

# **Walkthrough of mappings**

**Use of the Topic Maps methodology**

**Michel Biezunski, October 12, 2020**

# Mapping Methodology

- Multi-point mapping
  - Create a hub that collects the various items mapped together.
  - Enables extending mapping with future standards



# Network


- aka Knowledge Graph, Knowledge Base, Semantic Network, Semantic Graph, Topic Map, Concept Map
- Choice: use the concepts from Topic Maps (ISO/IEC 13250)
- Nodes (vertices):
  - Items connected together in a graph. Items = hubs, concepts, nodes, topics.
- Relationships (edges):
  - Open Relationship semantic
  - Taxonomical organization: one type of relationship

# Naming




- Using Scope to mark the provenance of each item (e.g. Core Components, XBRL, SAF-T, etc.).
- Synonyms: Multiple names per topic.
- Multilingual names when available.




... **Accounting Account Classification. Type. Code** • UN/CEFACT




... UN00004767 :: Unique UN assigned ID  



 Names




... **Accountant Address Active** • gl-bus




... Adresse active du comptable  Français  




... Dirección del Contable Actual  Spanish  

... Endereço Ativo do Contador  Portuguese  

... gl-bus:accountantAddressActive  

... Indirizzo attivo  Italian  

... 会計事務所住所有効性  Japanese  

... 会计人员地址有效性  Chinese  

# Data acquisition

- Each identifiable item in a participating standard becomes a topic.
- Topics are interconnected in every standard: Core Components Network, XBRL taxonomy, SAF-T schema containment
- Initially, the network comprises the concepts inherited from each participating standard plus their internal relationships. The origin of each topic is marked as the scope in their name (used to differentiate same topics originating from different standards)

# Connectivity

- Taxonomies:
  - XBRL
  - SAF-T
- Graph:
  - CC related to others.
- Non-limited semantics in relations.

AccountID ▾ SAF-T

Kontonr ▾ SAF-T  Norwegian :: XML Element Name

(6)

Account ▾ SAF-T

▾ GeneralLedgerAccounts ▾ SAF-T ▾ MasterFiles ▾ SAF-T ▾ AuditFile ▾ SAF-T

Asset ▾ SAF-T

▾ Assets ▾ SAF-T ▾ MasterFiles ▾ SAF-T ▾ AuditFile ▾ SAF-T

CompanyStructure ▾ SAF-T

▾ Customer ▾ SAF-T ▾ Customers ▾ SAF-T ▾ MasterFiles ▾ SAF-T ▾ AuditFile ▾ SAF-T

▾ Owner ▾ SAF-T ▾ Owners ▾ SAF-T ▾ MasterFiles ▾ SAF-T ▾ AuditFile ▾ SAF-T

▾ Supplier ▾ SAF-T ▾ Asset ▾ SAF-T ▾ Assets ▾ SAF-T ▾ MasterFiles ▾ SAF-T ▾ AuditFile ▾ SAF-T

▾ Supplier ▾ SAF-T ▾ AssetTransaction ▾ SAF-T ▾ AssetTransactions ▾ SAF-T ▾ SourceDocuments ▾ SAF-T ▾ AuditFile ▾ SAF-T

▾ Supplier ▾ SAF-T ▾ Suppliers ▾ SAF-T ▾ MasterFiles ▾ SAF-T ▾ AuditFile ▾ SAF-T

InvoiceStructure ▾ SAF-T

Line ▾ SAF-T

▾ InvoiceStructure ▾ SAF-T

▾ Payment ▾ SAF-T ▾ Payments ▾ SAF-T ▾ SourceDocuments ▾ SAF-T ▾ AuditFile ▾ SAF-T

▾ StockMovement ▾ SAF-T ▾ MovementOfGoods ▾ SAF-T ▾ SourceDocuments ▾ SAF-T ▾ AuditFile ▾ SAF-T




▾ Transaction ▾ SAF-T ▾ Journal ▾ SAF-T ▾ GeneralLedgerEntries ▾ SAF-T ▾ AuditFile ▾ SAF-T

TaxonomyElement ▾ SAF-T

▾ Taxonomy ▾ SAF-T ▾ Taxonomies ▾ SAF-T ▾ MasterFiles ▾ SAF-T ▾ AuditFile ▾ SAF-T


# Open Relation Semantics

- Relationships derived from extraction from various standards.
- New relationships can be created when needed.

Sender				
(3 relations)				
#	Relation Topic	Topic 1	Role	Topic 2
1.		Document. Details ◉ UN/CEFACT	Sender	Party. Details ◉ UN/CEFACT
2.		Processed Entity. Details ◉ UN/CEFACT	Sender	Organization. Details ◉ UN/CEFACT
3.		Processed Entity. Details ◉ UN/CEFACT	Sender	Software. Details ◉ UN/CEFACT


75 relation types

1.




Acceptable

2.




Access Availability

3.




Agent

4.




Appointed

5.




Attached

6.




Audit

7.




Billed

8.




Booking

9.




Closing Responsible

10.




Concerned

11.




Connected

12.




Containing

13.




Contractual

14.




Defined

15.




Dependent

16.




Derived

17.




Designated

18.




Destruction Responsible

19.




Detailed

20.




Economic

21.




Effective

22.




enumeration

23.




Excluded

24.




Exclusive

25.




Fax

26.




Fiscal

27.




has type

28.




Identified

29.




IFRS

30.




Included

31.




Inclusive

32.




Information

33.




Input Responsible

34.




Intermediate

35.




Issue

36.




Justification

37.




Justified

38.




Life Cycle

39.




Linked

40.




Location

41.




Lodgement

42.




Main

43.




Offsetting

44.




Opening Responsible

45.




Originator

46.




Owner

47.




Parent

48.




Payer Agent

49.




Postal

50.




Preparer

51.




Primary

52.




Production

53.




Provided

54.




RDM-CC

55.




RDM-SAFT

56.




RDM-XBRL

57.




Recipient

58.




Reference

59.




Referenced

60.




Related

61.




Repeated

62.




Representative

63.




Responsible

64.




Sender

65.




Servicer

66.




Servicing

67.




Signatory

68.




Specified

69.




Subordinate

70.




Telephone

71.




Trusted Third Party

72.




Update Authorized

73.




URI

74.



Related

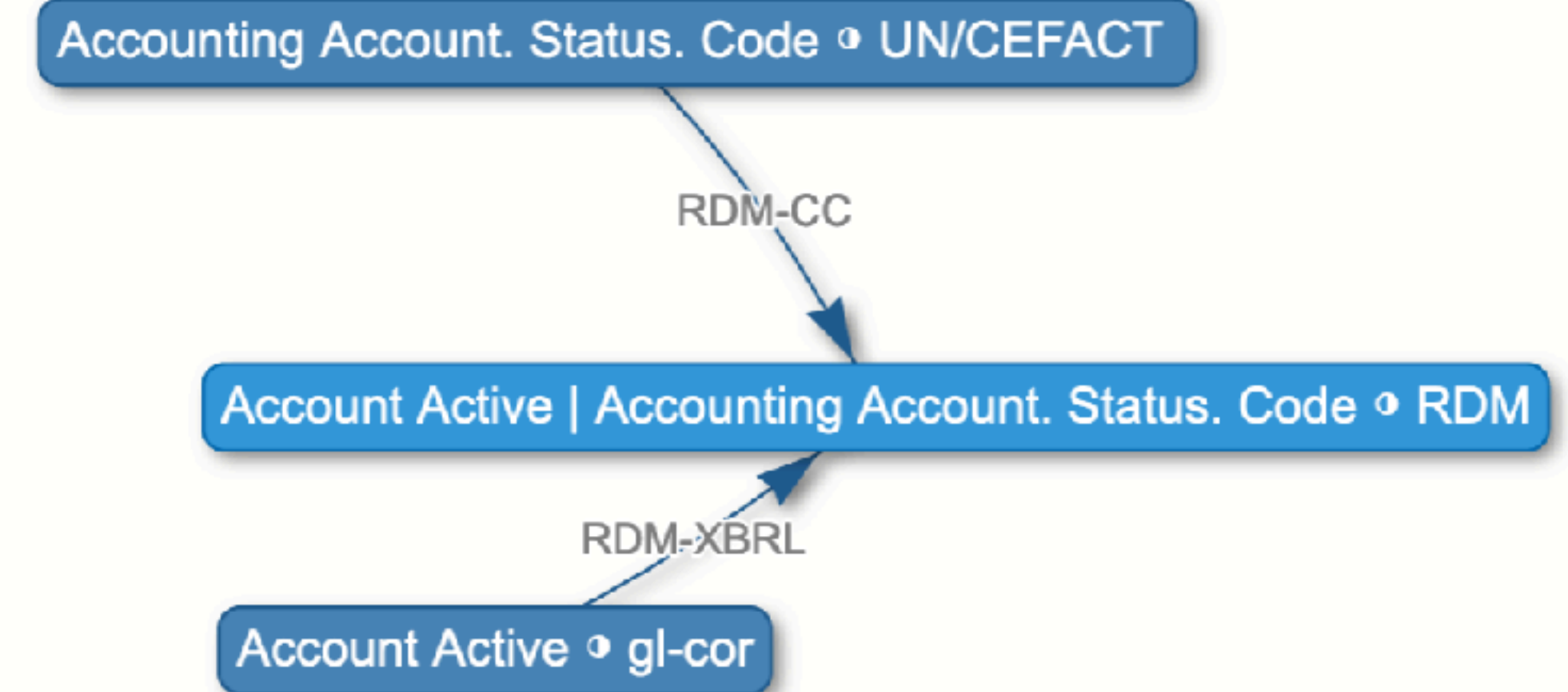
75.



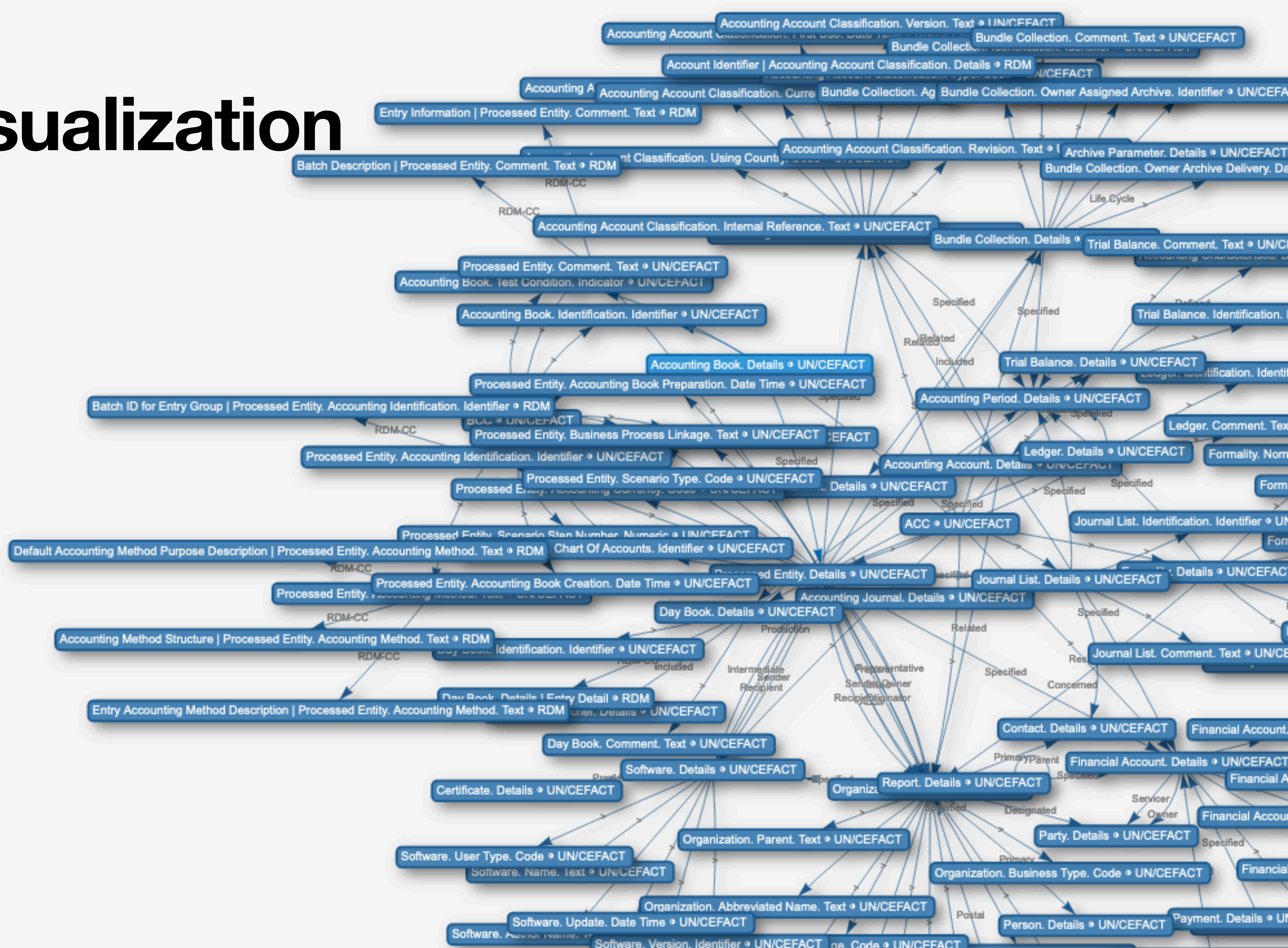
Broader

# Multipoint Mapping

- Hub Topics are created with the scope "RDM" to express the mapping. Their name is using a convention that makes it more explicit.
- Example: **Account Active** (XBRL gl-cor) is mapped to **Account Account. Status. Code** (UN/CEFACT Core Component).
- The relationship semantics RDM-XBRL and RDM-CC indicate the way these topics are related



# Graph Visualization



# Conceptual Foundation

- ISO/IEC 13250 Topic Maps
  - Graph of interconnected topics
  - Each topic can have several names
  - Each name can have a scope
  - Relationships between topics have an open semantic, indicated by "roles", which are topics.
  - Relationships are reified, i.e. they can themselves be considered as topics.

# User Interfaces

- Designed to be usable without learning underlying technologies.
- Classic interface:
  - Synonyms, Multilingual names and notes, Taxonomy Lineage
- Supplementary Graph interface
  - Editable topics and relationships.
- Pre-defined queries:
  - Alphabetic indices, Topics by scopes, Relationships by roles, Topics by languages, Reified relationships, etc.

# Import

- From Spreadsheets
  - CC
  - XBRL-GL
- From XML
  - SAF-T

```
data_dict = get_spreadsheet_data(filename, sheets)
data = data_dict['CC']

acc = topic('ACC')
bcc = topic('BCC')

# Processing ACC, BCC
for row in data:
    col = data[row]
    if col["D"] and col["A"]:
        # ACC
        if col['B'] in ['ACC']:
            current_acc = topic(name=f"{col['D']}. Details", scope=col['A'])
            relation(acc, current_acc, broader())
            topic_description(current_acc, col)

        # BCC
        if col['B'] in ['BCC']:
            if col['F'].strip():
                current_bcc = topic(name=f"{col['D']}. {col['E']}. {col['F']}", scope=col['A'])
            else:
                current_bcc = topic(name=f"{col['D']}. {col['E']}")
            relation(bcc, current_bcc, broader())
            topic_description(current_bcc, col)
            relation(current_acc, current_bcc, broader())

# ASCC
print('Processing ASCC')
for row in data:
    col = data[row]
    # Create a relation between
    # col D and col G
    # with role from col E.
    if col["B"] == 'ASCC':
        if col['D'] and col['G']:
            try:
                hit_from = Hit.objects.get(name=f'{col["D"]}. Details')
            except ValueError:
                print(f'ERROR More than one case for {col["D"]}. Details')
                continue
            from_ = hit_from.basket

            try:
                hit_to = Hit.objects.get(name=f'{col["G"]}. Details')
            except ValueError:
                print(f'ERROR More than one case for {col["G"]}. Details')
            to_ = hit_to.basket
            if col['E'].strip():
                role = topic(col['E'])
                ascc = relation(from_, to_, role)
            else:
                ascc = relation(from_, to_)
            ascc_basket = ascc.relationBasket
            description(ascc_basket, f"Definition: {col['C']}, Occurrence Indicators: min {col['H']}
max:{col['I']}, Source: {col['K']}, Description: {col['L']}")
```

# Export

- Multiple formats available
- Needs customization to comply with deliverable requirements.

🔄 HTML

🔄 JSON

🔄 XML

🔄 CSV

🔄 MARKDOWN

🔄 DOCX

🔄 TEXT

🔄 PROPERTY GRAPH

🔄 HTML WEB SITE















🔄 CONTENTS

```
-<topic id="2207">
  <name id="t2207">Accountant Contact Email Address • gl-bus</name>
  -<synonyms>
    Adresse courriel du contact du comptable, Correo Electrónico del Contable, Endereço
    Eletrônico Contato do Contador, gl-bus:accountantContactEmailAddress, SM/SMMM/YMM
    irtibat e-Posta Adresi, 会計事務所担当者Eメールアドレス, 会计人员联系电子邮件地址
  </synonyms>
  -<outbound>
    -<relation id="1542" direction="to">
      <role>has type</role>
      <related id="2506">emailAddressItemType • gl-gen</related>
    </relation>
    -<relation id="2331" direction="to">
      <role>RDM-XBRL</role>
      -<related id="4475">
        Accountant Contact Email Address | Communication. URI. Identifier | Contact Email
        Address • RDM
      </related>
    </relation>
  </outbound>
  -<inbound>
    -<relation id="1541" direction="from">
      <role>></role>
      <related id="2094">Contact Email Address Structure • gl-bus</related>
    </relation>
  </inbound>
  <weblinks/>
  -<descriptions>
    -<description>
      SM/SMMM/YMM irtibat e-postaadresinin bulunduğu alandır. Kullanım: SM/SMMM/YMM
      irtibat e-postaadresini bu alana yazılacaktır.
    </description>
    <description>会计人员联系电子邮件的地址。</description>
  </descriptions>
  -<description>
    Indirizzo e-mail dell'incaricato contabile descritto in 'emailAddressUsage' (descrizione
    dell'indirizzo e-mail).
  </description>
```

# Mappings
















## RDM-CC

(117 relations)

#	Relation Topic	Topic 1	Role
1.		Accounting Account Boundary. First Sub-Account Identification. Identifier ◦ UN/CEFACT	RDM-CC
2.		Accounting Account Boundary. Last Sub-Account Identification. Identifier ◦ UN/CEFACT	RDM-CC
3.		Accounting Account Classification. Details ◦ UN/CEFACT	RDM-CC
4.		Accounting Account Classification. Type. Code ◦ UN/CEFACT	RDM-CC
5.		Accounting Account Classification. Type. Code ◦ UN/CEFACT	RDM-CC
6.		Accounting Account Classification. Type. Code ◦ UN/CEFACT	RDM-CC
7.		Accounting Account Classification. Type. Code ◦ UN/CEFACT	RDM-CC
8.		Accounting Account Classification. Type. Code ◦ UN/CEFACT	RDM-CC
9.		Accounting Account Classification. Type. Code ◦ UN/CEFACT	RDM-CC
10.		Accounting Account Classification. Type. Code ◦ UN/CEFACT	RDM-CC
11.		Accounting Account Classification. Type. Code ◦ UN/CEFACT	RDM-CC
12.		Accounting Account Classification. Type. Code ◦ UN/CEFACT	RDM-CC
13.		Accounting Account Classification. Type. Code ◦ UN/CEFACT	RDM-CC
14.		Accounting Account Classification. Type. Code ◦ UN/CEFACT	RDM-CC











## RDM-XBRL

(144 relations)

#	Relation Topic	Topic 1	Role
1.		Account Active ◦ gl-cor	RDM-CC
2.		Account Classification Description ◦ gl-cor	RDM-CC
3.		Account Classification ◦ asset ◦ gl-cor enumeration	RDM-CC
4.		Account Classification ◦ comprehensive ◦ gl-cor / enumeration	RDM-CC
5.		Account Classification ◦ contr-to-equity ◦ gl-cor / enumeration	RDM-CC
6.		Account Classification ◦ distr-from-equity ◦ gl-cor / enumeration	RDM-CC
7.		Account Classification ◦ equity ◦ gl-cor enumeration	RDM-CC
8.		Account Classification ◦ expense ◦ gl-cor enumeration	RDM-CC
9.		Account Classification ◦ gain ◦ gl-cor enumeration	RDM-CC
10.		Account Classification ◦ income ◦ gl-cor enumeration	RDM-CC
11.		Account Classification ◦ liability ◦ gl-cor enumeration	RDM-CC
12.		Account Classification ◦ loss ◦ gl-cor enumeration	RDM-CC
13.		Account Classification ◦ other ◦ gl-cor enumeration	RDM-CC
14.		Account Identifier ◦ gl-cor	RDM-CC
15.		Account Type Description ◦ gl-cor	RDM-CC
Account Classification. Type. Code (code value 1) ◦ RDM			
Account Classification ◦ asset   Accounting Account Classification. Type. Code (code value 5) ◦ RDM			

## RDM-SAFT

(68 relations)

#	Relation Topic	Topic 1	Role	Topic 2
1.		AccountCreationDate ◦ SAF-T	RDM-SAFT	Accounting Account. Opening. Date Time   AccountCreationDate ◦ RDM
2.		AccountDescription ◦ SAF-T	RDM-SAFT	Accounting Account. Name. Text   Main Account Description ◦ RDM
3.		Accounting Account Pattern. Identification. Identifier   Subaccount ◦ RDM	RDM-SAFT	AnalysisID ◦ SAF-T
4.		Accounting Account. Abbreviated Name. Text   Subaccount Description ◦ RDM	RDM-SAFT	AnalysisTypeDescription ◦ SAF-T
5.		Accounting Account. Identification. Identifier   Main Account Number ◦ RDM	RDM-SAFT	AccountID ◦ SAF-T
6.		Accounting Account. Name. Text   Main Account Description ◦ RDM	RDM-SAFT	AccountDescription ◦ SAF-T
7.		Accounting Account. Nature. Code   Type of Subaccount ◦ RDM	RDM-SAFT	AnalysisType ◦ SAF-T
8.		Accounting Entry. Validation. Date Time   Date Posted ◦ RDM	RDM-SAFT	SystemEntryDate ◦ SAF-T
9.		Accounting Line Monetary Value. Alternate Currency Amount Type. Code   Currency ◦ RDM	RDM-SAFT	CurrencyCode ◦ SAF-T
10.		Accounting Line Monetary Value. Alternate Currency. Amount   Accounting Line Monetary Value. Voucher Currency. Amount   Amount in Original Currency ◦ RDM	RDM-SAFT	CurrencyAmount ◦ SAF-T
11.		Accounting Voucher. Identification. Identifier   Document Number ◦ RDM	RDM-SAFT	TransactionID ◦ SAF-T
12.		Address Detail   Address. Details ◦ RDM	RDM-SAFT	AdditionalAddressDetail ◦ SAF-T
13.		Address Name   Organization. Abbreviated Name. Text   Organization. Name. Text ◦ RDM	RDM-SAFT	Name ◦ SAF-T
14.		Address. Line One. Text   Building Number ◦ RDM	RDM-SAFT	Number ◦ SAF-T
15.		AddressType Identifier Address Purpose ◦ RDM	RDM-SAFT	AddressType ◦ SAF-T
16.		Amount Monetary Amount ◦ RDM	RDM-SAFT	Amount ◦ SAF-T