What is GSIM?

- The Generic Statistical Information Model (GSIM) is the first internationally endorsed reference framework for statistical information. It provides **a set of standardised, consistently described information objects**, which can be used as inputs and outputs in the design and the production of statistics.

- A significant benefit of using GSIM is that it provides a **common language to improve communication at different levels**:
  - Between the different roles in statistical business process (business and information technology experts);
  - Between the different statistical subject matter domains;
  - Between statistical organisations at national and international levels.

- GSIM provides the foundation for in-depth collaboration, standardisation, or, sharing of tools and methods.

- GSIM is related to the Generic Statistical Business Process Model (GSBPM). GSIM objects can be used for inputs and outputs of each GSBPM sub-processes.

- Statistics Canada has officially adopted GSIM as a model, same as GSBPM.

- Source: https://statswiki.unece.org/display/gsim/ (Under the UNECE umbrella)

Documenting changes in classification versions using GSIM

- GSIM contains objects which specify information about the real world – "information objects", around 130 of them (e.g., data and metadata - such as statistical classifications - as well as the rules and parameter inputs needed for production processes to run - for example, data editing rules).

- This presentation only concentrates on a tiny part of GSIM, which is related to 'Statistical Classification Model', an defines the key concepts that are relevant to structuring statistical classification metadata, and provides the conceptual framework for the development of a statistical classification management system. It is aimed at classification experts.

- The Statistical Classification Model contains definitions of object types such as: Classification family, Classification series, Statistical Classification, Level, Correspondence table, Classification index and index entry, Classification item, etc.

- **The Statistical Classification Model also contains a specific section on A Typology of Classification Item changes. This is what we are using here with concrete examples to document changes between ISIC Rev 4 and ISIC Rev 5.**

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Types of changes in the classification, including Codes, Titles and Classification Items (Based on GSIM)

VC - VIRTUAL CHANGE	Virtual change stands for changes in coding and/or naming, while the meaning of the classification item remains the same. Code change and name change do not result in border/scope changes of the classification item.
RC - REAL CHANGE	Real change stands for changes in meaning, whether or not accompanied by changes in naming (title or definition) and/or coding.
NC- NOTIFICATION CHANGE	A classification item stays the same while changes are made at lower levels without change in scope. – *This is not in GSIM (Adaptation at Statistics Canada)*

GSIM – Classification change categories

- **REAL CHANGE**
  - DELETION
  - CREATION
  - COMBINATION
    - Merger
    - Take-over
  - DECOMPOSITION
    - Breakdown
    - Split off
  - TRANSFER

- **VIRTUAL CHANGE**
  - CODE CHANGE
  - NAME CHANGE

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Applying GSIM Typology For ISIC Rev 4 to ISIC Rev 5

- Used to identify the type of changes from ISIC Rev 4 to ISIC Rev 5
- Enabled the production of a clear and (machine) readable correspondence table
- Helps produce consistent and repeatable explanatory notes
- Could be implemented in a machine readable format or embedded in a classification management software (e.g., Aria used by Statistics Canada)

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VC - Virtual Change in ISIC Rev 5 (examples)

VC1 - CODE CHANGE

- A classification item expires, while its denotation(content) proceeds as the denotation(content) of an emerging(new) classification item.
  - In fact, for a code change to be part of virtual change, the code of a classification item changes, while its denotation (content including its borders and scope) remains the same.

VC2 - NAME CHANGE

- The name (title or definition) of a classification item changes, while its denotation (content including its borders and scope) remains the same.
  - Note that not all changes in (the wording of) definitions imply changes in meaning. Indeed, changes which "merely" intend to enhance the clarity or quality of a title and/or definition, or to further operationalise a definition on the basis of situations encountered in practice, do not affect the meaning of a classification item.

"Denotation" = primary meaning/content of a classification item

VC1 – Code Change

ISIC Rev 4 Code	ISIC Rev 4 Title	GSIM Type of Change	ISIC Rev 5 Code	ISIC Rev 5 Title	Explanatory Notes
4661	Wholesale of solid, liquid and gaseous fuels and related products	VC1 - Code Change	4671	Wholesale of solid, liquid and gaseous fuels and related products	Code modification.

Remember: For a code change to be part of virtual change, the code of a classification item changes, while its denotation (content including its borders and scope) remains the same.

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VC2 – Name Change (title or definition)

ISIC Rev 4 Code	ISIC Rev 4 Title	GSIM Type of Change	ISIC Rev 5 Code	ISIC Rev 5 Title	Explanatory Notes
4100	Construction of buildings	VC2 - Name Change	4100	Construction of residential and non-residential buildings	Title modification, no change in scope.
5911	Motion picture, video and television programme production activities	VC2 -Name Change	5911	Motion picture, video and television programme production activities	Explanatory notes modification

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VC1 – Code Change / VC2 – Name Change (title or/and definition)

ISIC Rev 4 Code	ISIC Rev 4 Title	GSIM Type of Change	ISIC Rev 5 Code	ISIC Rev 5 Title	Explantory Notes
4669	Wholesale of waste and scrap and other products n.e.c.	VC1 - Code Change, VC2 - Name Change	46**79**	Wholesale of **chemicals**, waste and scrap and other products n.e.c.	4669 continues as 4679. Title modification.
6391	News agency activities	VC1 - Code Change, VC2 - Name Change	**6030**	New agency activities	6391 continues as 6030. Explanatory notes modification.

In these scenarios the code was changed (VC1); and the title or explanatory notes were also modified, hence the VC2 type change. Of course, no change in scope.

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RC - Real Change in ISIC Rev 5 (examples)

"Denotation" = primary meaning/content of a classification item

Real change stands for changes in meaning, whether or not accompanied by changes in naming (title or definition) and/or coding.

RC1 - DELETION	A classification item expires, while its denotation(content) reduces to zero; it does not proceed as (part of the) denotation(content) of one or more other (existing) classification item(s).
RC2 - CREATION	The mirror image of deletion: a classification item emerges, while its denotation(content) is not (part of) the denotation(content) of one or more existing classification items.

We did not have any instances of RC1 in the ISIC Rev 4 to ISIC Rev 5 correspondence table. One case was flagged as RC2: **class 6039** - Social network sites and other content distribution activities; this because it would have been very difficult to link it to a specific class back to ISIC Rev 4, although the classification is considered exhaustive.

Those two cases should be rare for an established classification such as ISIC or even for any well developed classification because of the principal of 'exhaustiveness'.

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RC - Real Change in ISIC Rev 5 (examples)

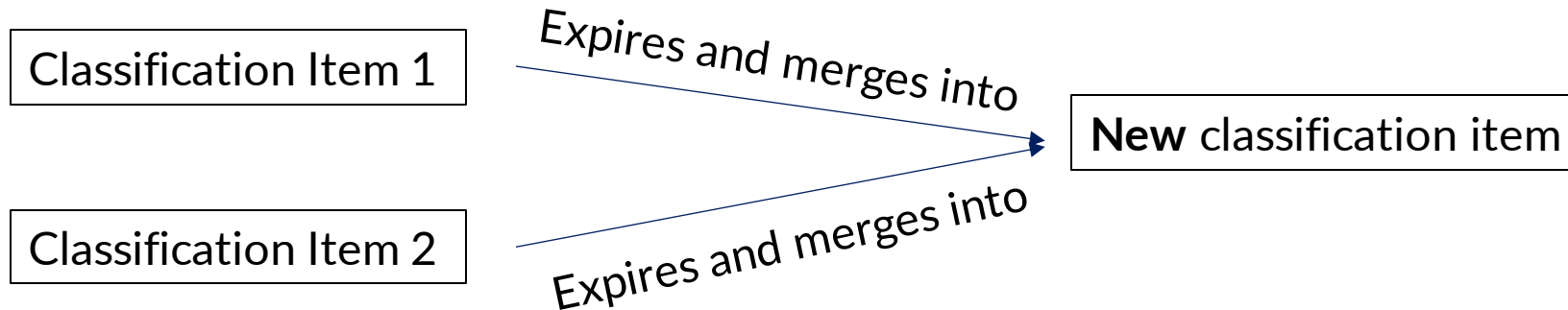"Denotation" = primary meaning/content of a classification item

Real change stands for changes in meaning, whether or not accompanied by changes in naming (title or definition) and/or coding.

RC3 - **COMBINATION**	
RC3.1 - Merger	Two or more classification items expire, while their denotations (content) proceed in one emerging **(new)** classification item.
RC3.2 - Take-over	A classification item expires, while its denotation (content) proceeds as part of the denotation (content) of another **already existing** classification item.

RC3.1 - Merger

RC3 - COMBINATION	
RC3.1 - Merger	Two or more classification items expire, while their denotations (content) proceed in one emerging **(new)** classification item.

Classification Item 1 — *Expires and merges into* → **New** classification item

Classification Item 2 — *Expires and merges into* →

RC3.1 - Merger

RC3.1 - Merger	Two or more classification items expire, while their denotations (content) proceed in one emerging **(new)** classification item.

ISIC Rev 4 Code	ISIC Rev 4 Title	GSIM Type of Change	ISIC Rev 5 Code	ISIC Rev 5 Title	Explanatory Notes
6312	Web portals	RC3.1 - Merger	6390	Web search portals activities and other information service activities	Classes 6312 and 6399 expire while their activities proceed as part of the emerging class 6390.
6399	Other information service activities n.e.c.	RC3.1 - Merger	6390	Web search portals activities and other information service activities	Classes 6312 and 6399 expire while their activities proceed as part of the emerging class 6390.

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RC3.2 – Take-over

RC3 - COMBINATION	
RC3.2 - Take-over	A classification item expires, while its denotation (content) proceeds as part of the denotation (content) of another **already existing** classification item.

Classification Item 1 → **Existing** classification item + content of item 1

expires and content is taken over by

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RC3.2 – Take-over

RC3.2 - Take-over	A classification item expires, while its denotation (content) proceeds as part of the denotation (content) of another **already existing** classification item.

ISIC Rev 4 Code	ISIC Rev 4 Title	GSIM Type of Change	ISIC Rev 5 Code	ISIC Rev 5 Title	Explanatory Notes
45	Wholesale and retail trade and repair of motor vehicles and motorcycles	RC3.2 - Take-over	46	Wholesale trade	Division 45 expired while its activities proceed as parts of existing Divisions 46 (wholesale trade of motor vehicles and motorcycles), 47 (retail trade of motor vehicles and motorcycles) and 95 (repair and maintenance services for motor vehicles and motorcycles).

Illustration here that we can do correspondences at the higher level of the classification, compare the usual lowest level only. Ex-Division 45 is linked to Divisions 46, 47 and 95.

RC3.2 – Take-over

RC3.2 - Take-over	A classification item expires, while its denotation (content) proceeds as part of the denotation (content) of another **already existing** classification item.

ISIC Rev 4 Code	ISIC Rev 4 Title	GSIM Type of Change	ISIC Rev 5 Code	ISIC Rev 5 Title	Explanatory Notes
4781	Retail sale via stalls and markets of food, beverages and tobacco products	RC3.2 - Take-over	4711	Non-specialized retail sale, with food, beverages or tobacco predominating	Class 4781 expires, while its content proceeds as part of the scope of existing classes 4711, 4721, 4722 and 4723 which continue their existence

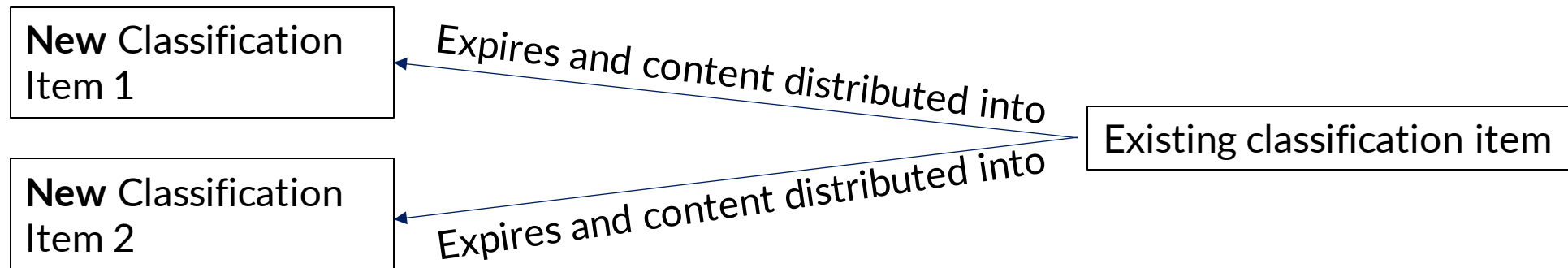Here class 4781 is linked to classes 4711, 4721, 4722 and 4723.

RC - Real Change in ISIC Rev 5 (examples)

RC4 - **DECOMPOSITION**	
RC4.1 - Breakdown	The mirror image of merger: a classification item expires, while its denotation (content) is distributed over and proceeds in two or more emerging **(new)** classification items.
RC4.2 - Split off	The mirror image of take-over: a classification **item continues to exist**, while part of its denotation (content) moves to another (emerging/new) classification item.
RC5 - Transfer	1.Part of the denotation(content) of an item moves to another (existing) item. Notes: More than one classification item may be involved in the relationship between the old and new structure. 2."Transfer" can also be applied at higher levels of a classification. In such cases the part of the denotation that moves (to another (existing) item) corresponds to an item at the lower level.

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RC4.1 - Breakdown

RC4 - DECOMPOSITION	
RC4.1 - Breakdown	The mirror image of merger: a classification item expires, while its denotation (content) is distributed over and proceeds in two or more emerging **(new)** classification items.

New Classification Item 1

New Classification Item 2

Expires and content distributed into

Expires and content distributed into

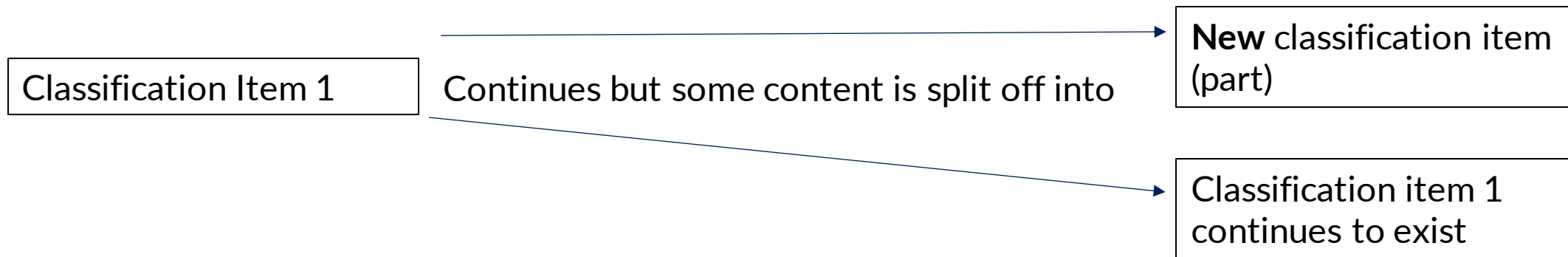Existing classification item

RC4.1 - Breakdown

RC4.1 - Breakdown	The mirror image of merger: a classification item expires, while its denotation (content) is distributed over and proceeds in two or more emerging **(new)** classification items.

ISIC Rev 4 Code	ISIC Rev 4 Title	GSIM Type of Change	ISIC Rev 5 Code	ISIC Rev 5 Title	Explanatory Notes
9000	Creative, arts and entertainment activities	RC4.1 - Breakdown	9011	Literary creation and musical composition activities	Class 9000 expires while the activities are distributed over and proceeds in 7 emerging classes (9011, 9012, 9013, 9020, 9031, 9039 and 9130).
9000	Creative, arts and entertainment activities	RC4.1 - Breakdown	9012	Visual arts creation activities	Class 9000 expires while the activities are distributed over and proceeds in 7 emerging classes (9011, 9012, 9013, 9020, 9031, 9039 and 9130).
9000	Creative, arts and entertainment activities	RC4.1 - Breakdown	9013	Other arts creation activities	Class 9000 expires while the activities are distributed over and proceeds in 7 emerging classes (9011, 9012, 9013, 9020, 9031, 9039 and 9130).

Here class 9000 is linked to classes 9011, 9012, 9013, 9020, 9031, 9039 and 9130

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RC4.2 – Split off

RC4 - DECOMPOSITION	
RC4.2 - Split off	The mirror image of take-over: a classification **item continues to exist**, while part of its denotation (content) moves to another (emerging/new) classification item.

Classification Item 1 — Continues but some content is split off into →

New classification item (part)

Classification item 1 continues to exist

RC4.2 – Split off

RC4 - DECOMPOSITION	
RC4.2 - Split off	The mirror image of take-over: a classification **item continues to exist**, while part of its denotation (content) moves to another (emerging/new) classification item.

ISIC Rev 4 Code	ISIC Rev 4 Title	GSIM Type of Change	ISIC Rev 5 Code	ISIC Rev 5 Title	Explanatory Notes
1079	Manufacture of other food products n.e.c.	RC4.2 - Split off	1076	Processing of coffee and tea	Class 1079 continues to exist while parts of its activities are moved to emerging class 1076.
1079	Manufacture of other food products n.e.c.	RC4.2 - Split off	1079	Manufacture of other food products n.e.c.	Class 1079 continues to exist while parts of its activities are moved to emerging class 1076.

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RC5 – Transfer

RC5 - TRANSFER	1.Part of the denotation(content) of an item moves to another (existing) item. Notes: More than one classification item may be involved in the relationship between the old and new structure. 2."Transfer" can also be applied at higher levels of a classification. In such cases the part of the denotation that moves (to another (existing) item) corresponds to an item at the lower level.

Existing Classification Item $\longrightarrow$ **Existing** classification item

Continues but some content is transferred to

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RC5 – Transfer

RC5 - Transfer	1. Part of the denotation(content) of an item moves to another (existing) item. Notes: More than one classification item may be involved in the relationship between the old and new structure. 2. "Transfer" can also be applied at higher levels of a classification. In such cases the part of the denotation that moves (to another (existing) item) corresponds to an item at the lower level.

ISIC Rev 4 Code	ISIC Rev 4 Title	GSIM Type of Change	ISIC Rev 5 Code	ISIC Rev 5 Title	Explanatory Notes
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	RC5 - Transfer	T	Other service activities	Section G continues to exist while part of its activities (repair and maintenance of motor vehicles and motorcycles) are moved to the existing Section S, which is recoded to T. Also downloads of software activities are moved to the existing Section J.

Illustration here that we can do correspondences at the higher level of the classification, compare the usual lowest level only. Section G is linked to Sections G, J, T.

RC5 – Transfer

RC5 – TRANSFER Notes: More than one classification item may be involved in the relationship between the old and new structure.	1.Part of the denotation (content) of an item moves to another (existing) item. "Transfer" can also be applied at higher levels of a classification. In such cases the part of the denotation that moves (to another (existing) item) corresponds to an item at the lower level.

ISIC Rev 4 Code	ISIC Rev 4 Title	GSIM Type of Change	ISIC Rev 5 Code	ISIC Rev 5 Title	Explanatory Notes
6311	Data processing, hosting and related activities	RC5 - Transfer	5912	Motion picture, video and television programme post-production activities	Class 6311 continues as class 6310, and post-production video and audio conversion to streaming formats activities are moved from class 6311 respectively to existing classes 5912 and 5920. Code, Title and Explanatory notes modification.

Combinations of types of changes can occur simultaneously

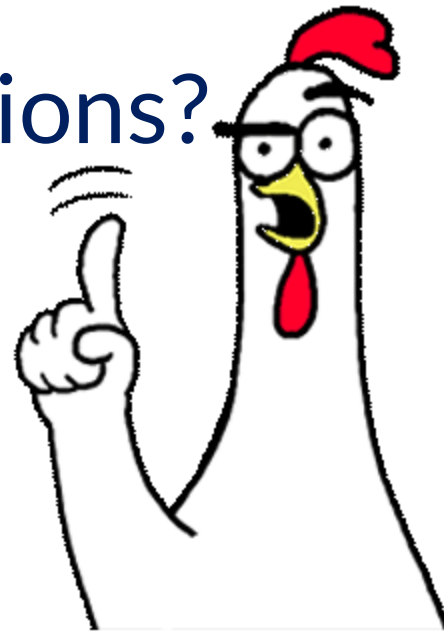| ISIC Rev 4 Code	ISIC Rev 4 Title	GSIM Type of Change	ISIC Rev 5 Code	ISIC Rev 5 Title	Explanatory Notes
4741	Retail sale of computers, peripheral units, software and telecommunications equipment in specialized stores	RC4.2 - Split off; RC3.2 - Take-over; RC3.1 - Merger	4740	Retail sale of information and communication equipment	Part of activities (intermediation) in class 4741 are moved to emerging class 4790. Classes under groups 478 and 479 expired as they existed in ISIC Rev 4 (these codes are re-used with different content) and parts of the activities are move to existing class 4741. Then classes 4741 and 4742 are merged to form the new class 4740.
4742	Retail sale of audio and video equipment in specialized stores	RC4.2 - Split off; RC3.2 - Take-over; RC3.1 - Merger	4740	Retail sale of information and communication equipment	Part of activities (intermediation) in class 4742 are moved to emerging class 4790. Classes under groups 478 and 479 expired as they existed in ISIC Rev 4 (these codes are re-used with different content) and parts of the activities are move to existing class 4742. Then classes 4741 and 4742 are merged to form the new class 4740.

Combinations of types of changes can occur simultaneously (2)

ISIC Rev 4 Code	ISIC Rev 4 Title	GSIM Type of Change	ISIC Rev 5 Code	ISIC Rev 5 Title	Explanatory Notes
4791	Retail sale via mail order houses or via Internet	RC3.2 - Take-over	4740	Retail sale of information and communication equipment	Class 4791 expires, while its content proceeds as part of the scope of existing classes 4711, 4719, 4721, 4722, 4723, 4730, 4741, 4742, 4751, 4752, 4753, 4759, 4761, 4762, 4763, 4764, 4771, 4772 and 4774, which continue their existence. Then classes 4741 and 4742 were merged into 4740, and class 4762 is merged with 4769, and classes were recoded: ex-4763 becomes 4762; ex-4764 becomes 4763..
4799	Other retail sale not in stores, stalls or markets	RC3.2 - Take-over	4740	Retail sale of information and communication equipment	Class 4799 expires, while its content proceeds as part of the scope of existing classes 4711, 4719, 4721, 4722, 4723, 4730, 4741, 4742, 4751, 4752, 4753, 4759, 4761, 4762, 4763, 4764, 4771, 4772 and 4774, which continue their existence. Then classes 4741 and 4742 were merged into 4740, and class 4762 is merged with 4769, and classes were recoded: ex-4763 becomes 4762; ex-4764 becomes 4763.

Questions?