)

   The WG leads chair WGs to create PDTs for the topics that the RA has identified

   Note: WG leads would also be RA committee members

6. RA committee members (**MUST**)

   RA committee members would responsible for contributing to the direction and priorities of the RA via consensus. They may be drawn directly from the RA organisation's membership or from other external sources.

   RA committee members would be responsible for identifying topics for PDTs, both from suggestions from within the RA and reviewing external suggestions. They would also be responsible for counter-reviewing PDTs created by WGs, quality control, approving PDTs for publish, and overall management of the PDTs under the RA.

   RA committee members would be added as agreed between the RA Manager and the RA Chair.

4.3.4 How do you become an RA?

The appropriateness of an **RA** will be assessed via an application process that will be composed of the following stages:

1. An application form (**MUST**)
2. An interview (**MUST**)
3. Proposed **RA** notice period (**MUST**)

The aim of the application process will be for the LEXiCON Board to establish that the organisation can demonstrate the criteria described in .

An application does not have to go through all three stages for the LEXiCON Board to deem the application not successful.

The LEXiCON Board will not be seeking to dictate to areas of industry ***WHO*** will be the most appropriate organisation to become an **RA**. Where there are multiple **RA** applicants that appear to fulfil the criteria described in for similar or overlapping remits, the LEXiCON Board will follow the following process to facilitate a resolution:

1. Introduce applicants to each other or other clear stakeholders that they may agree within themselves ***HOW*** to proceed;
2. Where no agreement is found; facilitate conversations between organisations to help achieve an agreement;
3. Where no agreement can be achieved, only then shall the LEXiCON Board be the final arbiter. The decision of the LEXiCON Board will be final.

   *Note: The third process step would not be expected to be a regular occurrence.(**MUST**)*

4.3.5 RA application form

The application form will require the following:

1. Relevant Authority proposed name (**MUST**)

   This name will identify the representative remit of the Relevant Authority in as simple terms as possible. E.g. Fenestration Relevant Authority, Finishes and Interiors Relevant Authority.
2. Name of organisation/organisations the application is being made on behalf of (**MUST**)

   This name will identify the lead organisation or organisations applying for Relevant Authority status.

   Note: At least one organisation should have legal status
3. Organisation type (**MUST**)

   This will describe type of organisation it will represent (e.g. Trade Association, Manufacturer, Designer etc.)
4. Organisation contact name (**MUST**)

   This will be the main point of contact for the proposed **RA** a.k.a the proposed '**RA** Manager'
5. Organisation contact email (**MUST**)

This will be the email address of the proposed **RA** manager. The email address should be valid to that organisation.

6. Relevant Authority proposed remit
    a. This will be as clear a description as possible of the construction product families / topics that the Relevant Authority will have remit over (**MUST**)
    b. The method of description will be through the use of SIC codes, classifications or other taxonomies, and supporting free text to describe the boundaries. (**MUST**)
    c. By describing this remit a prospective **RA** is essentially 'committing' they will seek to identify topics and deliver **PDT**s within it (**MUST**)
7. Evidence of oversite, horizon scanning and stakeholder inclusion

    The prospective **RA** will need to evidence that they would be appropriate to lead on topics within their remit. To evidence this they should describe:
    a. Their position, including the breadth of their representation in their industry (**MUST**)
    b. Their experience in bringing together consensus views in their industry (**SHOULD**)
    c. They have identified other organisations within their industry that would have an interest in creating **PDT**s in a similar or overlapping remit and
        i. Identify which organisations they have contacted (**SHOULD**)
        ii. Evidence that these organisations support or don't support the application (**SHOULD**)
        iii. The status of the attempt as it stands (**SHOULD**)
8. Suggested **RA** Chair (**COULD**)

    This would be the name and organisation of the suggested **RA** Chair.
9. Agree to the Terms and Conditions of the LEXiCON platform (**MUST**)

4.3.6 RA interview

Following the application, it will be likely that at least one interview will be necessary to expand on information presented within the application and help substantiate the appropriateness of the applicant.

The interview(s)[2] will be used as a method to:

1. Query any missing information; (**COULD**)
2. Potentially expand on information disclosed; (**COULD**)
3. Identify any missing stakeholders; (**COULD**)
4. Gain an understanding of the prospective **RA**s strategy, knowledge of drivers and barriers for the prospective **PDT**s under their remit; (**MUST**) and
5. Otherwise confirm whether or not the applicant has achieved the criteria for an **RA** as described in . (**MUST**)

4.3.7 Proposed RA notification period

Once the LEXiCON board has performed its necessary to due diligence to check the application of the prospective **RA**, a 'Proposed **RA** notice' will be posted on the LEXiCON platform for a minimum period of 1

2 The 'interviewer' and their attributes shall be described in 'governance processes' which is out of scope of this document and will be part of future considerations.

month. This will give registered users and organisations the opportunity to log any comments of support or objection. (**MUST**)

Where objections are made, they must describe ***HOW*** the proposed **RA** does not fulfil one or more of the criteria as outlined in to be considered. (**MUST**)

Where objections are logged, the LEXiCON Board will explore and assess the validity of the objection prior to resolving as to whether the prospective **RA** is or is not successful. (**MUST**)

4.3.8 RA application results

RA applications will conclude with one of the following results:

1. Application successful

   The application is deemed to achieve criteria outlined in 4.3.2. The LEXiCON Board will award the applicant Relevant Authority status.

   The new **RA** will be identified on the LEXiCON platform, and the appropriate permissions and support will be supplied for it to perform its role.

2. Application unsuccessful: further work required

   The application is deemed to not achieve the criteria outlined in 4.3.2, but there is potential that the applicant could achieve the criteria with further work. In these cases, the LEXiCON Board will identify the areas that further work needs to be achieved and demonstrated, and the applicant may reapply at a later date.

3. Application unsuccessful

   The application is deemed to not achieve the criteria outline in 4.3.2, and there is not a clear path of work to make the application successful. In these cases, the LEXiCON Board will identify the reasons that the application has been unsuccessful.

   Note: Abuse of the application process may result in an inability to submit future applications.

4.3.9 RA permissions on the LEXiCON platform

There are a variety of possible roles within the **RA**, and levels of permissions to enable individuals to perform these roles.

To be assigned appropriate permissions, individuals will already need to be registered users on the LEXiCON platform. (**MUST**)

1. The **RA** Manager

   The **RA** Manager will have the permissions to be able to:

   a. Assign/remove permissions for an **RA** chair (**MUST**)
   b. Assign/remove permissions for an **RA** vice chair (**MUST**)
   c. Assign/remove permissions for an **RA** secretary (**MUST**)
   d. Assign/remove permissions for a **WG** lead (**MUST**)
   e. Assign/remove permissions for a **WG** secretary (**MUST**)
   f. Publish proposals for **PDT**s (**MUST**)

g. Viewing rights for all PDTs within its remit at all statuses (**MUST**)
h. Commenting rights for Work In Progress (WIP) PDTs that have been submitted by WGs for RA comment (**MUST**)
i. Send and receive messages regarding the RA, PDTs and WGs (**MUST**)
j. Submit PDTs to the LEXiCON Steering Group for quality checks (**MUST**)
k. Publish/ decommission PDTs created or inherited that fall under its remit (**MUST**)

2. The RA secretary

   The RA secretary will have identical permissions to the RA manager, but will be expected to use them under instruction of the RA manager or RA chair / vice chair.

3. The RA chair

   The RA chair will have the permissions to be able to:

   a. Assign/remove permissions for a WG lead (**MUST**)
   b. Assign/remove permissions for a WG secretary (**MUST**)
   c. Publish proposals for PDTs (**MUST**)
   d. View all PDTs within its remit at all statuses (**MUST**)
   e. Comment on WIP PDTs that have been submitted by WGs for RA comment (**MUST**)
   f. Send and receive messages regarding the RA, PDTs and WGs (**MUST**)
   g. Submit PDTs to the LEXiCON Steering Group for quality checks (**MUST**)
   h. Publish/decommission PDTs created or inherited that fall under its remit (**MUST**)

4. The RA vice chair

   The RA vice chair will have identical permissions to the RA chair, but will be expected to use them in absence of or in support of the RA chair.

5. The WG leads

   The WG lead will have the permissions to be able to:

   a. Assign/remove permissions for a WG secretary (**MUST**)
   b. Assign/remove permissions for a WG member (**MUST**)
   c. Assign/remove permissions for a WG technical author (**MUST**)
   d. Edit and comment on PDTs that have been assigned to them (**MUST**)
   e. Create and edit properties and groups of properties (**MUST**)
   f. Submit PDTs to LEXiCON Steering Group for quality checks (**MUST**)
   g. Submit PDT to RA for review (**MUST**)
   h. Begin/end publication of WIP PDT for public consultation (**MUST**)
   i. Submit PDT to RA as ready to publish (**MUST**)
   j. Send and receive messages regarding the WG and PDTs under their WG (**MUST**)
   k. View all PDTs within the RA's remit at all statuses (**MUST**)

6. **RA committee members (MUST)**

   RA committee members would be members of the RA that would be responsible in driving the direction of the RA, identifying topics for the RA, reviewing topic suggestions and liaising with other RAs.

The **RA** committee members will have the permissions to:

a. View all **PDT**s within its remit at all statuses (**MUST**)
b. Commenting on WIP **PDT**s that have been submitted by **WG**s for **RA** comment (**MUST**)
c. Send and receive messages regarding the **WG** and **PDT**s under the **WG** (**MUST**)

4.4 RA Working Groups

4.4.1 RA Working Groups

The **RA** Working Groups (**WG**s) work as custodians of **PDT**s, managing the production, management and maintenance of a **PDT** on an assigned topic or group of topics.

*Note: Further description of **WHAT** an **RA WG** is described in* [LEXiCON Methodology: Creating Relevant Authorities and Achieving Consensus.]

A **WG** will be comprised of as minimum:

- **WG** lead
- **WG** technical author(s)
- **WG** members

A **WG** can additionally be comprised of:

- **WG** deputy lead
- **WG** secretary
- **WG** liaisons

The **RA** should identify how many members of a **WG** is quorate for all **WG**s. (**MUST**)

*Note: It is recommended three people as minimum quorate for **WG**'s.*

Once composed, the **WG** should demonstrate a holistic knowledge of the topic and an understanding of the information that different audiences of the **PDT** across the supply train want and do not want. (**MUST**)

The composition of the **WG** should be agreed between the **WG** Lead, the **RA** Chair and the **RA** Manager. (**MUST**)

To be assigned appropriate permissions, individuals joining the **WG** will already need to be registered users on the LEXiCON platform. (**MUST**)

4.4.2 WG lead

The **WG** lead acts as chair of the **WG**, and is responsible for

1. Chairing the **WG** for the production, management and maintenance of a **PDT** on an assigned topic (**MUST**)
2. Composing a **WG** that as far as practicable that is balanced, fair and demonstrates perspectives throughout the supply chain (**MUST**)
3. Assuring the consensus of the **WG** in the creation of the **PDT** (**MUST**)
4. Assuring the **PDT** is produced and maintained in a timely manner (**MUST**)

5. Assuring the quality control of the **PDT** (**MUST**)

The **WG** Lead shall be appointed in agreement by the **RA** manager and **RA** chair. (**MUST**)

As part of their application, the **WG** Lead shall supply a bio which, if successful, will be made publicly visible on the LEXiCON platform in association with the **PDT**. (**COULD**)

The permissions available to the **WG** have been described in Section 4.3.8

4.4.3 WG deputy lead (COULD)

The **WG** deputy lead shall act as a support the **WG** lead, either sharing the responsibilities of the **WG** lead or performing their role in their absence. (**MUST**)

The **WG** deputy lead shall be appointed in agreement by the **RA** manager and **RA** chair. (**MUST**)

As part of their application, the **WG** deputy lead shall supply a bio which, if successful, will be made publicly visible on the LEXiCON platform in association with the **PDT**. (**COULD**)

The **WG** deputy lead will have identical permissions to the **WG** lead but will be expected to use them in support of or in absence of the **WG** lead. (**MUST**)

4.4.4 WG secretary (COULD)

The **WG** secretary shall facilitate the administration duties of the **WG** under the instruction of the **WG** lead or **WG** deputy lead.

The **WG** secretary will have identical permissions to the **WG** lead, but will be expected to use them under instruction of the **WG** lead / **WG** deputy lead.

4.4.5 WG technical author(s) (MUST)

The **WG** technical author(s) is a **WG** member responsible for

1. The authoring and amending of the **PDT** as per the consensus of the **WG** (**MUST**)
2. The quality control of the **PDT** (**MUST**)
3. Contributing to the consensus view of the **WG** regarding the **PDT** (**MUST**)

There is no set limit to how many **WG** members can have **WG** technical author permissions, but it is recommended that the number of **WG** technical authors be kept minimal to maintain the consistency and quality control of the **PDT**.

WG technical authors will be appointed with agreement between the **WG** lead, the **RA** manager and the **RA** chair. (**MUST**)

WG technical authors will have the permissions to be able to:

1. Edit and comment on **PDT**s that have been assigned to them as per the consensus of the **WG** (**MUST**)
2. Create and edit properties and groups of properties (**MUST**)
3. Submit **PDT**s to LEXiCON Advisory group for quality checks (**MUST**)

4.4.6 WG members

The **WG** members are responsible for

1. Contributing to the consensus view of the **WG** in regards to the **PDT** (**MUST**)
2. The quality control of the **PDT** (**MUST**)
3. Be answerable to **RA** and public comment (**MUST**)
4. To be inclusive, open, ethical, neutral, trustworthy, supportive, value data driven, work for the common good and be independent of software or other commercial bias; (**MUST**)

There is no set limit on how many **WG** members may be in a **WG**, but it is recommended that the number of **WG** members be balanced so that there be enough to demonstrate holistic knowledge of the topic of the **PDT** from all areas of the supply chain, and not so many to overly stagnate production.

WG members shall be appointed with agreement between the **WG** lead, the **RA** manager and the **RA** chair. (**MUST**)

WG members have permissions to comment on **PDT**s that have been assigned to them to contribute to the consensus of the **WG** (**MUST**)

4.4.7 WG liaisons (COULD)

WG liaisons are members of other **WG**s, which may be from the same **RA** or other **RA**s. They may contribute as either **WG** members or observers. This is helpful to assure a joined up approach to **PDT** production and can demonstrate collaboration from and auditing perspective.

If a **WG** liaison is there to represent another **RA**, they are limited to representing the views of the **RA** and not their views where they are contrary to that of their **RA**. (**MUST**)

WG liaisons shall be appointed with agreement between the **WG** lead, the **RA** manager and the **RA** chair. (**MUST**)

WG liaisons have permissions to comment on **PDT**s that have been assigned to them to contribute to the consensus of the **WG** (**MUST**)

5 Template processes

Key Findings

- A LEXiCON Master Template has been produced including the relevant metadata for it.
- Recommended guidance for RAs.
- The LEXiCON process for creating Product Data Templates within the LEXiCON platform including the expected configuation.
- The LEXiCON process for creating Template properies.

This section covers the proposed LEXiCON template creation process, and the expected structure of a **PDT** that has gone through the LEXICON process. This part of the document will cover:

1. The format of the Master Template
2. The Utilisation of the Master Template
3. Guidance for **RA**s in the **PDT** creation process
4. A granular breakdown of the **PDT** creation process recommended in the Methodology document

The last two subsections provide process maps to give a holistic view of both the **PDT** and property creation workflows discussed in the previous subsections.

5.1 Master Template format

A master template has been developed by the group to standardise the structure which LEXiCON **PDT**s follow. The template can be divided into 2 main parts:

1. Template metadata/header – describes the template, its classifications, and other overarching metadata fields
2. Template body – contains the properties, groupings of properties and fields that define the individual properties

5.1.1 Template metadata

The template shall contain metadata including the definition of the **PDT** (e.g. topic and description), the provenance of the template contents (e.g. Relevant Authority and custodian), and other overarching **PDT** information (e.g. modified data and version). Each of the fields that will be available in the template have been listed in Appendix A (screenshot of the main metadata that is available can be seen in Figure 1). (**MUST**)

Product Data Sheet Topic	Doorset
Topic Description	Doorset as defined in BS EN 12519 - a complete unit consisting of a door frame and a door leaf or leaves, supplied with all essential parts from a SINGLE source
Template version	V1 0422
Template Stage	Consultation
Relevant Authority	Fenestration
Custodian Organisation	GAI
Date Last Modified:	2022-01-01T00:00:00

Figure 1 Example of **PDT** metadata within the completed master template (An illustrative Relevant Authority as an for the

completed fields)

5.1.2 Template body

Each of the **PDT** properties shall have accompanying fields that would assist the creators of the PDS to provide values/answers to each of the required properties. Each property shall have the following fields available:

1. Information Category – category that the property falls under (**MUST**)
2. Property Name – the name of the property (**MUST**)
3. Value/Answer – the value the PDS creator will have to provide (**MUST**)
4. Measure – type of measure (e.g. time, mass density, date measures) (**MUST**)
5. Units – specific unit that the value/answer shall be expected to be provided in (**MUST**)
6. Notes – Any supplementary notes such as relevant standards, property descriptions, or expected formats, that will help users provide a suitable value/answer (**MUST**)

Further fields are available to be filled in by users or shall be automatically populated ***WHEN*** a template is downloaded from the LEXiCON platform. (**MUST**)

Additional fields have been expanded upon in Appendix B.

Information Category	Property Name	Value/Answer	Measure	Units	Notes
Manufacturer Data	PDS Completion Date		DateMeasure	Date-YYYY-MM-DD_{0..1}	
Manufacturer Data	Manufacturer		TextMeasure	Label-openfield_{0..1}	ufacturer Name

Figure 2 Example of the basic property fields that will be available in the **PDT**

5.2 Master Template Utilisation

The Master Template has been designed with the expectation that it be utilised in at least two instances (refer to Section 5.4 for a detailed explanation of the processes):

1. During **PDT** development (**MUST**)
2. Downloading the **PDT** to develop the PDS (**MUST**)

Navigating the LEXiCON platform system to develop templates can be a steep learning curve for **WG** Leads, Technical Authors and **WG** members. Therefore, if users have existing **PDT**s they have developed, they will have the opportunity to upload them into the system. (**COULD**)

All system users will be encouraged to use the Master Template to format the **PDT**s they upload onto the system which will make it easier for technical authors within the **WG**s to check and upload the templates. (**COULD**)

All **WG** members will also be able to see the progress of templates as they are being developed by a **WG** as shown in Figure 3. If they require to download the **PDT**s midway through the process to comment and amend it offline, they would be able to do so via the LEXiCON platform. (**MUST**)

The **PDT** will be generally expected to be developed through the LEXiCON platform by authorised providers. This would provide the necessary constraints and information that will allow **WG**s to develop their **PDT**s following the defined data structure and defining properties consistently. The LEXiCON platform is being developed anticipating a combination of using the process of uploading standalone copies of templates from external sources, or created through LEXiCON platform interfaces.

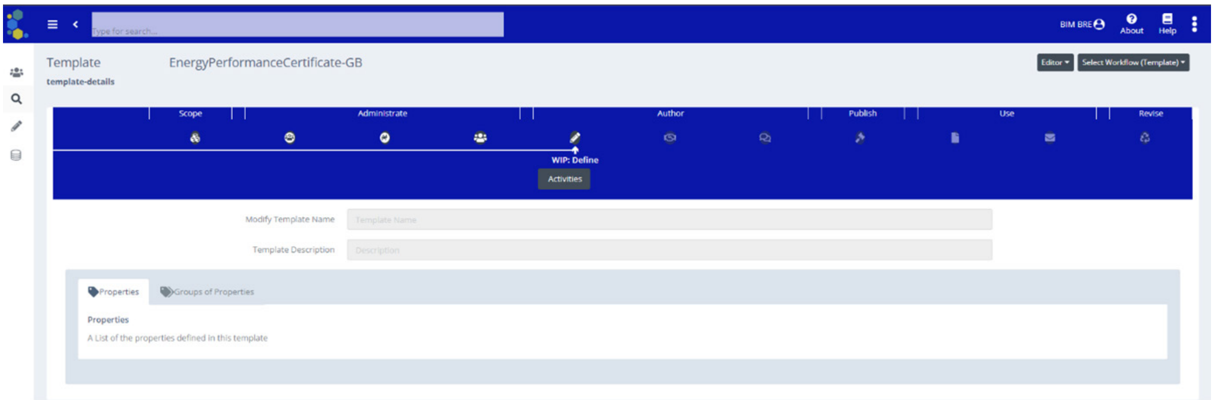


Figure 3 Template details page which highlights the stage of development of the template

The LEXiCON platform allows users to download **PDT**s they can view on the system. The next few subsections of this document will discuss when specific users can view **PDT**s. Section 6.7 discusses the various formats that the LEXiCON platform allows users to export the **PDT** to.

5.3 Guidance for RAs

It is recommended that there will be an advisory group that will be availble to **RA**s that will provide formal and informal guidance for templates and services, these could be in the form of documentation, literature, and user forums. These will be defined at a later stage as a part of the governance processes. **RA** members will have the opportunity to receive support to control the quality of the content within their **PDT**s. They will be allowed to push their queries to a forum that will consist of 'Askers' and 'Answerers'. An Asker can be any member of a **WG**, and Answerers will be a select group of technical experts ***WHO*** will be appointed by the LEXiCON Steering Group. Refer to Figure 4 for a highlevel guidance process that will be made available to users.

Figure 4 Support forum process

Note: This support may not necessarily be provided via the LEXiCON platform.

5.4 Template development

The process of creating templates has been described in the LEXiCON Methodology: Creating Relevant Authorities and Achieving Consensus. This section will describe the steps that Relevant Authorities will need to take from identifying a topic for a **PDT** all the way through to taking it through to publish. This section is limited to creating new **PDT**s and assumes that there is already a registered **RA** in place.

The stages of this process covered will be:

1. Identify topic
2. Assign **WG**
3. Identify interested parties
4. Create **PDT**
5. Consult
6. Publish
7. Review

5.4.1 Identify topic

The method of identifying the topic has been described in LEXiCON Methodology: Creating Relevant Authorities and Achieving Consensus. The following process assumes that an **RA** has been assigned and that they have approved the commencement of creating a **PDT** on the identified topic.

- **RA** posts **PDT** topic proposal on the LEXiCON Platform (**MUST**).
- This will initiate the stage '**WG** Formation' (**MUST**)
- The LEXiCON platform creates a **PDT** draft, derived from the Master Template (**MUST**)
- The LEXiCON platform populates **PDT** draft describing the topic with the following:
  - Title (**MUST**)
  - Description (**SHOULD**)
  - Classification (**COULD**)

  Note: The classification is not a must as not all topics will have a clear classification, but where possible it would be recommended.
- The below table shows associated information that will describe the PDT and its progress path (**MUST**)

Stage	WG Formation		
State	Draft	Status	WG Formation
Visibility Status	Visible - all	Action Status	Not editable
Comment visibility Status	n/a		

- Notification period
  - The PDT topic proposal shall remain static, and notice shall be given that work on it will commence in at least two weeks' time. (**MUST**)
  - Notification to be sent to everyone WHO is following the RA. (**MUST**)
  - Notification to be sent to all other RAs. (**MUST**)

- Notification to be sent to all appropriate BSI Committees. (**COULD**)
- Within the LEXiCON platform shall be a dashboard for all proposed PDTs visible to all users and with the option to register interest available to all registered users (**MUST**)

- **RA** assigns **WG** lead on the LEXiCON platform. (**MUST**)
- **RA** identifies **WG** deputy lead assigns **WG** deputy lead[1] permissions on the LEXiCON platform. (**COULD**)
- **RA** assigns **WG** secretary[2]. (**COULD**)

5.4.2 Assign WG

- **WG** lead records bio on LEXiCON tool available for the **RA** and **WG** members to view. (**SHOULD**)
- **WG** lead identifies candidates for **WG** members from within the **RA** (**MUST**).
- **WG** lead assess the competence of those joining the group on a dynamic basis (**MUST**)
- Assign **WG** member permissions to **WG** members (**MUST**).
- **WG** members upload their bio on a voluntary basis (**COULD**).
- **WG** lead identifies **WG** technical author(s)[3]. (**MUST**)
- Assign **WG** technical author(s) permissions. (**MUST**)

5.4.3 Identify interested parties

- Once the **WG** lead has identified persons within their **RA**, other interested parties should be identified. (**MUST**)
- **WG** lead may identify candidates from:

  From the internal LEXiCON platform

  - Registered users ***WHO*** have registered interest in the WG (**COULD**)
  - WG members from other WGs from in the same RAs (**COULD**)
  - Members from other RAs (**COULD**)

  External to the platform

  - BSI committee members (**COULD**)
  - Stakeholders otherwise identified by the RA or WG (**COULD**)

  Note: though interested parties may be identified from outside the LEXiCON platform, to participate in the ***WG*** *they will have to become a registered user.*

- Permissions for **WG** members, **WG** technical authors and **WG** liaisons assigned as appropriate. (**MUST**)
- Once **WG** members are agreed, the **WG** lead will commence **PDT** editing. The LEXiCON platform then releases the **PDT** for the **WG** to work on. The stage and **PDT** status changes to 'WIP' (work in progress). The visibility of the **PDT** will change to only visible by the **WG**, and editability will change so that only the **WG** can edit or comment on it.

---

1 WG deputy lead can be assigned or reassigned any time during the formation and running of the WG

2 WG secretary can be assigned or reassigned any time during the formation and running of the WG

3 WG technical author(s) may be identified both from WG members initially drawn from the RA and interested parties, and may be assigned or reassigned at any time during the formation and running of the WG

- The below table shows associated information that will describe the PDT and its progress path (**MUST**):

Stage	WIP		
State	Draft	Status	WIP
Visibility Status	Visible - WG Only	Action Status	Edit and Comment
Comment visibility Status	Comments visible – WG only		

5.4.4 Create PDT (initial draft)

- The **WG** should begin with the master template. (**MUST**)
- Options of where the **PDT** might sit whilst being edited:
  - o Within the LEXiCON platform (**MUST**)
  - o Downloadable excel master template that can be imported again (**COULD**)

    *Note 1: need to explore **WHAT** functions the LEXiCON platform could have to do the above. May be that there is only one option in the first instance.*

    *Note 2: Downloading excel template makes it very accessible to those **WHO** are not so computer savvy, **HOW** ever it does mean there may be some human error causing deviation from existing properties which would need to be resolved*
- For existing properties and groups of properties which could be utilised, the **WG** should refer to the master database within the LEXiCON TEMPLATER. (**MUST**)
- New properties and group of properties should only be created where necessary. (**MUST**)
- Property and group of properties naming should be logical and easily understandable. (**MUST**)

In creating the **PDT**, the **WG** should consider the following:

- Do not be afraid to ask questions of the LEXiCON Advisory Group.
- The first draft does not have to be right first time
- Make sure all properties are relevant to the consumers of the data
- Make sure all properties can be answered by the suppliers of the data
- Make sure all properties are relevant to the topic
- Make sure properties and descriptions are adequately intuitive to generate the right response (ask in plain language)
- General consensus (as defined in PAS 14191:2020) from the **WG** should be sought.

5.4.5 Create PDT (upload and submit draft to RA)

- If the **PDT** was developed outside of the LEXiCON platform **WG** Lead (or delegated **WG** member) to upload draft and as required reconcile properties with LEXiCON data dictionary. (**MUST**)
- **WG** Lead (or **WG** Deputy Lead / **WG** Secretary) should submit the draft to the **RA** for review.

- The below table shows associated information that will describe the **PDT** and its progress path (**MUST**) :

Stage	WIP		
State	Draft	Status	Shared - Host RA
Visibility Status	Visible - Host **RA** and **WG** Only	Action Status	Not editable accept comment
Comment Visibility Status	Comments visible – **WG** only		

- **RA** members to be notified of **PDT** draft available for **RA** review by the LEXiCON platform . (**MUST**)
- Apply timescale for **RA** review and comment. (**MUST**)

  NOTE: The timescale for review and comment should be set by the ***RA*** *as part of their Ts & Cs (suggest between 1 and 3 months)*
- Once the review period has closed, the **RA** shall return the **PDT** to the **WG** for comment resolution.
- The below table shows associated information that will describe the PDT and its progress path: (**MUST**)

Stage	WIP		
State	Draft	Status	WIP
Visibility Status	Visible - **WG** Only	Action Status	Editable and comment
Comment Visibility Status	Comments visible – **WG** only		

- The **WG** should commence comment resolution of **RA** comments. (**MUST**)

  NOTE: The timescale for comment resolution should be set by the ***RA*** *as part of their Ts & Cs (suggest between 1 and 3 months)*
- The **WG** may resubmit the **PDT** for **RA** additional review should it be deemed necessary either by the **RA** or the **WG**. (**COULD**)

5.4.6 Consult (submit for public comment)

- Once the **WG** and **RA** deem the **PDT** appropriately developed, the **WG** Lead (or **WG** Deputy Lead or **WG** Secretary as appropriate) should submit the **PDT** for public comment. (**MUST**)
- The below table shows associated information that will describe the PDT and its progress path: (**MUST**)

Stage	Public Consultation		
State	Draft	Status	Shared - Public
Visibility Status	Visible - Registrer User Only	Action Status	Not Editable and accept comment
Comment Visibility Status	Comments visible – **WG** only		

- Notification will be sent to:
  - All **RA**s (MUST)
  - All registered users following **PDT**s home **RA** or **WG** (**MUST**)
  - All interested parties of the **PDT** (**MUST**)

- Appropriate BSI committees (**COULD**)
- Any party the **RA** deems may be interested in the **PDT**. (**COULD**)

- Within the LEXiCON platform shall be a dashboard for all **PDT**s at public comment stage visible to all users. (**MUST**)
- To comment, a user must be registered. (**MUST**)
- To comment on behalf of an organisation, a registered user must be authorised as part of that organisation. (**MUST**)
- Comments must be submitted via the LEXiCON platform comment template.
- For a comment to be valid it must include the registered user ID, identify both the problem and a suggested solution or change.
- Comments during public consultation will be visible to other registered commenters. (**SHOULD**)
- The consultation period should be at least one month. (**MUST**)

5.4.7 Consult (public comment resolution)

- Once the public comment period is concluded, the **WG** shall close the consultation. (**MUST**)
- The below table shows associated information that will describe the PDT and its progress path: (**MUST**)

Stage	WIP		
State	Draft	Status	WIP
Visibility Status	Visible - **WG** Only	Action Status	Edit and comment
Comment Visibility Status	Comments visible – **WG** only		

- All valid comments must be addressed and justification given for the resolution. (**MUST**)

NOTE: The timescale for comment resolution should be set by the **RA** as part of their Ts & Cs (suggest between 1 and 3 months)

5.4.8 Publish - Approve for publication

- Once the comment resolution period is completed, the **WG** should agree via consensus that the **PDT** is ready for publication. (**MUST**)
- The **WG** lead should then submit the completed **PDT** to the **RA** as ready for publish. (**MUST**)
- The below table shows associated information that will describe the PDT and its progress path: (**MUST**)

Stage	WIP		
State	Draft Awaiting publish approval	Status	Shared – Host RA
Visibility Status	Visible - **RA** and **WG** Only	Action Status	Edit and comment
Comment Visibility Status	Comments visible – **WG** only		

- At the **RA**'s discretion, the **RA** shall conduct final review and publish the **PDT**. (**MUST**)
- The below table shows associated information that will describe the PDT and its progress path should the RA resolve to publish: (**MUST**)

Stage	Published - Current		
State	Published	Status	Current
Visibility Status	Visible - **all**	Action Status	Not Editable
Comment Visibility Status	Comments visible – **RA** and **WG** only		

- Notification of the published **PDT** will be sent to:
  - All registered users **WHO** are following the **RA** (**SHOULD**)
  - All registered users **WHO** have registered interest on the **WG** (**MUST**)
  - To the appropriate BSI committees (**COULD**)
  - Any stakeholders the **RA** have deemed appropriate (**COULD**)
- The **PDT** and the properties within will be viewable by all users (both guest and registered), and the **PDT** will be downloadable by all registered users. (**MUST**)

5.4.9 Review – feedback from registered users

- Once published registered users may comment on the **PDT** and / or its properties at any time for the review of the **WG**. (**MUST**)
- For a comment to be valid it must include the registered user ID, identify both the problem and a suggested solution or change. (**MUST**)
- Comments will be graded once by the registered user and then counter graded by the **WG**. The purpose of the registered user to grade the comments it to assist the **WG** in understanding the priority of the issue. The purpose of the **WG** counter-grading the comment is to determine whether the comment will inspire review of the **PDT** prior to the periodic review. (**SHOULD**)
- Comments should be graded by the registered user into the following categories:
  a. Critical – seriously compromises the use of the **PDT** (**SHOULD**)
  b. Important – may affect the ability to create a useable PDS (**SHOULD**)
  c. Useful – may improve the usability of the **PDT** / PDS or future versions. (**SHOULD**)
- The commenter should give justification for the grading of their comment (**SHOULD**)
- Upon submission of these comments, the comments will not be publicly viewable, and will be visible only to the **WG** and the **RA**. (**MUST**)
- Notification of a new comment will be sent to the **WG** lead, and the **WG** deputy lead and **WG** secretary if assigned. (**MUST**)
- Comments shall be viewable by the **RA** and the **WG**. (**MUST**)
- Review of comments will be at the discretion of the **WG** (**MUST**), although the **RA** may stipulate in their t's and c's minimum periodic review. (**SHOULD**)
- These comments should be reviewed by the **WG** and counter graded into the following categories:
  a. Critical – seriously compromises the use of the **PDT** (**SHOULD**)
  b. Important – may affect the ability to create a useable PDS (**SHOULD**)
  c. Useful – may improve the usability of the **PDT** / PDS or future versions. (**SHOULD**)
  d. Not applicable – comment does not justify a change (**SHOULD**)
- Comments that are deemed critical by the **WG** should inspire an immediate review of the **PDT**. (**SHOULD**)

- Comments that are deemed important may inspire an immediate review at the discretion of the **WG** or **RA**, particularly if there are multiple important comments. They may also be retained for the next periodic review of the **PDT**. (**SHOULD**)
- Comments that are deemed useful will be retained for the next periodic review of the **PDT**. (**SHOULD**)
- Comments that are not applicable may be closed. (**SHOULD**)
- The **WG** should give justification for the grading of the comments. (**SHOULD**)
- Feedback on the counter-grade designated by the **WG** and any further actions may be available to the commenter on request. (**SHOULD**)
- Comments that are deemed useful should be retained for the next periodic review of the **PDT**. (**SHOULD**)
- Should a review be deemed necessary, the **WG** Lead shall change the status of the **PDT** to 'Current, - under review'. (**SHOULD**) The below table shows associated information that will describe the PDT and its progress path:

Stage	Published - Current		
State	Published	Status	Current - under review
Visibility Status	Visible - **all**	Action Status	Not Editable
Comment Visibility Status	Comments visible – **RA** and **WG** only		

- A review may result in no changes being deemed necessary or that they can be retained for the next periodic review, if that is the case the **WG** Lead shall revert the status of the **PDT** back to 'Current'. (**SHOULD**)

Stage	Published - Current		
State	Published	Status	Current
Visibility Status	Visible - **all**	Action Status	Not Editable
Comment Visibility Status	Comments visible – **RA** and **WG** only		

- Alternatively the review may result in a decision that a new version or new **PDT** is required. If this is the case, the WG lead should identify the stage for the **PDT** as 'Published – current, due to be superseded' until the **PDT** is ready to be archived. (**MUST**)

Stage	Published - Current		
State	Published	Status	Current, due to be superseded
Visibility Status	Visible - **all**	Action Status	Not Editable
Comment Visibility Status	Comments visible – **RA** and **WG** only		

- When the **PDT** is replaced by a new version or PDT, the **RA** shall archive the superseded on. The below table shows associated information that will describe the **PDT** and its progress path: (**MUST**)

Stage	Published - Current		
State	Decommissioned	Status	Decommissioned
Visibility Status	Visible - **all**	Action Status	Not Editable
Comment Visibility Status	n/a		

5.4.10 Review – periodic review

- **PDT** shall be reviewed by the **WG** at a period identified by the **RA** which shall be no longer than two years. (**MUST**)
- A notification should be sent to the **WG** Lead two months prior to the agreed periodic review date to remind them to initiate the review. (**COULD**)
- The **WG** Lead shall change the stage of the **PDT** to 'Current, under review'. (**MUST**) The below table shows associated information that will describe the PDT and its progress path: (**SHOULD**)

Stage	Published - Current		
State	Published	Status	Current - Under Review
Visibility Status	Visible - **all**	Action Status	Not Editable
Comment Visibility Status	Comments visible – **RA** and **WG** only		

- A review may result in no changes being deemed necessary or that they can be retained for the next periodic review, if that is the case the **WG** Lead shall revert the stage of the **PDT** back to 'Published'. (**SHOULD**)

Stage	Published - Current		
State	Published	Status	Current, due to be superseded
Visibility Status	Visible - **all**	Action Status	Not Editable
Comment Visibility Status	Comments visible – **RA** and **WG** only		

- -Alternatively the review may result in a decision that a new version or new **PDT** is required. If this is the case, the **WG** lead should identify the stage for the **PDT** as 'Published – current, due to be superseded' until the PDT is ready to be archived. (**MUST**)
- When the **PDT** is replaced by a new version or **PDT** the **RA** shall archive the superseded on. The below table shows associated information that will describe the PDT and its progress path: (**MUST**)

Stage	Superseded		
State	Decommissioned	Status	Decommissioned
Visibility Status	Visible - **all**	Action Status	Not Editable
Comment Visibility Status	n/a		

5.4.11 Template development process

This section provides workflow diagrams based on what has been discussed earlier in the section. Each of the separate tasks will have information above them including the stage, visibility and editability of the entity at each point of the process which will help organisations set up the LEXICON process on their own data dictionaries if needed. The overall process map can be found in Appendix D.

Stages advise key milestones of a PDT to be communicated publicly. The available stages of a PDT are:

Stage	Notes
WG Formation	
WIP	(work in progress)
Public consultation	

Published - current	
Published – current, due to be superseded	The **RA** has identified that the **PDT** requires amending. The **PDT** remains current until being superseded. **RA**s may wish to identify a date when the **PDT** is due to be superseded.
Superseded	The **PDT** has been decommissioned and replaced by a new version or **PDT**
Archived	The **PDT** has been decommissioned and has not been replaced by a new version or **PDT**
On hold	Work on the **PDT** has been paused (NOTE: this can be regarded as a temporary stage or a status on a current state as indicated below, the key point is that this is what is communicated publicly as a stage when a template is on hold)

The state of a **PDT** communicates how the **PDT**should be considered and is communicated as appropriate to whomever the **PDT** is shared with. The status of a **PDT** identifies the sub-milestones, viewable internally to the **RA** and its **WG**s.

The available states and statuses' of a **PDT** are:

State	Status	Notes	Active / Inactive
Draft	WG formation		Inactive
Draft	WIP	(work in progress)	Inactive
Draft	Shared – Host **RA**	Draft is shared with the RA that the WG answers to	Inactive
Draft	Shared – Host **RA** and other **RA**s	Draft is shared with RA that the WG answers to and other RAs deemed appropriate to be consulted prior to public consultation.	Inactive
Draft	Shared – Public	Available to be viewed with broad information by public, and fully viewed and commented by registered users for public consultation	Inactive
Draft	On hold	Work on the PDT has been paused	Inactive

Draft -	Awaiting publish approval	This denotes particularly that the WG consider the PDT to be fully resolved and require RA sign off. The RA may chose to either publish or return with further comments.	Inactive
Published	Current		Active
Published	Current – under review	The RA / WG reviews the PDT e.g. identifying whether or not the PDT should be amended.	Active
Decommissioned	Decommissioned	PDT has been retracted due its being replaced by a revised version or different PDT	Inactive
Cancelled	Cancelled	PDT production has been cancelled pre-publication as per the decision of the **RA** e.g. the product has been removed from market.	Inactive

The action status's of a PDT identify key actions for the goal of producing templates.

The edibility status's of a PDT are:

Action status	Notes
Not editable	e.g. the PDT will not be editable whilst notice of the PDT is given, or when it is published
Edit and comment	
Not editable and comment	

The visibility status refers to viewing the content of the **PDT**.

Note: Broad information about the **PDT** may be communicated publicly to registered and unregistered users.

The available visibility statuses of a **PDT** are:

Visibility Status	Notes
Visible – all	
Visible – registered users only	Registered users include the **WG** and **RA**
Visible – WG only	
Visible – Host **RA** and **WG** only	
Visible – Host **RA**, **WG** and other **RA**s only	**PDT** is made visible to elected **RA**s as part of collaboration
Visible – Host **RA** Chair and **RA** Manager only	**PDT** is visible to **RA** Chair and **RA** Manager only (prior to **WG** formation or notification)

The comment visibility status's of a PDT are:

Comment visibility status	Notes
Comments visible – all	e.g. during public consultation process comments will be visible to registered users, RA and WG
Comments visible – WG and RA only	
Comments visible – WG only	e.g. whilst WG is first drafting PDTs, comments will be limited to WG view only
Comments visible – RA only	e.g. whilst RA's are reviewing, comments will be limited to RA view only

This section provides workflow diagrams based on what has been discussed earlier in the section. Each of the separate tasks will have information above them including the stage, visibility and editability of the entity at each point of the process which will help organisations set up the LEXICON process on their own data dictionaries if needed. The overall process map can be found in Appendix D.

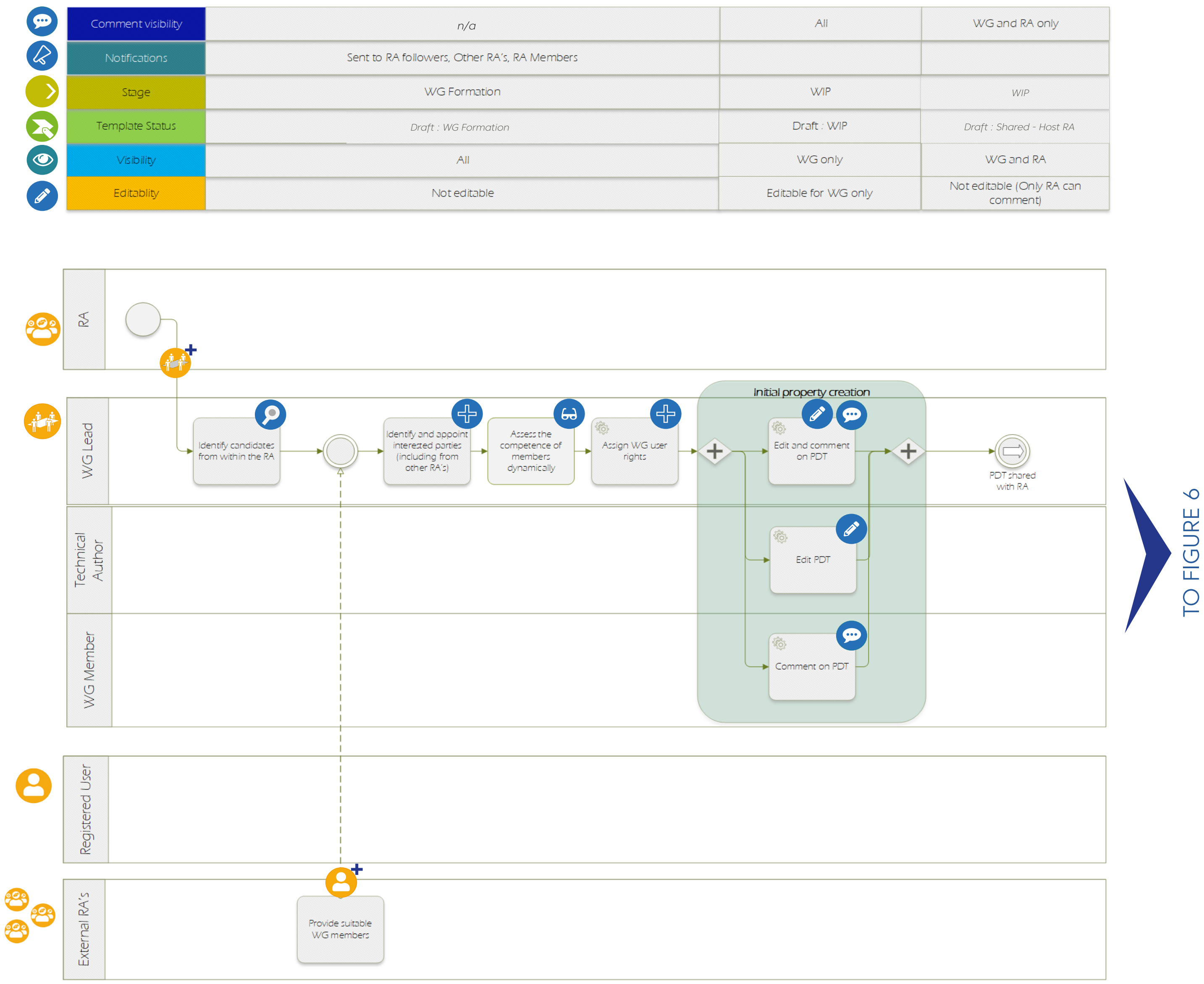
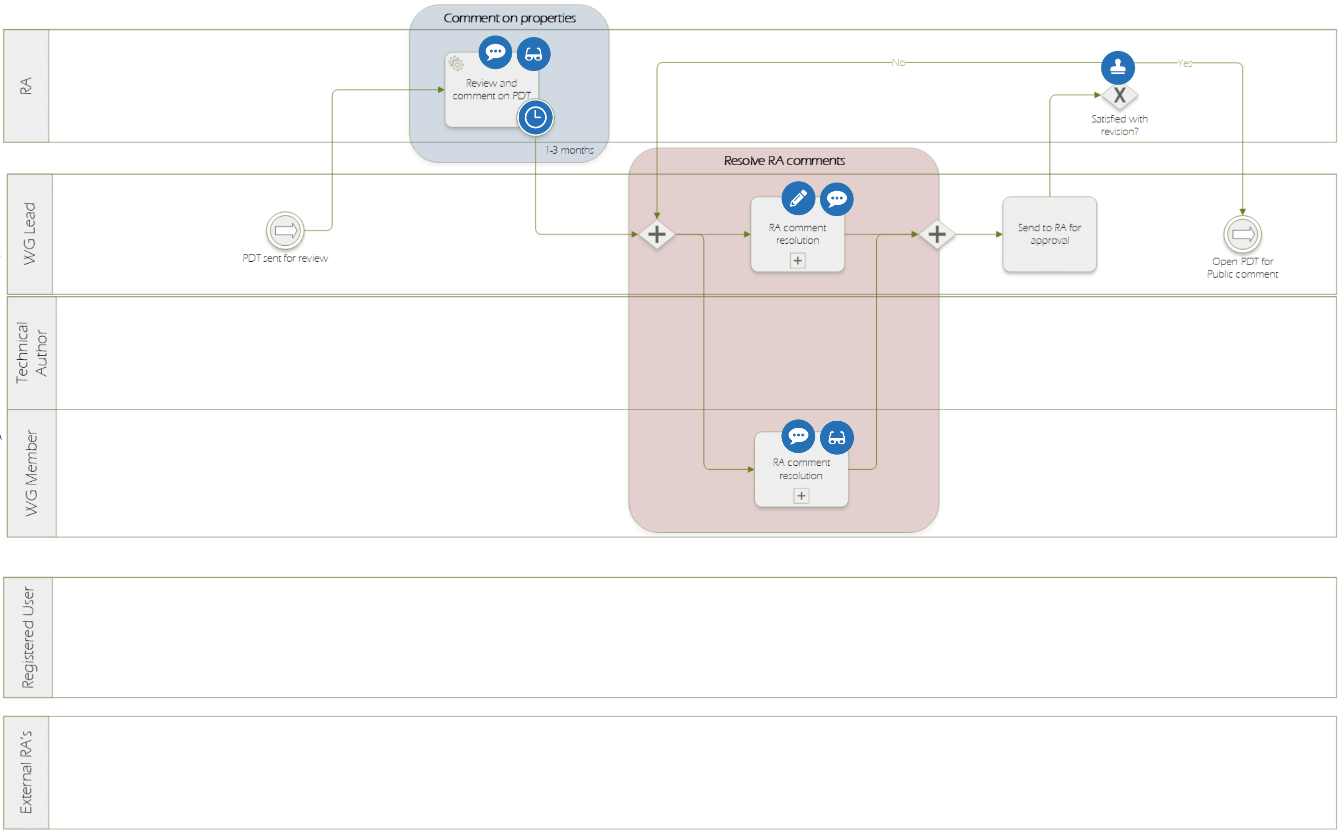


Figure 5 High level template creation process (Stage, Status, Visibility editability of templates) – Create and review PDT internally – Part 1 (System setup can be found in Section 6.2.2.1)

Comment visibility	All	WG and RA only	WG only	All (including unregistered)
Notifications				All RAs, Registered User following PDT, PDT IP
Stage	WIP	*WIP*	WIP	*Public Consultation*
Template Status	Draft : WIP	*Draft : Shared - Host RA*	Draft : WIP	*Draft : Shared - Public*
Visibility	WG only	WG and RA	WG only	Registered users
Editablity	Editable for WG only	Not editable (Only RA can comment)	Editable for WG only	Not edible

TO FIGURE 5



TO FIGURE 7

Figure 6 High level template creation process (Stage, Status, Visibility editability of templates) – Part 2 (System setup can be found in Section 6.2.2.2)

Comment visibility	All (including unregistered)	WG only	WG and RA only
Notifications	All RAs, Registered User following PDT, PDT IP		
Stage	*Public Consultation*	WIP	WIP
Template Status	*Draft : Shared - Public*	Draft : WIP	*Draft Awaiting publish approval : Shared - Host RA*
Visiblity	Registered users	WG only	WG and RA
Editablity	Not edible	Editable for WG only	Not editable (Only RA can comment or send for publication)

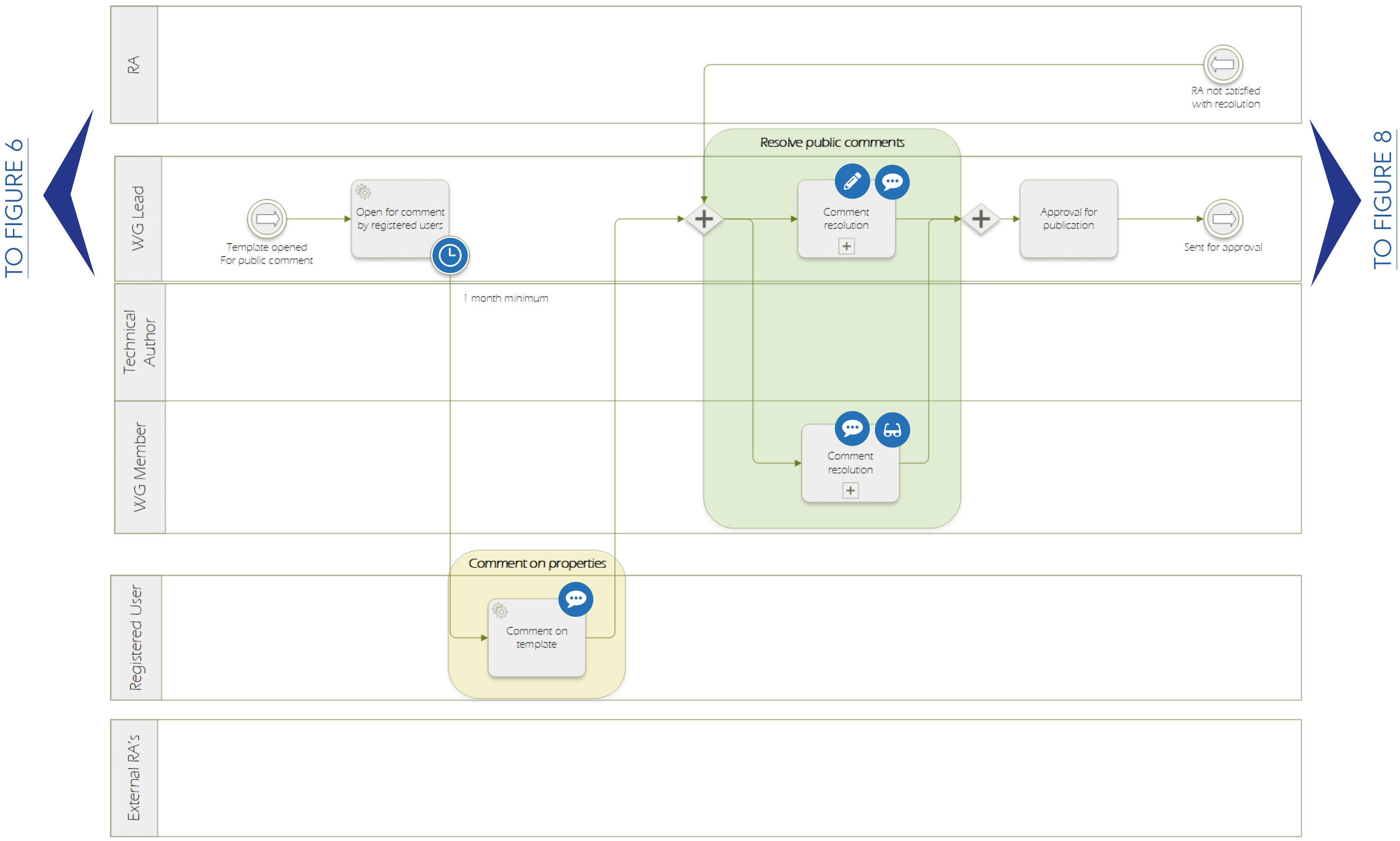


Figure 7 High level template creation process (Stage, Status, Visibility editability of templates) – Part 3 (System setup can be found in Section 6.2.2.3)

Comment visibility	WG and RA only	All	WG only	WG only
Notifications				
Stage	WIP	Public Shared	Public Shared	Public Shared/Archived/On hold
Template Status	RA approval	Published - Current	Published – Current, Under Review	Published – Current, to be superseded/ Decommissioned/Cancelled
Visibility	WG and RA	Visible to all users/downloadable for registered users	WG only	Visible to all users/downloadable for registered users
Editability	Not editable (Only RA can comment or send for publication)	Not edible / Open for comment	Editable for WG only	Not edible

TO FIGURE 7

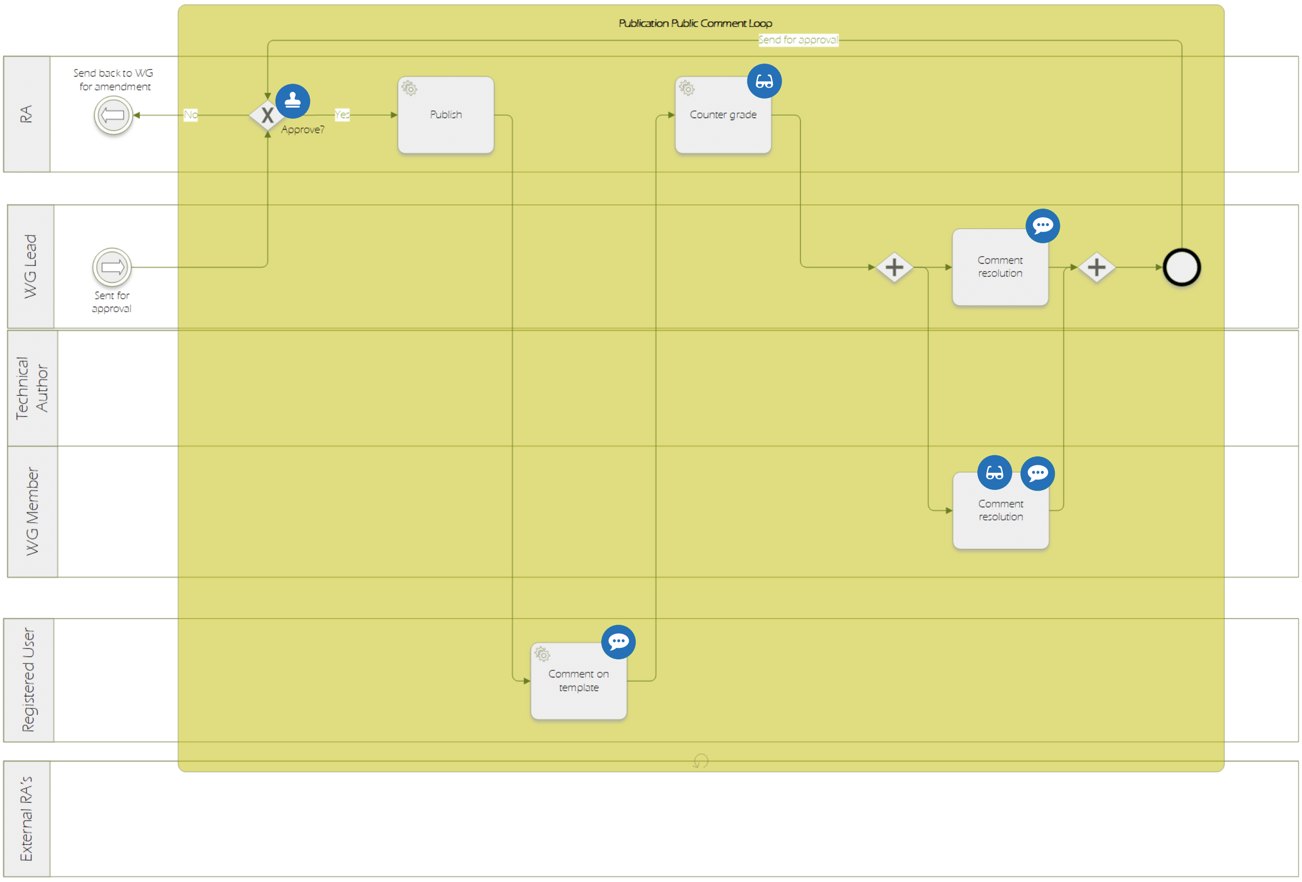


Figure 8 High level template creation process (Stage, Status, Visibility editability of templates) – Part 4 (System setup can be found in Section 6.2.2.4)

Status' to show that a **PDT** is "On Hold" or that it is "Cancelled" (cancelled is for products that are no longer to be manufactured

5.5 Property development

The creation of template properties shall occur in parallel with the creation of the overall template. This process was developed to test the system but will be refined further based on the outcomes of future testing. As the property creation process shall be expected to occur in unison with the process described in Section 5.4.11, the diagrams have been highlighted in matching colours to indicate that the processes in this section are subprocesses of the template creation process.

Throughout the development process a quality control group shall be expected to be available to help **WG**s with the development of the properties so that they meet the required standard.

NOTE: This process is under development and is subject to change

5.5.1 Draft template properties

The process of developing the properties within a template shall commence at the template property creation stage highlighted in (Figure 5). The template itself shall have a status of Work in Progress, and the properties will have the same status where they will only be visible to members within the **WG**. There shall be a triaging process of either creating or using existing properties, and an opportunity for members to upload any relevant existing **PDT**s that they own which then can be used as a starting point (Figure 9).

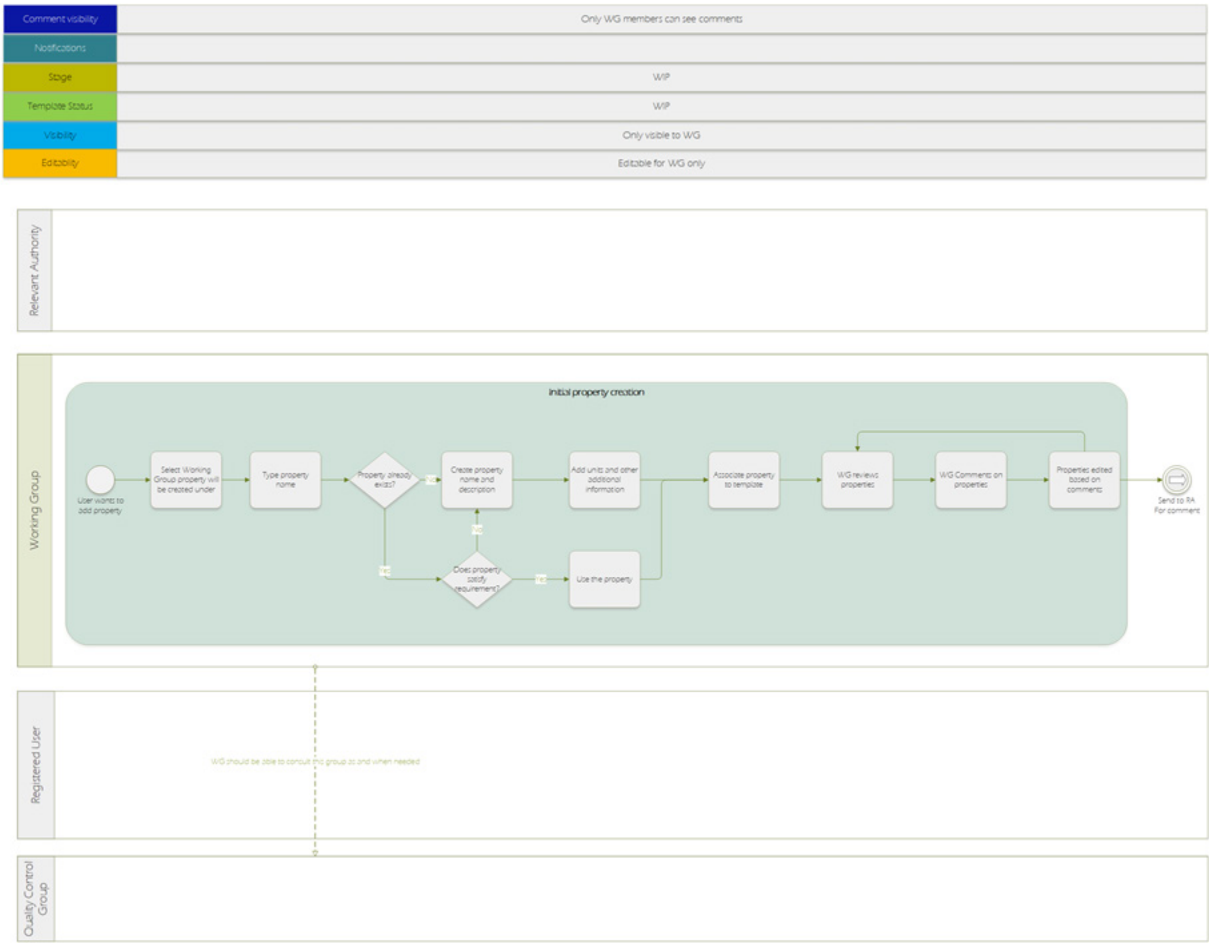


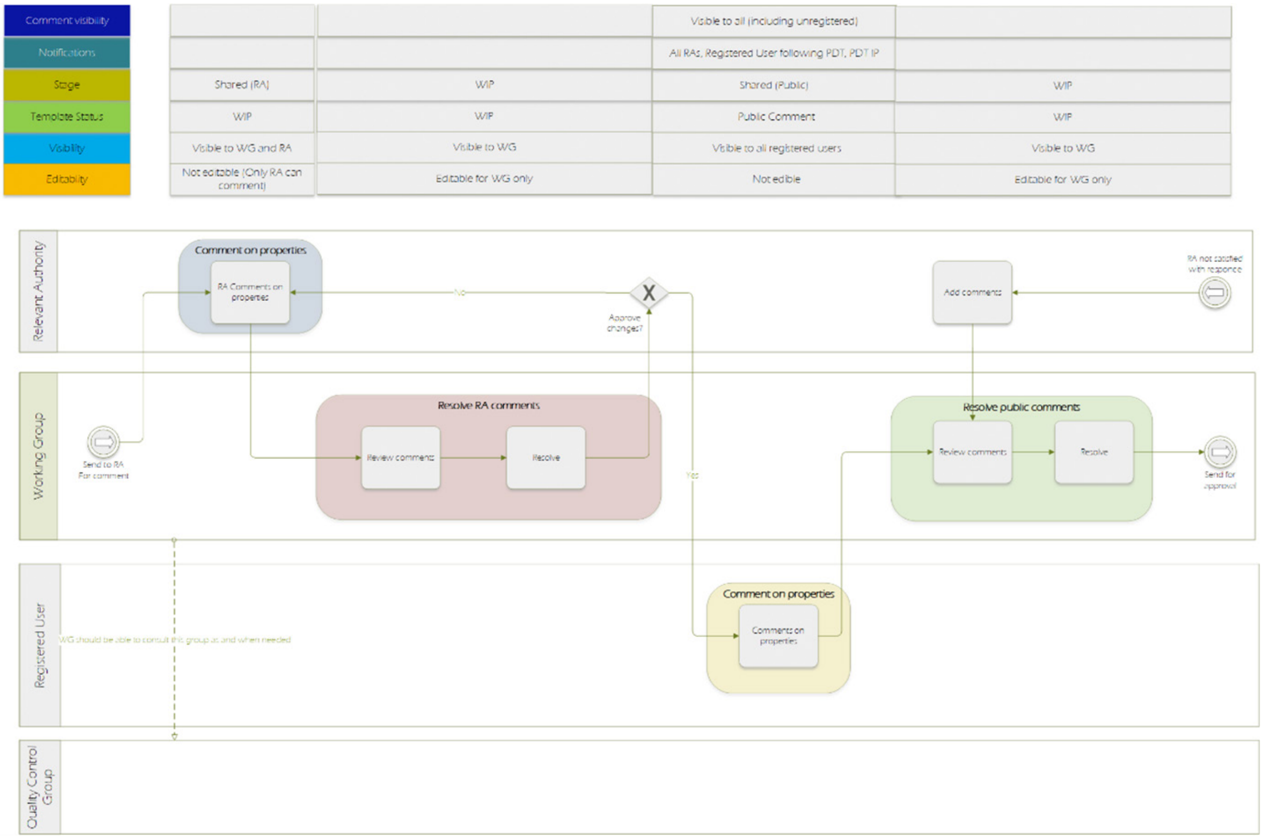
Figure 9 Creation of initial draft properties for a specific **PDT** (System setup can be found in Section 6.2.2.1)

TO FIGURE 10

5.5.2 Internal and external review

Following the development of the initial template properties, the template shall first go through an internal review cycle with the **RA** (Figure 6) and then a public review process (Figure 7). First the necessity of the properties, and then the contents of the properties of them shall be expected to be reviewed and commented on prior to the **RA** approving the template to be sent out for publication as illustrated in Figure 10.

TO FIGURE 9



TO FIGURE 11

Figure 10 Internal and public review process (System setup can be found in Section 6.2.2.2

5.5.3 Publication

The review **PDT** then shall go through a final approval process by the **RA** prior to being made available to the public. The properties shall be expected to be reviewed and go through further publication loops in parallel to the process described in (Figure 8). The **RA** shall be expected to review the **PDT**s and their properties, and send any feedback to the **WG** prior to republishing the **PDT** (Figure 11).

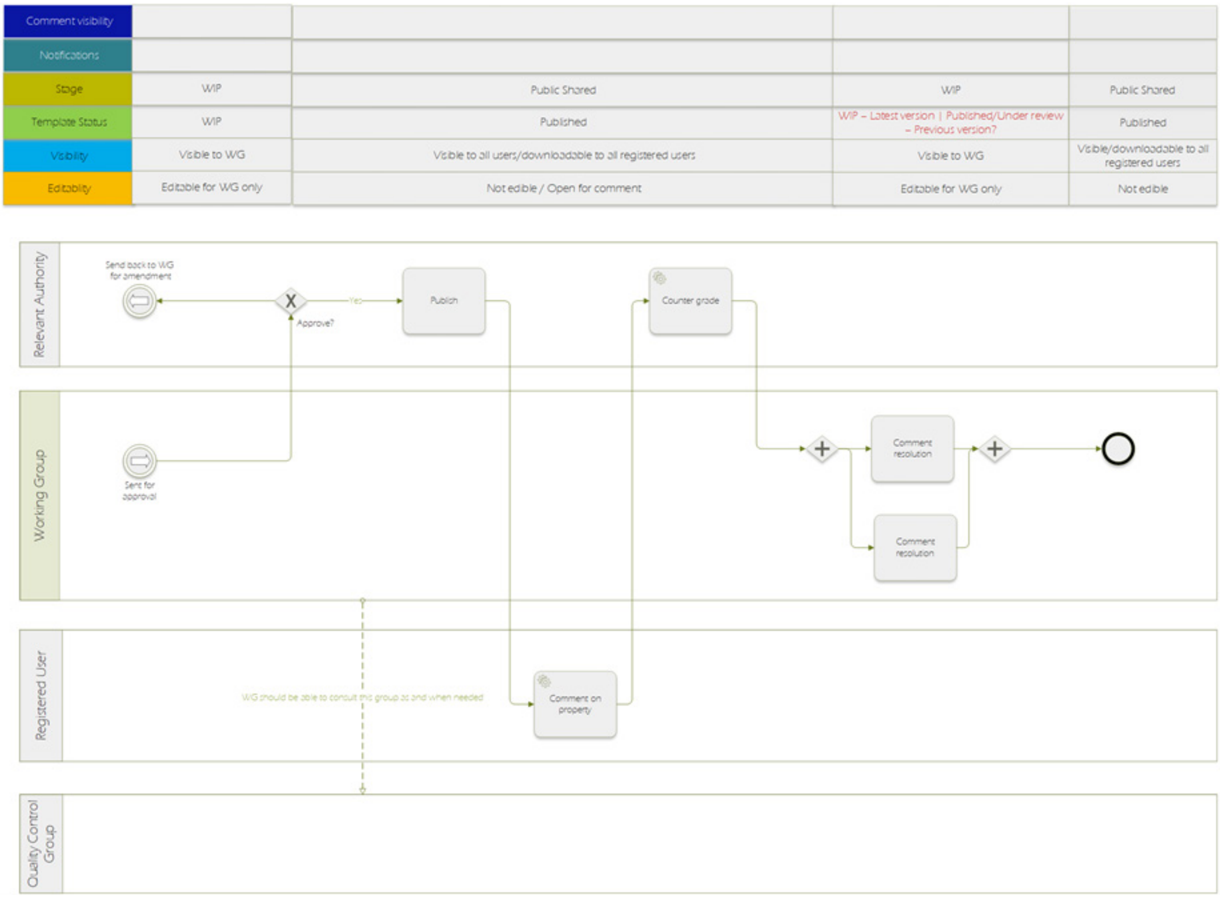


Figure 11 Publication of template and review of properties (System setup can be found in Section 6.2.2.3 and Section 6.2.2.4)

TO FIGURE 10

6 LEXiCON MVP Platform

Key Findings

- A Service FIrst approach was used to develop the Minimum Viable Product (MVP) data dictionary solution
- Registration process has been configured within the LEXiCON MVP platform
- Template creation process has been configured within the LEXiCON MVP platform
- A tool to discover interconnected dictionaries, RAs, WGs and PDTs has been proposed
- The LEXiCON MVP platform can export PDTs in multiple formats

The Hub has worked with the LEXiCON Working Group to understand ***HOW*** the specifics of LEXiCON might impact the kind of support data dictionaries need to provide. One of the primary considerations has been around the model of providing service. A number of data dictionaries such as Building Smart Data Dictionary declares itself as a service first approach. This primarily means that the Application Protocol Interface takes priority over Graphical User Interface and the actions that are performed in the GUI are also achievable through API.

The benefits of such an approach are that the Graphical User Interface development is not limited to web browser-based offerings, and it opens opportunities for utilising already familiar interfaces to potentially tap into certain parts of the services provided for what is appropriate to the application. This would be applicable to both accessing the definition creation side of the services as well as the definition consumption side of services.

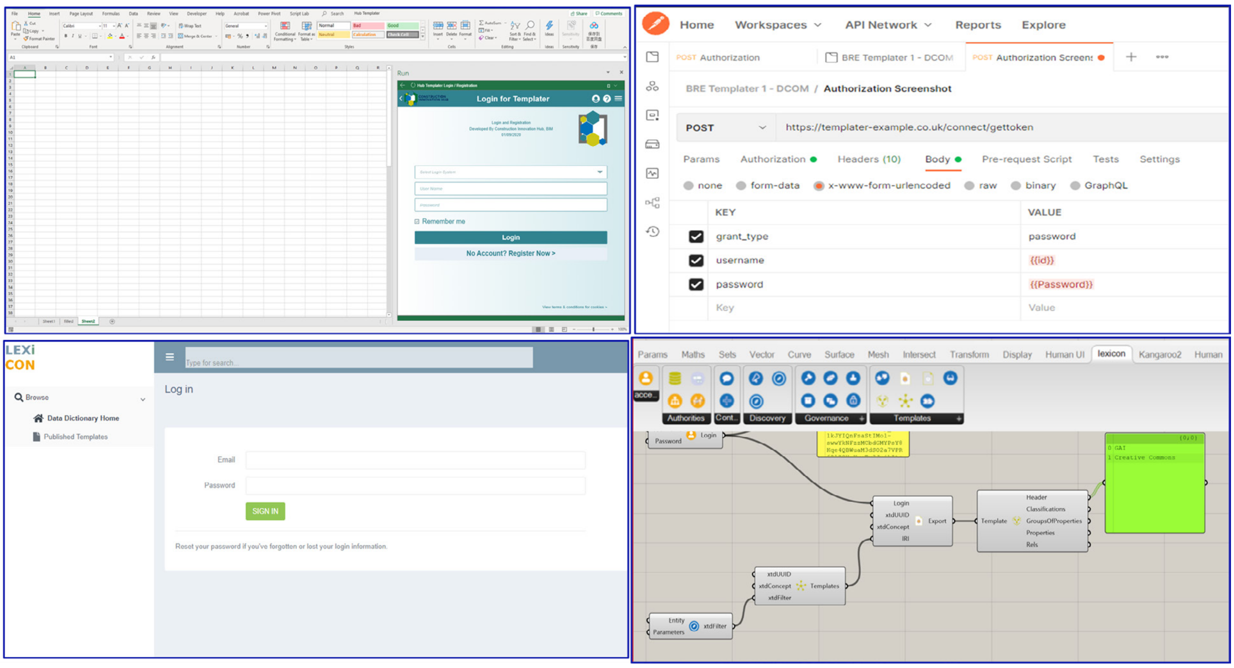


Figure 12 Examples of graphical user interfaces accessing the LEXiCON services (top left: Excel Web Add-in, Top right: Postman API, Bottom left:Web Browser user interface, bottom right: Grasshopper Components)

A service first approach will also enable for there to be the opening up of several data dictionary solutions to be able to be LEXiCON service providers so long as they support the specific LEXiCON processes and protocols for communicating with the system hosting LEXiCON. This model could then enable Relevant

Authorities to select a provider which would follow the spirit of competition. It also means there is more flexibility for LEXiCON itself to choose its hosting provider so long as that provider can meet specifications that aren't explicit from ISO 12006-3, 23386, 23387 and 14191.

The prototype of these concepts (particularly around capturing processes) that are developed under the Hub is a demonstrator and the specifics for interconnection by prospective LEXiCON service providers will need to be developed further. These are decisions that the LEXiCON Board will need to make once fully established.

The output of the current phase of the work has highlighted some of the features that have been developed in a data dictionary services, and these are the kinds of services that need to be mimicked in a LEXiCON service provider model. Some of these features will be exclusive to the LEXiCON hosting service and the others would be relevant to all service providers offering LEXiCON functionality. The LEXiCON platform must be able to curate the creation of templates as well as manage and structure various groups of users ***WHO*** will develop and use the templates following the LEXICON process. The following features have been explored to illustrate the proof of concept of what LEXiCON is trying to achieve and what a data dictionary service provider may need to do to deliver it:

1. Registration processes
2. Discovery of templates, Working Groups, Authorities
3. User Management including ***WHAT*** user rights are available
4. Process configuration
5. Curation of the template library
6. Subdomain management
7. Interconnection

As this is only proof of concept, some of the features were developed in technologies that lend themselves to ***WHAT*** that feature is trying to achieve. In other cases, features were developed in an existing data dictionary.

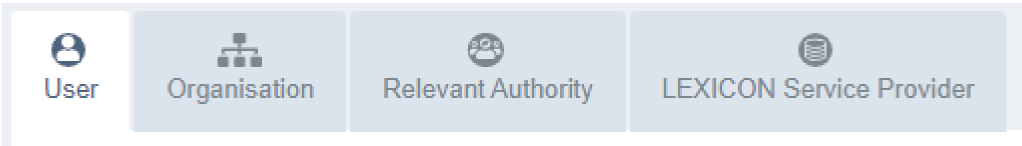
6.1 Registration process

LEXiCON platform has the capability to manage registration applications directly within its management section to help administrators add users. This functionality of the demonstration within the LEXiCON platform was developed in line with Section 4. Microsoft Forms was used as a prototype by embedding them within the system prior to creating the forms within the system itself. There is a relationship here with 'processes' in general in that a form is designed to take a recipient through a user journey to completion. See Figure 13 for the need for each type of application form to be accommodated by its own process to make it auditable if this is required.

6.1.1 Application form

A form was developed allowing users to choose which application they would be allowed to fill in. Users will be presented 4 options:

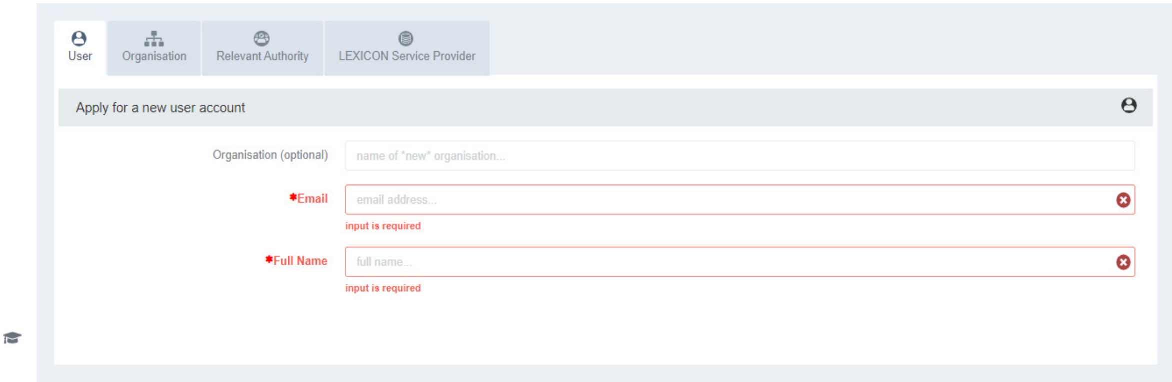
1. User (discussed in Section 4.1)
2. Organisation (discussed in Section 4.2)
3. Relevant Authority (discussed in Section 4.3)
4. Data Dictionary application



6.1.1.1 Individual user application

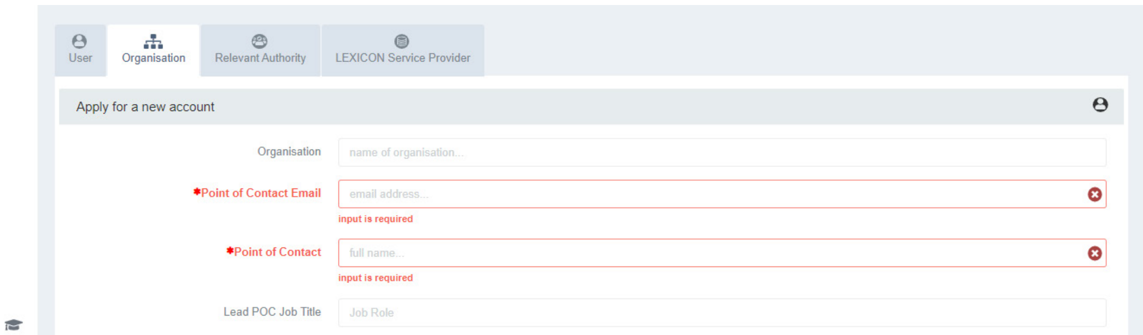
Individual users will be expected to fill in 3 fields:

1. Full name
2. Email
3. Who will they represent?



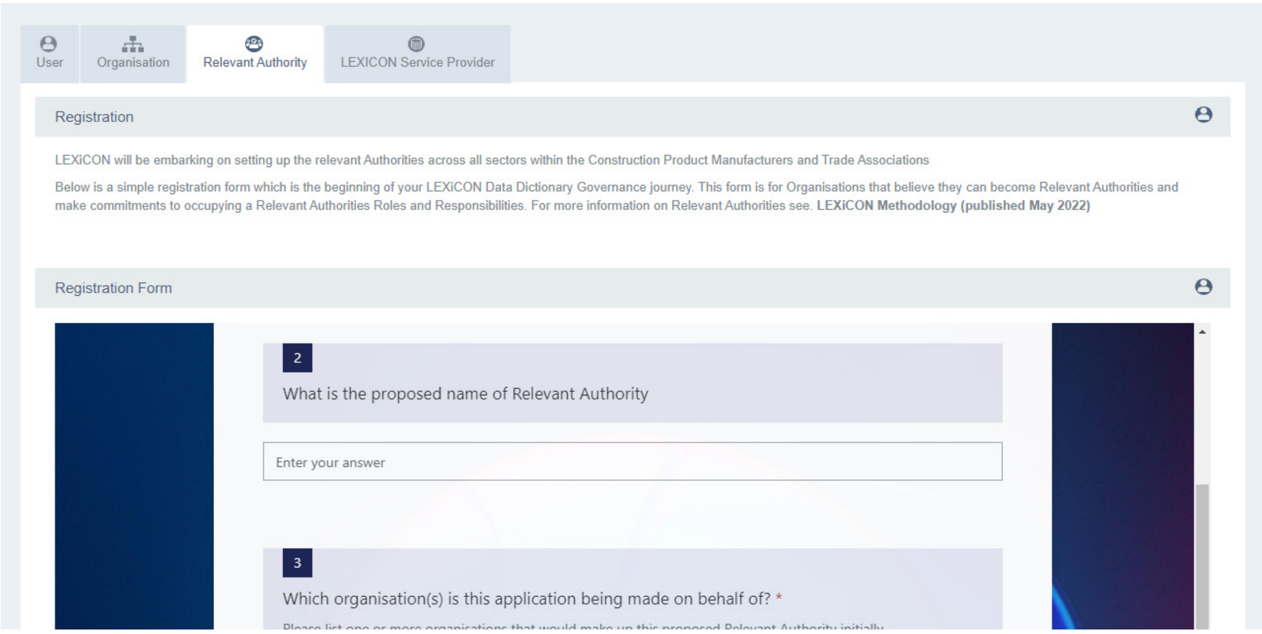
6.1.1.2 Organisation application

1. Administrator account email
2. Organisation name
3. Companies House Registration Number
4. SIC Code
5. Confirmation that they have authorisation to register the organisation



6.1.1.3 Relevant Authority application

1. Proposed **RA** name
2. Which organisation is the application being made on behalf of?
3. What kind of organisation will the **RA** represent?
4. Area of expertise, describe the scope of the authority
5. List of organisations that will be interested in the **RA**
6. Why do you believe the **RA** is needed?



6.1.2 Registration management

System administrators will have permissions to manage registration requests via a dedicated page. The system can be configured as shown in Figure 13 to follow suitable workflow for approval based on the type of application. If a user register with the system and their organisation already exists on the tool, organisation administrators will be able to handle their application and add them to the system as well. Administrators will have the ability to edit certain applications if needed to ensure that certain errors such as typos can be changed to ensure that the application is directed to the correct organisation.

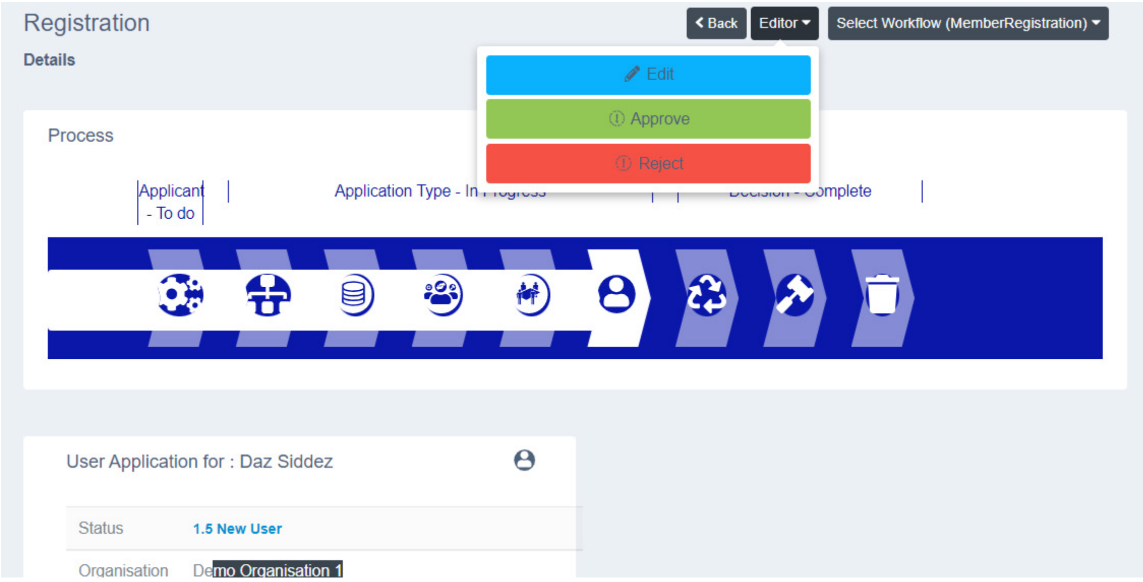


Figure 13 The workflow used to manage the registration process can be selected (Pease refer to Section 5)

6.2 Template creation

The system can be configured to run specific **PDT** creation processes if needed. This subsection will demonstrate the capability of the platform to execute the processes defined in Section 5. This subsection will be broken down into three main parts:

1. Utilisation of Master Templates in the system (Refer to Section 5.1 and Section 5.2)
2. **PDT** creation process configuration (Refer to Section 5.4)
3. **PDT** property creation process configuration (Refer to Section 5.5)

6.2.1 Master Template

The Master Template will be expected to be expected to be produce in Excel format to be imported into the system. In the case of the LEXiCON project the Master Template was created as described in Section 5.1. Once a **PDT** and its properties have been created users will be able to download the **PDT**s following this Master Template format.

6.2.1.1 Uploading Master Templates

Each Working Group will have the configurability on the system to upload their own Master Templates if needed. This configurability was built into allow authorities to change the presentation of their **PDT**s depending on the needs of the users of the **PDT**s. Figure 14 shows what a system administrator would be able to see when choosing a Master Template that will be most relevant to a particular Working Group.

It is anticipated that all users of the LEXiCON platform will be expected to use the default Master Template described in Section 5.1, and expanded on in Appendix A and Appendix B.

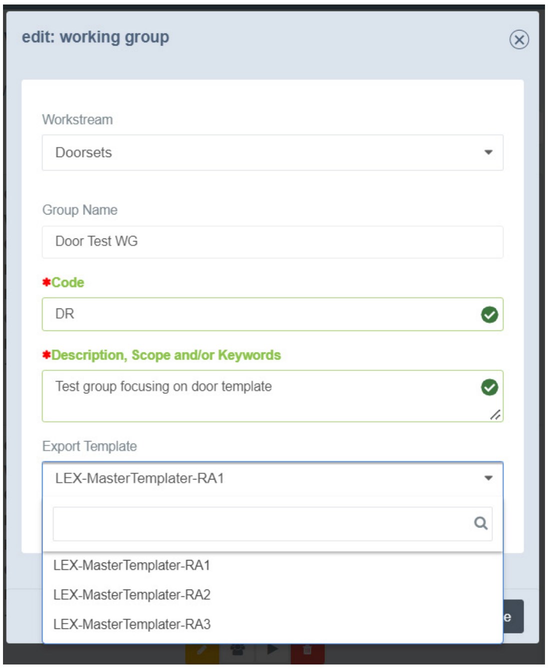


Figure 14 Master Templates can be provided to System Administrators who can then assign them to Working Groups

6.2.1.2 Downloading PDT in Master Template format

Once a **PDT** has been developed users will be able to download **PDT**s in the format of the Master Template that has been assigned to the Working Group. Once users have selected a **PDT** they would like to download, they will be able to navigate to the export page as shown in Figure 15 where they will be able to download the **PDT** in the Master Template format.

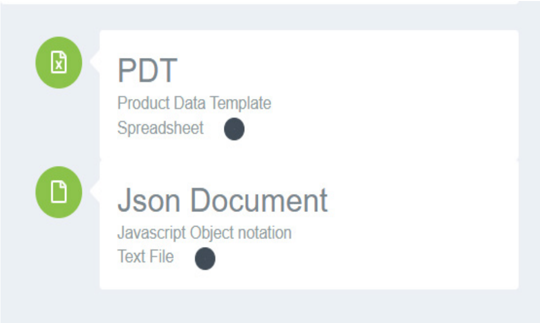


Figure 15 **PDT** export page that will allow users to download the **PDT**

6.2.2 PDT process

The **PDT** creation process can be configured within the system, and this subsection will highlight what users will be able to see based on the processes described in Section 4 and Section 5. The steps to configure the process has been described in Section 5.

6.2.2.1 Create and review PDT internally

This section will correspond with the process described in Figure 5 where most of the process will be carried out by the Working Group. First an external process will have to take place where the **WG** Lead will have to identify suitable candidates to be a part of their **WG** (described in Section 5.4.1). They will be able to also discover similar **WG**s and request members from other **RA**s to join their **WG**. This discovery process can be facilitated by the system that has been expanded in Section 6.3.

Figure 16 illustrates the area where administrators will be able to create **PDT**s when needed. It can be found in a private area of the system and only **WG** members will be able to see the **PDT** once it has been created.

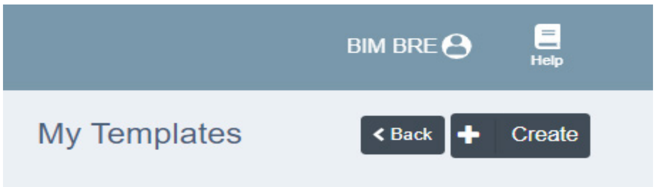


Figure 16 Working Group Leads and **RA**s will have a create button made available to them to create **PDT**s

The **PDT** creator will then be taken to a page as shown in Figure 17 where they will be able to fill in the details of the template they would like to create. They will be allowed to use information from templates that already exist in the system which then give the **WG** a starting point for creating their own template if needed.

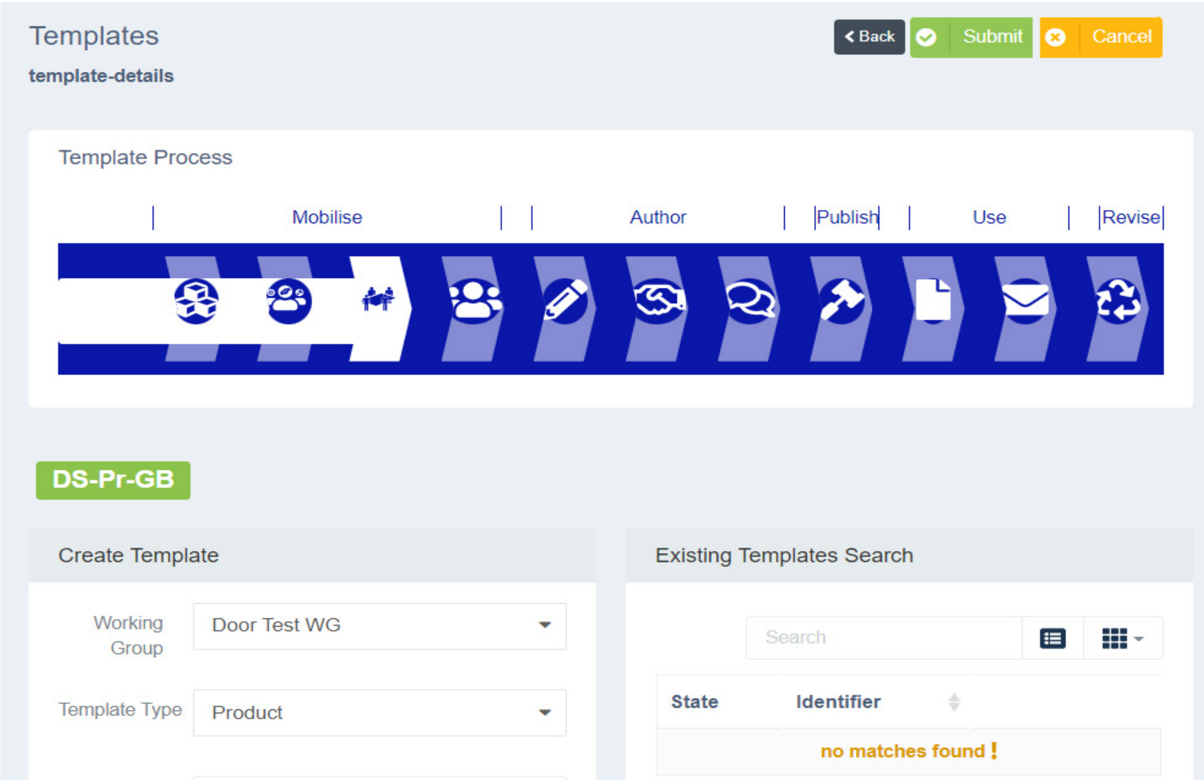


Figure 17 Template creation page (1- Template process workflow path, 2 – The new template details panel, 3 – Panel showing existing templates with the option to use its details)

Once the template has been created the **WG** members will be able to see the details of the template with a panel on top highlighting the development stage of the template as shown in Figure 18.

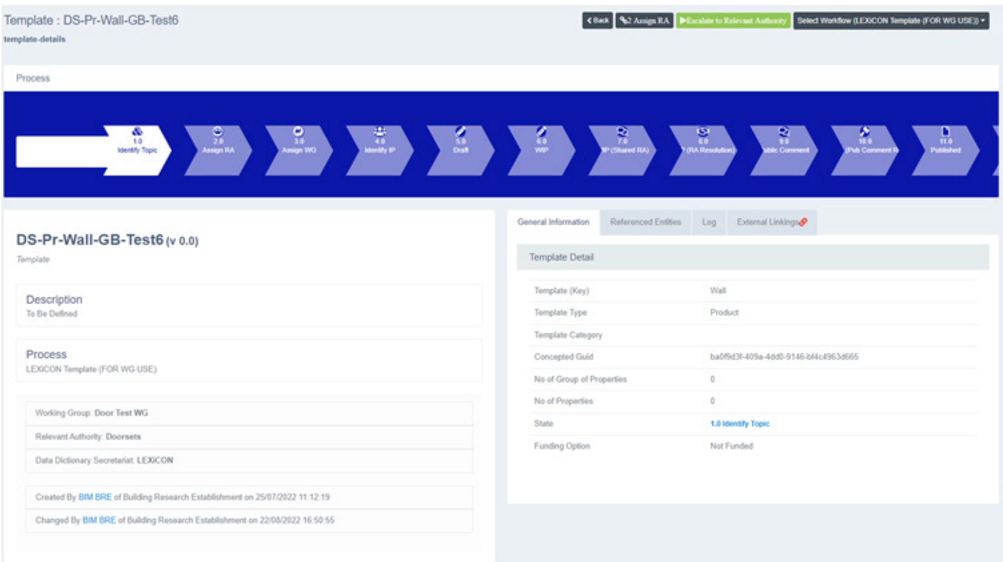


Figure 18 Template details page showing the status of the template and the template development stage

The **WG** members can be given access rights as will be discussed in Section 5.4, and then they will be tasked with creating properties for the templates and will follow the property creation process described in Figure 9. As Figure 19 shows authorised users will be able to create template properties, and where available they will be able to see any existing published properties that they will be able to use if needed. As described in the property creation process, users will be then able to copy the existing property or create their own property.

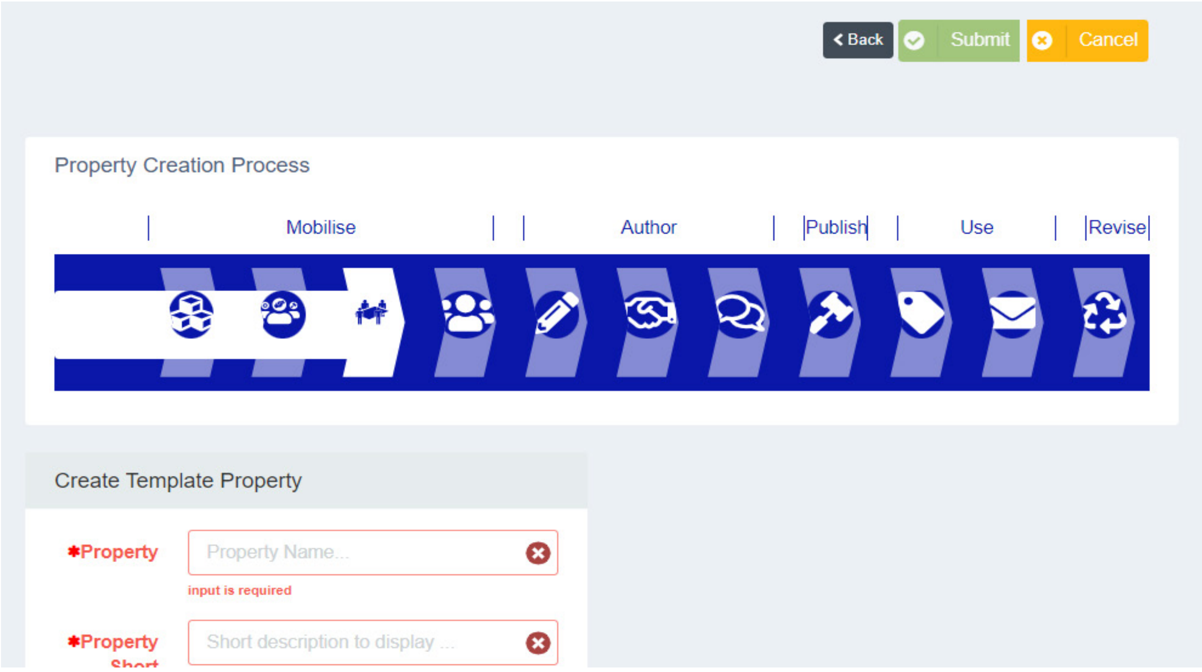


Figure 19 Creating Template Properties on the system (1 – Property Workflow Path, 2- Property creation panel)

Once they have created or copied the relevant property, they will be able to further edit the properties based on the requirements of the **WG**. They will be presented with a page as shown in Figure 20 which will then allow them to edit the description, data types and add more detail if needed. As shown in the page, users also will be able to review any external links the property has. Once the properties have been created, and the **WG** is satisfied with them, the template will be sent over to the **RA** to review.

6.2.2.2 Relevant Authority Review

Once the **WG** sends the **PDT** and its associated properties to the **RA**, they will be able to comment on the **PDT** as described in the template process described in Figure 6. When an **RA** clicks on a **PDT** they have to review, they will then be able to go through each of the properties associated to the template, and comment on them as described in the process in Figure 10.

Figure 21 shows Actions visible to the RA roles when at this stage of the **PDT** process.

Once the **RA** has commented on the **PDT** and its properties, they will then be able to push it back to the **WG** to amend the **PDT** and send it back to the **RA** for approval. This approved **PDT** will then be sent out for public consultation as described in Section 4.4.6.

6.2.2.3 Public consultation and resolution

Once the **PDT** has been sent out to public consultation, Registered Users will be allowed to view and comment on the **PDT** as described in the processes in Figure 7 and Figure 10. They will have the ability to suggest template metadata such as classifications and descriptions as well as changes and additions to template properties as well. These comments can be monitored by the group in the template summary panel shown in Figure 22.

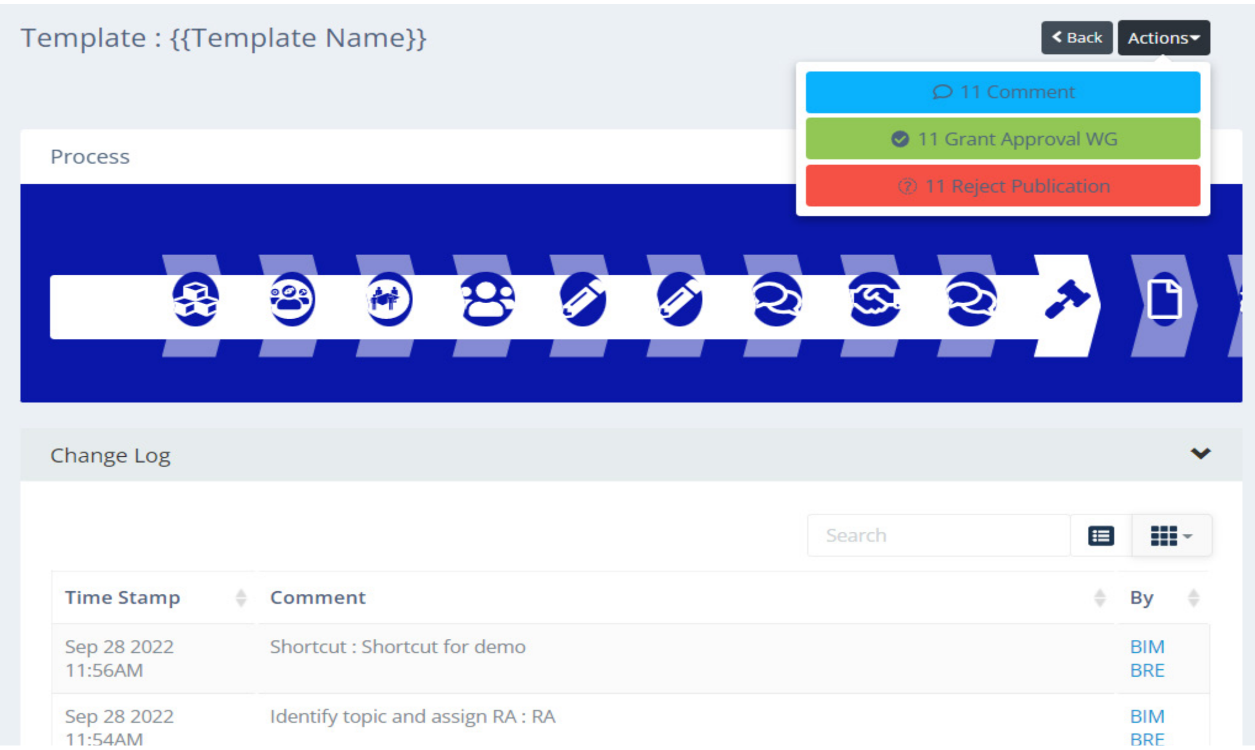


Figure 22 **PDT** details page that **WG**s will be able to see including a panel with comments made against a **PDT** which will help

monitor any public comments made against it

Once the **PDT** has gone through the public consultation phase as described in Section 5.4.7, the **WG** will be able to address the comments and make amendments to the **PDT** and its properties. Once the **WG** is satisfied with the changes and the **RA** approves this final amendment, it will be published on the system by the **RA**.

6.2.2.4 Publication and versioning

At the published stage, general users will have the option of commenting on a template as shown in Figure 23, and the **WG** leads, and authors will have the ability to edit the **PDT** if required. Based on the feedback of the registered users the **WG** and the **RA** then will go through a loop of internal review and approval prior to publishing an amended version of the template. Users will also have the opportunity to go back and check previous versions of the **PDT** in case they need to refer back to it.

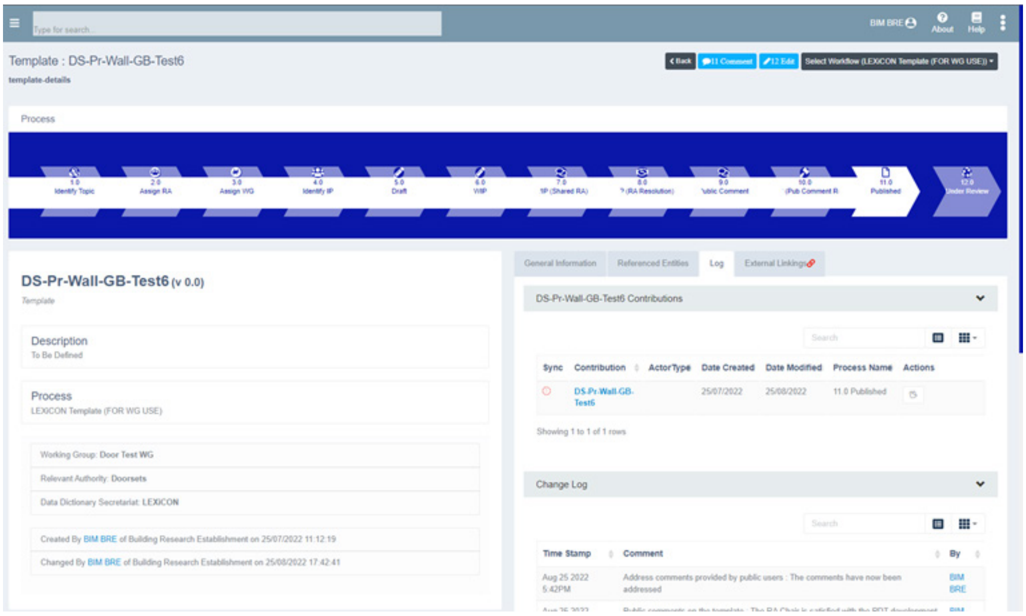


Figure 23 The Template Summary page that an **RA**s, **WG** leads, and authors will be able to view (Refer to Section 5.4.9)

6.3 Discovery

Discovering templates, Relevant Authorities and Working Groups as mentioned in both Section 4 and Section 5 will be facilitated by the LEXiCON services it offers to service providers. An interactive Data Dictionary landscape diagram will be available to users to understand which authorities, groups and templates already exist on the system. It also will display data dictionaries that have been interconnected with the system. There is a search functionality within the interactive diagram that will highlight all elements that have been searched for which would allow users to easily browse the data dictionary landscape (Figure 24).

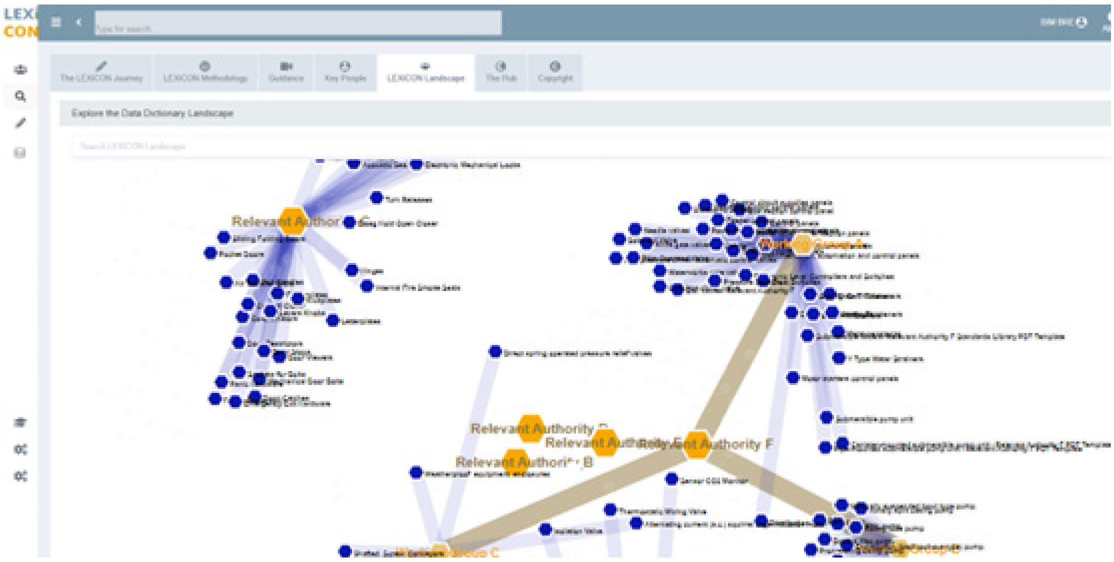


Figure 24 Screenshot of the Data Dictionary Landscape diagram potentially showing all registered **RA**s, their **WG**s, and their **WG**s public templates with status and links.

6.3.1 Arrangement criteria

Each of the nodes in the landscape diagram (illustrated in Figure 24) available on the LEXiCON platform will be represented using the symbols defined in the LEXiCON Methodology Document. Users will be able to see the various data dictionaries that are interconnected with the LEXiCON platform, the Relevant Authorities, Working Groups, and their associated templates.

The diagram will arrange itself primarily based on the classifications of the templates within the system (Uniclass 2015). Then the custodian organisations of those templates will arrange themselves based on their templates. Further, the diagram has a 'Voronoi diagram' underlaying the nodes which creates equidistant boundaries between each **RA** on the landscape diagram. This Voronoi diagram is expected to assist users with identifying which authorities will be most relevant to them ***WHEN*** they register on the system.

6.3.2 Search functionality

The landscape diagram also will contain a search bar which will highlight the relevant nodes within them. This will help with the discoverability of organisations, and **PDT**s that have been published or have been made visible during specific stages of their development (Refer to Section 5.4.11).

6.3.3 Available data

When users click on specific **PDT** nodes within the diagram, they will be able to view the **PDT** name, classification and description as referred to in Section 5.4.11.

6.4 Membership management

General Users ***WHO*** register within the system will have the opportunity to become a member of any of the categories that have been discussed in Section 5. As a basic registered user, they will have the opportunity to download templates, comment on any of the templates that are out for public consultation and register their interest in any **WG**.

Working Group members will be able to contribute towards the development of **PDT**s that are under the jurisdiction of their group. As discussed in Section 4, there will be three different variations of user rights within the **WG** which are:

1. Working Group Lead – Will have direct communication with their **RA**, and therefore can send their **PDT**s for review, edit the **PDT**s, and arbitrate any disputes that may occur within their group.
2. Working Group Technical Authors – This role can be given to more than one member of the **WG** and will be left to the discretion of the **WG** Lead to appoint these members. These users would be allowed to edit **PDT**s within their **WG** and ensure that the quality of the data within their **PDT**s are suitable to be used by industry.
3. Working Group members – Members will allow to comment on templates within their **WG** and provide feedback to assist with the development of their **PDT**s

Relevant Authority members will be given user rights to administer roles within their jurisdiction, provide feedback to their **WG**s and assess **PDT**s to ensure that they are suitable for publication. They therefore will have access to the administrative area of the LEXiCON platform to manage and arbitrate their members, and comment on **PDT**s.

The LEXiCON platform has the configurability to give the different roles suitable access to perform their tasks whether they are administrative or they are related to the development of templates. Section 6.5 will further expand on the configurability of the system to meet the requirements set in Section 5.

The configured processes then can be associated to **RA**s and **WG**s ***WHO*** will then be able to assign specific users within their organisations to the roles they have created. By default, the template creation process will be configured to that specified in Section 5 and all parties that are created within the system will be automatically associated to this default process (Figure 25).

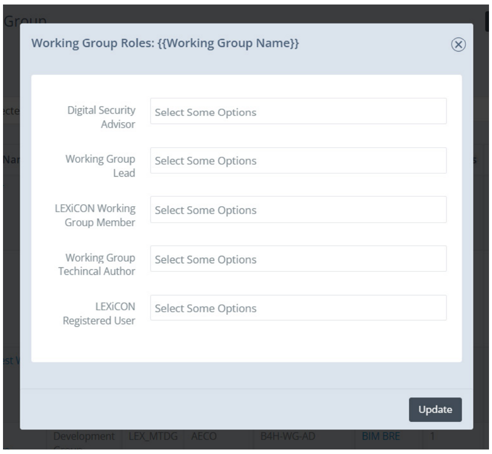


Figure 25 Individual users then can be added to the roles that have been defined (default configuration follows the LEXiCON methodology)

6.5 Process configuration

WHO can DO ***WHAT WHEN***

WHO can SEE ***WHAT WHEN***

This section will cover the configurability within the LEXiCON platform to follow the processes described in Section 5. By default, the Roles (***WHO***), Key template stages (***WHEN***), Activities (***WHAT***) and Tasks (detailed ***WHAT***) will be defined within the system.

Then these definitions will be configured to give the process meaning by Associating Roles and Tasks (***WHO*** can do ***WHAT***), Associate Tasks and Stages (***WHAT***'s done ***WHEN***), and Transitions (***WHO*** does ***WHAT*** and ***WHEN***).

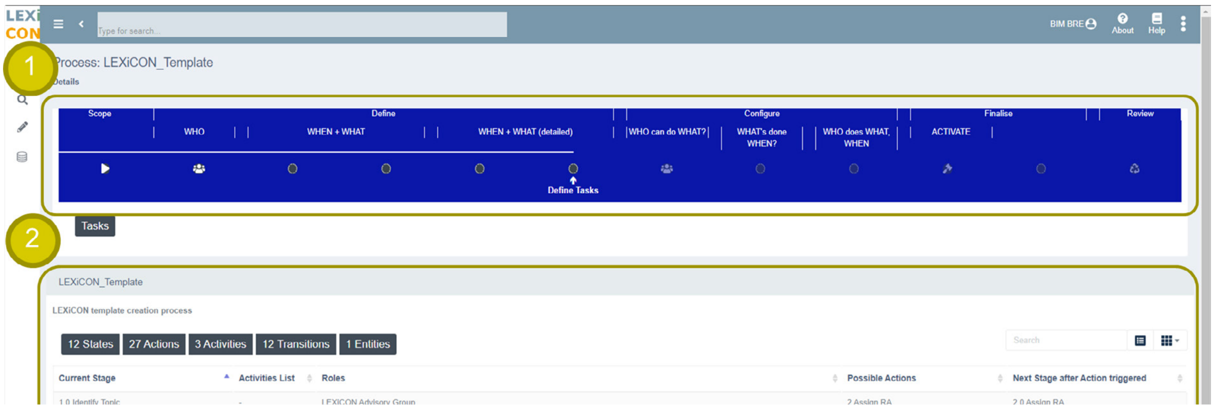


Figure 26 Workflow configuration page summarising the process to create a workflow (1 – Flowchart showing which stage of the configuration process the users is in, 2 – Section summarising the elements of the process)

Once the definitions and configurations are complete, the process can be finalised and assigned to the Authorities in the dictionary. This section gives an overview as to ***HOW*** the workflows defined in Section 5 were translated and configured directly within the platform (Interactive flowchart available to users illustrated in Figure 27).

Figure 27 Interactive flowchart available to system administrators to configure processes

6.5.1 Membership management

The processes of registering users to developing templates involves several roles that have been defined in the LEXiCON methodology, with each user covering one or many of those roles. Each of the roles have been described in detail in Section 4. The LEXiCON platform has the configurability to control ***WHO*** can see and do ***WHAT*** within the system. There are 3 main levels within the administration aspect of the dictionary:

1. Dictionary level – This will be the level configured for system administrators and to certain members of the steering group to handle the main content of the dictionary and to arbitrate any overarching issues.
2. Relevant Authority/Workstream level – At this level, **RA** chairs, secretariats and managers will be able to control all the functions at their level, and if needed within the **WG**s that are their jurisdiction.
3. Working Group level – The **WG** Leads, and Technical Authors will be able to give permissions and carry out any necessary functionality in the template creation process.

The above three levels each will contain multiple 'Roles', for example a Working Group will have a lead, technical authors (for editing templates), and members (commenting and steering the creation process). These roles have already been created on the system based on the LEXiCON methodology and are unlikely to need further configuration. The system has been configured by default to allow users to comment on behalf of the organisations they would like to represent as shown in Figure 28.

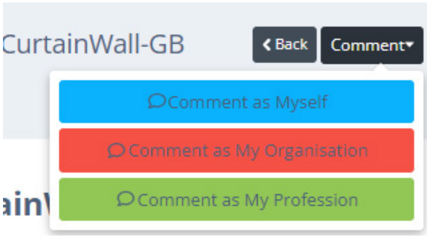


Figure 28 Users will have the ability to comment on behalf of the organisations they represent

6.5.2 Entities

The LEXiCON platform will have three main entities: templates, properties, and groups of properties. This will help with giving the processes a scope to operate in.

6.5.3 Roles (***WHO***)

Each role that has been defined in the LEXiCON methodology document can be created to define the ***WHO*** within the process.

6.5.4 Process states (***WHEN***)

States will be used to define where an entity is within a specific process (***WHEN***).

6.5.5 Activities & Actions (***WHAT***)

The difference between Actions and Activities are that Actions are granular and specific within the application functionality whereas Activities provide an opportunity to externalise actions to other systems. For example, a 'voting' system can be defined as a set of specific actions in a sequence within the system, or an alternative system which might be better suited could provide such a feature and simply listed as an activity in LEXiCON's process. Activities would still require evidence of it happening but wouldn't require minutiae of logging each vote, and simply be a record of the result of the vote conducted externally. It ould be for LEXiCON to define what level of recording and auditing it would wish to record in its system.

6.6 Library curation

The LEXiCON platform will store all properties developed within the system in a library. ***WHEN*** a user starts creating a property for their own **PDT**, the system will automatically provide a list of potentially related properties that they will be able to copy. If needed, once the property has been copied over, users will then be able to modify fields such as the units and description.

The platform has this facility within its template creation page as shown in Figure 29. ***WHEN*** a user starts typing in a property name, they will be presented with a list of existing properties in a panel on the right of the page. Users then will be able to browse through this list and use an existing property if needed.

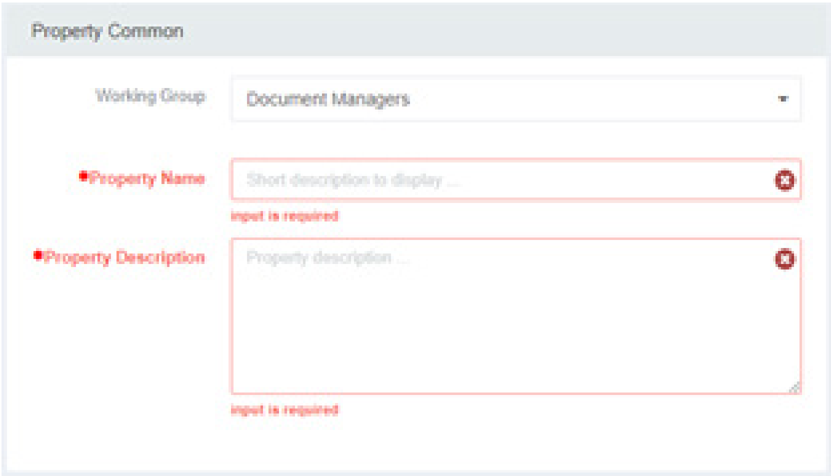


Figure 29 Property creation page - feature to use existing properties in the **PDT**

6.7 Export formats

Users will be able to export **PDT**s in several formats via the LEXiCON platform . Through the interface by default, they will be able to download templates in:

1. Spreadsheet formats
2. **PDT** (Master Template format)
3. JSON

They will also have the opportunity to access the templates via API and receive responses in:

1. JSON
2. XML

This will give users the autonomy to access information and integrate templates into their software if needed. Consideration has been made to ***WHO*** can see ***WHAT*** went so ***WHEN*** templates are in their earlier stages of development. Therefore, the individual details of the out

6.8 Subdomain management and capability

The LEXiCON platform should be able to manage separate subdomains where needed which will allow **RA**s to host the application using their domain URL and their own branding if needed which supports the establishing of identity within a LEXiCON network. This feature was explored by the Construction Innovation Hub to help authorities encourage engagement within their specific domains.

This is similar to how many well know multi-tenant service providers enable the admin of the tenant to point their custom urls to the service.

If an **RA** would like to use this feature it can be an optional part of its registration process.

For example if the url for lexicon is in the format:

lexicondomain.com,

lexicon could offer its relevant authorities sub domains of this url,

releavntauthority1.lexicondomain.com

or the relevant authority who owns a domain already (e.g. relevantauthority.com), could create their own subdomain along the lines of:

lexicon.relevantauthority.com

In all cases a valid Https:// security certificate would be required and the most cost effective way for lexicon to do this would be under a wildcard if it were to provide urls for its relevant authorities.

Having this as a possiblity, helps with identity discoverability and memoerability of a relevant authorities specific data dictionary.

7 Future consideration

This section covers the aspects of the process and the tool that will be considered in the next phase of development for LEXiCON. It should be noted that this is not an exhaustive list.

7.1 Governance processes

A formal method to gather lessons learnt from Relevant Authorities would be needed to further refine the LEXiCON process and platform. The process of capturing, managing and addressing the lessons learned will be defined in the future. The establishment of the LEXiCON Board will be crucial for some key operational decisions to be made

7.2 Securty Mindedness

It is recommended that LEXiCON develop a security-minded process that occurs prior to template consultation where sensitive properties may be identified and marked as such. The inclusion of such a process will help the supply chain and client organisations recognise where data may be sensitive. As Data Templates are separated from projects, there is a recognition that sensitive properties are to enable downstream use of data templates and data sheets to adequately consider how to handle the data within its context. It does not serve as a substitute to security-mindedness happening at project level, but as an aid and indicator when applying PDTs. The development of a security minded process is something that will be refined over time and is beyond the scope of what has been set out for Relevant Authorities and Working Groups.

7.3 Maintenance

The maintenance of the dictionary and its content will have to be considered.

7.4 Data management

Processes defining ***WHO*** will manage the dictionary content still needs to be defined, along with the expertise of the role.

7.5 Accompany training and support

Accompanying training and support will have to be defined in the future. This can be in the form of video tutorials, documentation, tooltips and forums (as discussed briefly in Section 5.3).

7.6 Beta testing

The process and the system will have to be tested by early adopters to provide feedback and produce templates.

7.7 Liability/Legal

Legal considerations such as but not limited to data protection (GDPR), copyright, ownership, liability, terms and conditions. LEXiCON would need to provide its Terms and Conditions and may also provide additional appendices to any that its system provider would have. There will also be a need to define reserved rights to change Terms and Conditions if needed and more explicit communication around the ownership of Templates themselves residing with the Relevant Authority, but license made available and irrevocable through open licensing criteria. Also, PDSs will be expected to be the sole responsibility of the provider of them.

8 Next steps

The first two phases of the LEXiCON project led to the development of the LEXiCON methodology document, the definition of registration and template creation processes, as well the development and demonstration of configuration of a LEXiCON platform . Figure 31 illustrates the Technical Readiness Level (TRL) of the demonstration platform and the LEXiCON process setup.

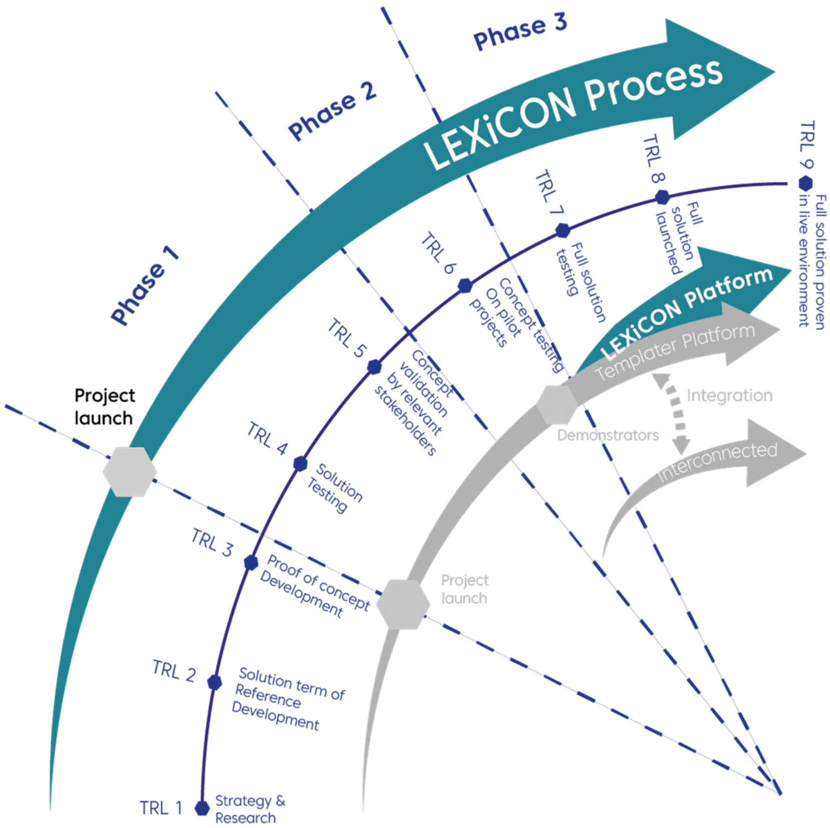


Figure 31 Technical Readiness Level (TRL) progress through the LEXiCON project phases

The platform that has been developed followed the objectives of transparency and openness that will encourage the widespread adoption of the development and use of **PDT**s while following a collaborative process. The expectation is that these principles will be carried forward into Phase 3 of LEXiCON.

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BEAMA
BSI
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Construction Innovation Hub
Construction Products Association
CIBSE
EDA
ETIM UK
GAI
Kingspan
Legrand
Tata Steel
Transport For London

Reference to standards

The following documents are referred to in the text. For dated references, only the edition cited applies.

BS EN ISO 23386:2020	*Building information modelling and other digital processes used in construction — Methodology to describe, author and maintain properties in interconnected data dictionaries*
BS EN ISO 23387:2020	*Building information modelling (BIM) — Data templates for construction objects used in the life cycle of built assets — Concepts and principles*
PAS 14191:2020	*Built environment — Management and operation of interconnected construction data dictionaries — Specification*
BS EN ISO 12006-3:2016	*Building construction — Organisation of information about construction works — Part 3: Framework for object-oriented information*

Terms and definitions

For the purposes of this document, the following terms and definitions apply.

Consensus

General agreement, characterised by the absence of sustained opposition to substantial issues by any important part of the concerned interests and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments

NOTE Consensus need not imply unanimity.

[SOURCE: ISO/IEC Guide 2:2004, definition 1.7]

Construction object

Object of interest in the context of a construction process

EXAMPLE 1 The construction object 'wall' is a type of system.

EXAMPLE 2 The construction object 'calcium silicate masonry unit' is a type of product.

[SOURCE: BS EN ISO 23387:2020, definition 3.4]

[SOURCE: ISO 12006-2:2015, 3.1.2, modified]

Data dictionary

Database that contains metadata

[SOURCE: ISO 2382, 2121501, modified - The admitted term "information resource dictionary" has been removed. The notes to entry have been removed.]

Data dictionaries shall implement one of three levels of functionality:

- Properties and grouping of properties only (Type 1);
- Properties and data templates (Type 2); and
- Properties, data templates and data sheets (Type 3).

NOTE A dictionary can contain extra functionality, creation and hosting of data templates and the creation and hosting of completed templates (data sheets).

[SOURCE: PAS 14191:2020, definition 4.1]

Data sheet

Data template that is populated

[SOURCE: PAS 14191:2020, definition 3.4]

Data template

Schema providing a data structure used to describe the properties of objects

[SOURCE: PAS 14191:2020, definition 3.5]

Group of properties

Named collection of properties

Interested party(ies)

Person(s) or organisation(s) that expresses legitimate interest in properties or groups of properties in a data dictionary

NOTE This term is synonymous with 'Expert', as defined in BS EN ISO 23386:2020

[SOURCE: PAS 14191:2020, definition 3.10]

LEXiCON Board

It is recommended that a LEXiCON Board be created that will consists of a Chair and a Vice-Chair, alongside incorporating BRE and CPA representation as initial joint programme owners. The Board will also consist of the LEXiCON Steering Group Chair, other members drawn from the LEXiCON Steering Group and a Secretariat.

For the purposes of intelligibility, it is assumed that a LEXiCON board will be created in the future to oversee the LEXiCON Methodology, and therefore the remainder of the document and procedures within have been authored in this context.

LEXiCON Steering Group

LEXiCON steering group is a group of users made up from the wider user membership creating a broadchurch view to inform LEXiCON Board policy making.

Product

Construction product

Item manufactured or processed for incorporation in construction works

[SOURCE: BS EN ISO 23387:2020, definition 3.9]

[SOURCE: ISO 6707-1:2017, 3.4.1.3, modified]

Property

Inherent or acquired feature of an item

NOTE Examples include thermal efficiency, heat flow, sound reduction index, colour, voltage

[SOURCE: ISO 6707-1:2017, 3.7.1.3, modified]

Relevant Authority

A recognised body with a requisite expertise concerning products included in its area of jurisdiction

NOTE Examples of a Relevant Authority may include; a Trade Association acting within its remit, a group of manufacturers producing similar product types which is assembled ad-hoc, an individual manufacturer making a unique product.

All of the above examples should be the starting point for a Relevant Authority and other interested parties should be invited to join. Acceptance of each Relevant Authority shall be by the LEXiCON Board.

Secretariat

Body responsible for the secretarial, clerical and administrative affairs

[SOURCE: PAS 14191:2020, definition 3.16]

Security-minded

Understanding and routinely applying appropriate and proportionate security measures in any business situation so as to deter and/or disrupt hostile, malicious, fraudulent and criminal behaviours or activities

[SOURCE: BS EN ISO 19650-5:2020]

Working Group

A subdivision of a Relevant Authority, including Interested Parties from outside the **RA**, tasked with authoring and maintaining one or more **PDT**s

Appendix A

Template metadata that will be made available to users

Name	Description from related dublin core metadata
Product Data Sheet Topic (MUST)	Typically, the subject will be represented using keywords, key phrases, or classification codes. Recommended best practice is to use a controlled vocabulary source: http:/purl.org/dc/elements/1.1/subject NOTE: this is a field about a http://purl.org/dc/dcmitype/PhysicalObject
Topic Description (MUST)	An account of the resource. source: http://purl.org/dc/elements/1.1/description
Template version (MUST)	An unambiguous reference to the resource within a given context. source: http:/purl.org/dc/elements/1.1/identifier
Template Stage (MUST)	The name of the stage declared by a process that this resource is at at the point in time of access. NOTE this would name LEXiCON and its methodology version.
Relevant Authority (MUST)	Any changes in ownership and custody of a resource since its creation that are significant for its authenticity, integrity, and interpretation. source: http://purl.org/dc/terms/ProvenanceStatement
Custodian Organisation (MUST)	An entity primarily responsible for making the resource. source: http://purl.org/dc/elements/1.1/creator
Date Last Modified (MUST)	http://purl.org/dc/terms/modified source: Date on which the resource was changed.
Date Created (COULD)	Date of creation of the resource. source: http://purl.org/dc/terms/created
preceding version (MUST)	A related resource of which the described resource is a version, edition, or adaptation. source: http://purl.org/dc/terms/isVersionOf

Template UUID (SHOULD)	An unambiguous reference to the resource within a given context. source: http:/purl.org/dc/elements/1.1/identifier
Participating Organisations (COULD)	An entity responsible for making contributions to the resource. source: http://purl.org/dc/terms/contributor
Coverage (COULD)	The spatial or temporal topic of the resource, spatial applicability of the resource, or jurisdiction under which the resource is relevant. source: http://purl.org/dc/terms/coverage
Funding Info (COULD)	Any changes in ownership and custody of a resource since its creation that are significant for its authenticity, integrity, and interpretation. source: http://purl.org/dc/terms/ ProvenanceStatement
copyright (SHOULD)	A legal document giving official permission to do something with the resource. source: http://purl.org/dc/terms/license
Process (SHOULD)	The name of the process this resource followed for its creation. NOTE this would name LEXiCON and its methodology version.
Template Scope (COULD)	The scope of the template in broad terms. E.g Building, Element, Material, See ISO12006-2 for the broad framework of classification tables NOTE LEXiCON is focussed on the Product Level.
Relating Classifications (23387)	source: http://purl.org/dc/elements/1.1/source
Relating Documents (23387)	A related resource from which the described resource is derived. source: http://purl.org/dc/elements/1.1/source
Related Associations (23387) Composition and Specialisation	A related resource from which the described resource is derived. source: http://purl.org/dc/elements/1.1/source
Data Dictionary Type (PAS14191)	*See PAS14191 for the defintions of Types 1, 2 & 3* *NOTE: LEXiCON is a Type 2 dictionary.*

Appendix B

Property fields

Field	Description
Information Category	A grouping that helps with presentation of properties within a PDT
Property Name	Name of property in Language
Value/Answer	This is the measured value that is held by a PDS. NOTE this would be blank in a PDT, but expectations on this value might be put in place by a PDT creator.
Units	A unit to represent a scale that enables a value to be measured It is possible to use this attribute to explain there is no unit attached to the property by using "unitless" source: BS EN ISO 23386
Method	Evaluation of construction products to ensure their fitness according to requirements in harmonised technical specifications (definition from BS EN ISO 23386)
Plain Language Question	The property in the form of question that is phrased to allow a PDT consumer to understand and provide an answer to.
SI Dimension	In case of a physical quantity, dimension according to ISO 80000 (all parts) source: BS EN ISO 23386 Physical quantities are expressed in International System (SI) units Non-physical quantities such as text are expressed with the value "without"
Description	This attribute is used to provide a plain language description of the property

Property GUID (MUST)	Unique identifier generated using an algorithm source: BS EN ISO 23386 NOTE: It is recommended that Harmonised Unique Identifiers are sought.
Harmonised Unique Identifiers HUID (COULD)	This is a technique that has been explored during the Hub. The algorithms for this are under review currently and more development of the techniques and beneifts of adopting should be communicated in follow up work. It builds on RFC 4122 with specific qualities that lend themselves to de-duplication, provenance and definition integrity whilst decentralising the dependency on the issuer of the GUID. It wouldn't be compulsory for a data dicitonary to implement as it could be implemented by the consumer of a data dictionary.
Property Status	Status of the property during its life cycle (definition from BS EN ISO 23386)
Property Date of Creation	Date of validation of the property creation request by experts (definition from BS EN ISO 23386)
Property Date of Activation	Date after when the property can be used (definition from BS EN ISO 23386)
Date of last change	Date of validation of the last change request by experts (definition from BS EN ISO 23386)
Date of Revision	*Date of the revision (definition from BS EN ISO 23386)*
Date of Version	*Date of the version (definition from BS EN ISO 23386)*
Date of deactiviation	*Date as of which the property becomes obsolete; the property is maintained in the data dictionary (definition from BS EN ISO 23386)*
Related Properties	*List of the globally unique identifier of the connected properties (attribute PA001); the value of one property is related to the values of the other ones. For example, a sound absorption coefficient is given for a specific frequency, in this case sound absorption and frequency are connected properties (Connected properties definition from BS EN ISO 23386)*
Property type	*A designation of either 'Generic' or 'Specific' as indicated in ISO 23387*

Appendix C

Process meta data and structure

Field	**Description**
Authority Owner	LEXiCON
Name + version	LEXiCON v1
Entity Type	Template
{***WHO***} can do/see {***WHAT***},{***WHEN***}	List of {Data DictionaryRole},{Action(s)/ Activity(ies)},{Stage/State/Status}

Appendix D

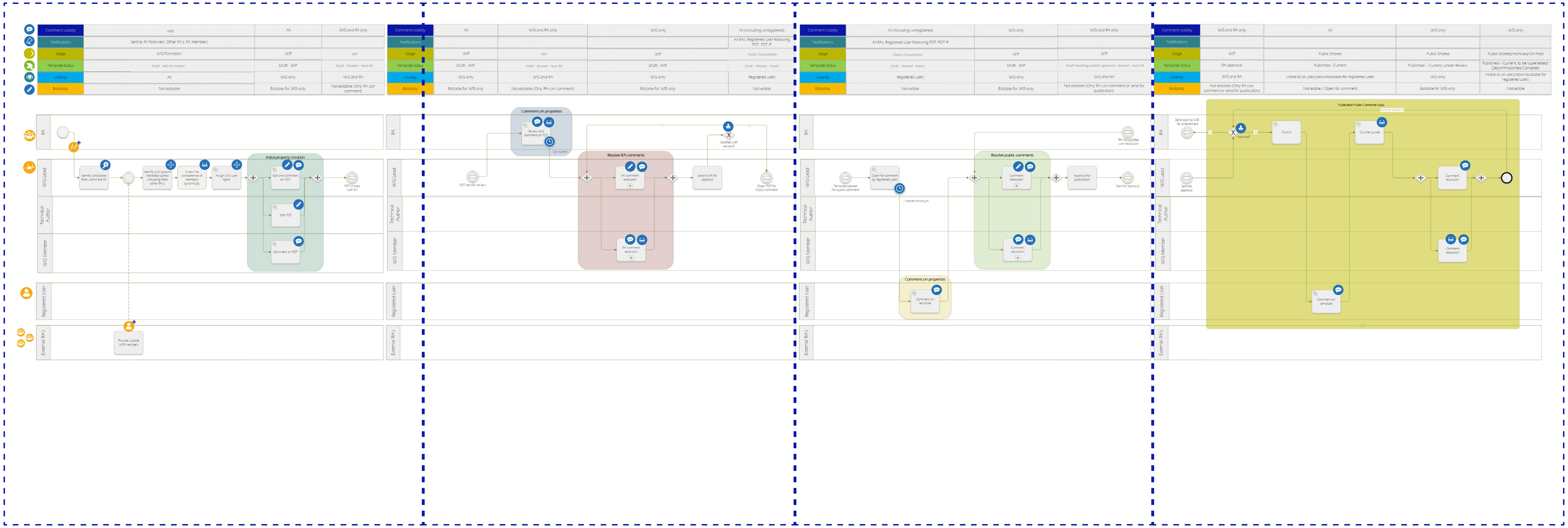

Figure 5 Figure 6 Figure 7 Figure 8

*Figure 32 **PDT** creation process map*

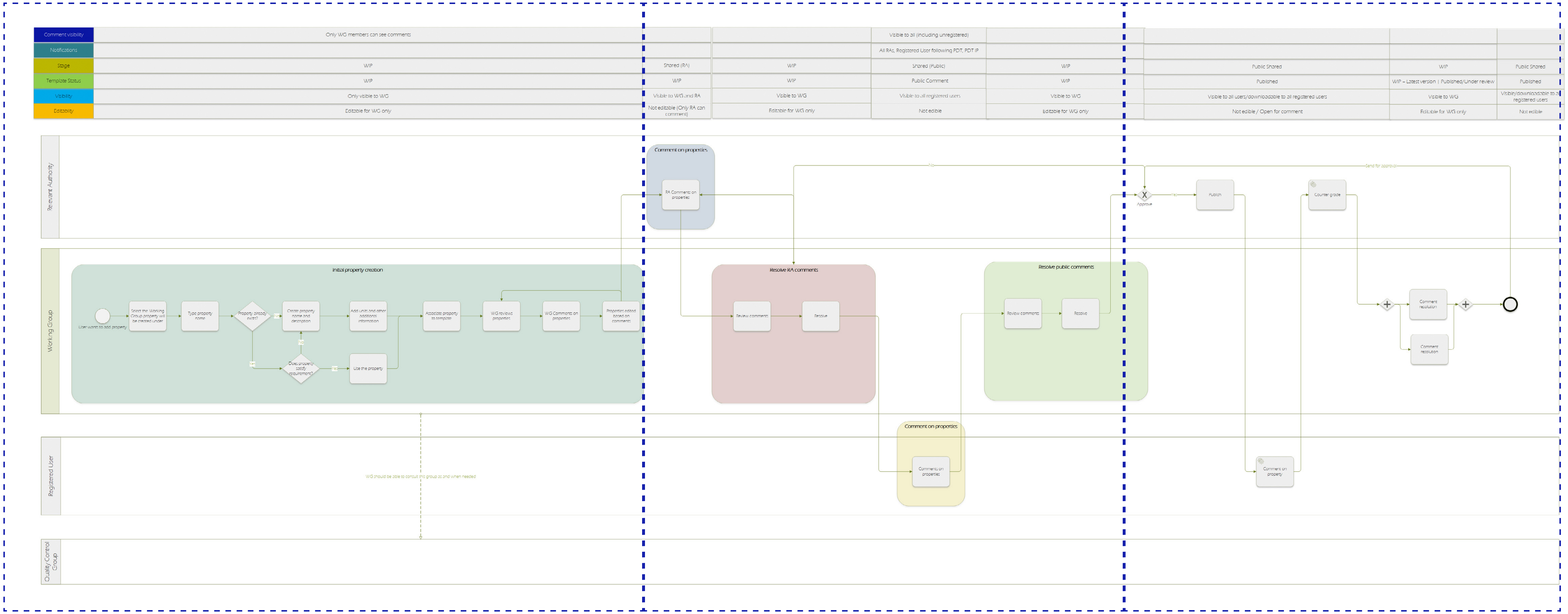

Figure 9

Figure 10

Figure 11

Figure 33 Property creation process map

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