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(OECD)**

### **POSSIBLE ISIC CODIFYING SYSTEMS**

Supporting paper submitted by the United Nations Statistics Department, New York

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\* Paper posted on Internet as submitted by the United Nations Statistics Department, New York.

## POSSIBLE ISIC CODIFYING SYSTEMS

This document outlines different options for applying a coding system to ISIC. At this point, this is just an illustration of different options and no specific recommendation in favour of any of these options has been made by the Technical Subgroup.

While the coding may not necessarily affect the structure of the classification, there are other reasons that influence decisions on the coding system used. Many classifications use pure numerical coding systems, making relations between codes at varying levels more intuitive and easier to handle in most database systems. The use of letters (A,B,...) at the highest level of ISIC Rev.3 has been criticized by many countries. However, given the fact that ISIC Rev.3 uses 17 categories at the top level, a single digit code at this level could not be used.

An additional concern is the length of the codes being used. Codes that are longer than those in previous ISIC versions may result in additional implementation costs. For instance, if data is stored in sequential files, all computer routines accessing data in such files may need to be rewritten.

Similar questions have to be asked for ISIC Rev.4. The current proposal shows 22 categories at the top level of the classification, as set out in the separate document on the ISIC structure. If the proposed high-level aggregation of about 10 categories (see Part II of the ISIC structure paper) becomes part of the classification, additional constraints will apply.

An additional problem presents itself in the area of Manufacturing. The current draft structure for ISIC Rev.4 shows 16 divisions in Manufacturing. Therefore, a simple extension of the code by one digit (if a pure numerical code is used) is not sufficient. Alternatives include the use of letters (as in ISIC Rev.3) or a splitting of Manufacturing in several subcategories.

Many codifying systems are possible, depending on the tree structure shape as well as creating constraints on the structure depending on the chosen systems. We try here to provide a broad view of the various codifying systems depending on the choices and their consequences.

The following options are discussed in this paper:

1. Numerical, assuming 22 items at the top level
2. Use of letters for top categories, assuming 22 items at top level
3. Use of numbers for top level, assuming inclusion of an additional top level
4. Use of letters for top levels, assuming inclusion of an additional top level
5. Additional "intermediate" level for manufacturing activities

### **1 - Numerical, assuming 22 items at the top level**

1a - If we consider the "basis" of the structure is the "22 item level" and that the codifying system is based on a 4-digit numeric code, we get the following. The top level has to be coded with two digits, as it covers more than ten categories.

(the last level just is provided as example; the example just covers the beginning of the classification)

**01 Agriculture, hunting, fishing, forestry**

- 011 Agriculture and related services
  - 0111 *Crop production; market gardening; horticulture*
  - 0112 *Animal production*
  - 0113 *Mixed agriculture*
  - 0115 *Incidental services to agriculture*
- 012 Fish farming
  - 0121 *Open sea fish farming*
  - 0122 *Other fish farming*
- 013 Fishing
  - 0131 *Deep sea fishing*
  - 0132 *Costal and lagoon fishing*
  - 0133 *Lake and river fishing*
- 014 Hunting and trapping
  - 0140 *Hunting and trapping*
- 015 Forestry and logging
  - 0151 *Forestry*
  - 0152 *Logging*
  - 0153 *Incidental services to forestry and logging*

**02 Mining and quarrying**

- 021 Mining and extracting coal, lignite and peat
    - 0211 *Mining and extracting coal*
    - 0212 *Mining and extracting lignite*
    - 0213 *Mining and extracting peat*
    - 0214 *Incidental services to coal, lignite and peat extraction*
  - 022 *Extracting crude petroleum and natural gas (incl. Incidental services)*
    - 0221 *Extracting crude petroleum and natural gas*
    - 0222 *Incidental services to crude petroleum and natural gas extraction*
  - 023 Mining and quarrying metallic ores
    - 0231 *Mining uranium and thorium*
    - 0232 *Mining and quarrying ferrous ores*
    - 0233 *Mining and quarrying non-ferrous ores*
  - 024 Mining and Quarrying non-metallic ores
    - 0241 *Mining and quarrying stones, sand and clays*
    - 0242 *Mining and quarrying chemical and fertilizer minerals*
    - 0243 *Production of salt*
    - 0244 *Other mining and quarrying n.e.c.*
- etc.

All the details presently in ISIC Rev.3 are not possible to code, as there is not enough space in the four digit code. To accommodate the current ISIC detail, a 5-digit code would have to be used. This becomes even more obvious in the Manufacturing domain.

1b - If we want to increase the detail of ISIC (for instance to account for the current detail in ISIC Rev.3, possibly even more), with the same basis structure, we need a fourth level that means a 5-digit level:

**01 Agriculture, hunting, fishing, forestry**

- 011 Agriculture and related services
    - 0111 *Crop production; market gardening; horticulture*
      - 01111 Growing of cereals and other crops n.e.c.
      - 01112 Growing of vegetables, horticultural specialties and nursery products
      - 01113 Growing of fruit, nuts, beverage and spice crops
    - 0112 *Animal production*
      - 01121 Farming of cattle, sheep, goats, horses, asses, mules and hinnies; dairy farming
      - 01129 Other animal farming; production of animal products n.e.c.
    - 0113 *Mixed agriculture*
      - 01130 Mixed agriculture
    - 0114 *Incidental services to agriculture*
      - 01150 Incidental services to agriculture
  - 012 Fish farming
    - 0121 *Open sea fish farming*
      - 01210 Open sea fish farming
    - 0122 *Other fish farming*
      - 01220 Other fish farming
  - 013 Fishing
    - 0130 *Fishing*
      - 01301 Deep sea fishing
      - 01302 Coastal and lagoon fishing
      - 01303 Lake and river fishing
  - 014 Hunting and trapping
    - 0140 *Hunting and trapping*
      - 01400 Hunting and trapping
  - 015 Forestry and logging
    - 0151 *Forestry*
      - 01510 Forestry
    - 0152 *Logging*
      - 01520 Logging
    - 0153 *Incidental services to forestry and logging*
      - 01530 Incidental services to forestry and logging
- etc.

The same detail as presently used in ISIC Rev.3 is possible (even more detailed than presently as shown in Fishing and Fish farming) but with 5 numeric digits (not always necessary).

1c - To get the same detailed result with only 4 digits is almost possible by fully using the second and third level. That means to split either at the second level (3 digits) or/and at the third level (4 digit). In such a case, a part of the structure is lost:

**01 Agriculture, hunting, fishing, forestry**

- 011 Agriculture and related services
    - 0111 *Growing of cereals and other crops n.e.c.*
    - 0112 *Growing of vegetables, horticultural specialties and nursery products*
    - 0113 *Growing of fruit, nuts, beverage and spice crops*
    - 0114 *Farming of cattle, sheep, goats, horses, asses, mules and hinnies; dairy farming*
    - 0115 *Other animal farming; production of animal products n.e.c.*
    - 0116 *Mixed agriculture*
    - 0117 *Incidental services to agriculture*
  
  - 012 Fish farming
    - 0121 *Open sea fish farming*
    - 0122 *Other fish farming*
  
  - 013 Fishing
    - 0131 *Deep sea fishing*
    - 0132 *Costal and lagoon fishing*
    - 0133 *Lake and river fishing*
  
  - 014 Hunting and trapping
    - 0140 *Hunting and trapping*
  
  - 015 Forestry and logging
    - 0151 *Forestry*
    - 0152 *Logging*
    - 0153 *Incidental services to forestry and logging*
- etc.

Even with such a solution, which would provide a very unbalanced tree-structure (see 011 above), all the requested or needed elementary classes would not be always possible (even it seems possible for the beginning of the classification).

**2 - Use of letters for top categories, assuming 22 items at top level**

2a - Whether we remove the numeric digit constraint and replace the first two digits by letters (considering 22 < 26 letters) we can remain at a 4-digit maximum, while keeping the same level of detail. In such a case we get, for instance:

**A Agriculture, hunting, fishing, forestry**

- 01 Agriculture and related services (incl. Fish farming)
  - 011 *Crop production; market gardening; horticulture*
    - 0111 *Growing of cereals and other crops n.e.c.*
    - 0112 *Growing of vegetables, horticultural specialties and nursery products*
    - 0113 *Growing of fruit, nuts, beverage and spice crops*
  - 012 *Animal production*
    - 0121 *Farming of cattle, sheep, goats, horses, asses, mules and hinnies; dairy farming*
    - 0122 *Other animal farming; production of animal products n.e.c.*
  - 013 *Mixed agriculture*
    - 0130 *Mixed agriculture*
  - 014 *Incidental services to agriculture*
    - 0140 *Incidental services to agriculture*

- 02 Fish farming
  - 020 *Fish farming*
    - 0201 Open sea fish farming
    - 0202 Other fish farming
- 03 Fishing
  - 031 *Deep sea fishing*
    - 0310 Deep sea fishing
  - 032 *Costal and lagoon fishing*
    - 0320 Costal and lagoon fishing
  - 033 *Lake and river fishing*
    - 0330 Lake and river fishing
- 04 Hunting and trapping
  - 040 *Hunting and trapping*
    - 0400 Hunting and trapping
- 05 Forestry and logging
  - 050 *Forestry and logging*
    - 0501 Forestry
    - 0502 Logging
    - 0503 Incidental services to forestry and logging

Note: Fishing (split at the second level) and Forestry and logging (split at the third level) show that it is possible to play on both levels together to increase or not the number of possible items.

## **B Mining and quarrying**

- 11 Mining and extracting coal, lignite and peat
  - 111 *Mining and extracting coal, lignite and peat*
    - 1111 Mining and extracting coal
    - 1112 Mining and extracting lignite
    - 1113 Mining and extracting peat
  - 112 *Incidental services to coal, lignite and peat extraction*
    - 1120 Incidental services to coal, lignite and peat extraction
- 12 Extracting crude petroleum and natural gas (incl. Incidental services)
  - 120 *Extracting crude petroleum and natural gas (incl. Incidental services)*
    - 1201 *Extracting crude petroleum and natural gas*
    - 1202 *Incidental services to crude petroleum and natural gas extraction*
- 13 Mining and quarrying metallic ores
  - 131 *Mining uranium and thorium*
    - 1310 Mining uranium and thorium
  - 132 *Mining other metallic ores*
    - 1321 Mining and quarrying ferrous ores
    - 1332 Mining and quarrying non-ferrous ores
- 14 Mining and Quarrying non-metallic ores
  - 141 *Mining and quarrying stones, sand and clays*

- 1411 Mining and quarrying stones, sand and clays
  - 142 *Other mining and quarrying*
  - 1421 Mining and quarrying chemical and fertilizer minerals
  - 1422 Production of salt
  - 1423 Other mining and quarrying n.e.c.
- etc.

We can verify that replacing two figures by a letter at the first level insures the use of only 4 digits and is enough to create the same detail as in ISIC Rev.3. Varying the splits of the second and third level also increases the number of possible items, if needed.

### **3 - Use of numbers for top level, assuming inclusion of an additional top level**

3a - A strong request for an “aggregated” level (as in the ISIC rev. 2) needs to be taken into account. The single constraint considering such an inclusion is the link between the previous first level (either two numeric digits or a letter) and the following ones. If the choice is using only numbers (only using 4 digits) :

#### **1 Agriculture, hunting, fishing, forestry**

##### **10 Agriculture, hunting, fishing, forestry**

- 101 Agriculture and related services
  - 1011 *Growing of cereals and other crops n.e.c.*
  - 1012 *Growing of vegetables, horticultural specialties and nursery products*
  - 1013 *Growing of fruit, nuts, beverage and spice crops*
  - 1014 *Farming of cattle, sheep, goats, horses, asses, mules and hinnies; dairy farming*
  - 1015 *Other animal farming; production of animal products n.e.c.*
  - 1016 *Mixed agriculture*
  - 1017 *Incidental services to agriculture*
- 102 Fish farming
  - 1021 *Open sea fish farming*
  - 1022 *Other fish farming*
- 103 Fishing
  - 1031 *Deep sea fishing*
  - 1032 *Costal and lagoon fishing*
  - 1033 *Lake and river fishing*
- 104 Hunting and trapping
  - 1040 *Hunting and trapping*
- 105 Forestry and logging
  - 1051 *Forestry*
  - 1052 *Logging*
  - 1053 *Incidental services to forestry and logging*

#### **2 Mining and quarrying**

##### **20 Mining and quarrying**

- 201 Mining and extracting coal, lignite and peat
  - 2011 *Mining and extracting coal*
  - 2012 *Mining and extracting lignite*

- 2013 *Mining and extracting peat*
- 2014 *Incidental services to coal, lignite and peat extraction*
  
- 202 *Extracting crude petroleum and natural gas (incl. Incidental services)*
  - 2021 *Extracting crude petroleum and natural gas*
  - 2022 *Incidental services to crude petroleum and natural gas extraction*
  
- 203 *Mining and quarrying metallic ores*
  - 2031 *Mining uranium and thorium*
  - 2032 *Mining and quarrying ferrous ores*
  - 2033 *Mining and quarrying non-ferrous ores*
  
- 204 *Mining and Quarrying non-metallic ores*
  - 2041 *Mining and quarrying stones, sand and clays*
  - 2042 *Mining and quarrying chemical and fertilizer minerals*
  - 2043 *Production of salt*
  - 2044 *Other mining and quarrying n.e.c.*

With only 4 digits the items existing in the ISIC rev. 3 are possible but a part of the full structure is lost.

#### **4 - Use of letters for top levels, assuming inclusion of an additional top level**

The same “top-top” level is also possible using letters at the second level (option A) or at the second and third level (option B) with the same details and no more than four digits with the full structure as presented in the version 2a.

Option A implies a strict link between the first and the third level (0 to 01,02,03,04, 05; 1 to 11,12,13,14).

Option B implies a link between the first two levels. In such a case we come back to the present situation of NACE Rev. 1 the EU classification, which also includes sub-sections codified with 2 letters.

#### **Option A**

##### **A Agriculture, hunting, fishing, forestry**

- 01 *Agriculture and related services*
  - 011 *Crop production; market gardening; horticulture*
    - 0111 *Growing of cereals and other crops n.e.c.*
    - 0112 *Growing of vegetables, horticultural specialties and nursery products*
    - 0113 *Growing of fruit, nuts, beverage and spice crops*
  - 012 *Animal production*
    - 0121 *Farming of cattle, sheep, goats, horses, asses, mules and hinnies; dairy farming*
    - 0122 *Other animal farming; production of animal products n.e.c.*
  - 013 *Mixed agriculture*
    - 0130 *Mixed agriculture*
  - 014 *Incidental services to agriculture*
    - 0140 *Incidental services to agriculture*
  
- 02 *Fish farming*
  - 020 *Fish farming*
    - 0201 *Open sea fish farming*
    - 0202 *Other fish farming*
  
- 03 *Fishing*



- 031 *Deep sea fishing*
  - 0310 Deep sea fishing
- 032 *Costal and lagoon fishing*
  - 0320 Costal and lagoon fishing
- 033 *Lake and river fishing*
  - 0330 Lake and river fishing
- 04 Hunting and trapping
  - 040 *Hunting and trapping*
    - 0400 Hunting and trapping
- 05 Forestry and logging
  - 050 *Forestry and logging*
    - 0501 Forestry
    - 0502 Logging
    - 0503 Incidental services to forestry and logging

## **B Mining and quarrying**

- 11 Mining and extracting coal, lignite and peat
  - 111 *Mining and extracting coal, lignite and peat*
    - 1111 Mining and extracting coal
    - 1112 Mining and extracting lignite
    - 1113 Mining and extracting peat
  - 112 *Incidental services to coal, lignite and peat extraction*
    - 1120 Incidental services to coal, lignite and peat extraction
- 12 Extracting crude petroleum and natural gas (incl. Incidental services)
  - 120 *Extracting crude petroleum and natural gas (incl. Incidental services)*
    - 1201 *Extracting crude petroleum and natural gas*
    - 1202 *Incidental services to crude petroleum and natural gas extraction*
- 13 Mining and quarrying metallic ores
  - 131 *Mining uranium and thorium*
    - 1310 Mining uranium and thorium
  - 132 *Mining other metallic ores*
    - 1321 Mining and quarrying ferrous ores
    - 1332 Mining and quarrying non-ferrous ores
- 14 Mining and Quarrying non-metallic ores
  - 141 *Mining and quarrying stones, sand and clays*
    - 1411 Mining and quarrying stones, sand and clays
  - 142 *Other mining and quarrying*
    - 1421 Mining and quarrying chemical and fertilizer minerals
    - 1422 Production of salt
    - 1423 Other mining and quarrying n.e.c.

etc.

We can verify as in the codifying version 2a that more detail than in ISIC rev. 3 is possible and the full structure is kept.

## Option B

### **A Agriculture, hunting, fishing, forestry**

#### AA Agriculture and related services

##### 01 *Crop production; market gardening; horticulture*

011 Growing of cereals and other crops n.e.c.

012 Growing of vegetables, horticultural specialties and nursery products

013 Growing of fruit, nuts, beverage and spice crops

##### 02 *Animal production*

021 Farming of cattle, sheep, goats, horses, asses, mules and hinnies; dairy farming

022 Other animal farming; production of animal products n.e.c.

##### 03 *Mixed agriculture*

030 Mixed agriculture

##### 04 *Incidental services to agriculture*

040 Incidental services to agriculture

#### AB Fish farming

##### 05 *Fish farming*

051 Open sea fish farming

052 Other fish farming

#### AC Fishing

##### 06 *Deep sea fishing*

061 Deep sea fishing

##### 07 *Costal and lagoon fishing*

071 Costal and lagoon fishing

##### 08 *Lake and river fishing*

081 Lake and river fishing

#### AD Hunting and trapping

##### 09 *Hunting and trapping*

090 Hunting and trapping

#### AE Forestry and logging

##### 10 *Forestry and logging*

101 Forestry

102 Logging

103 Incidental services to forestry and logging

### **B Mining and quarrying**

#### BA Mining and extracting coal, lignite and peat

##### 11 *Mining and extracting coal, lignite and peat*

111 Mining and extracting coal

- 112 Mining and extracting lignite
  - 113 Mining and extracting peat
  
  - 12 *Incidental services to coal, lignite and peat extraction*
    - 120 Incidental services to coal, lignite and peat extraction
  
  - BB Extracting crude petroleum and natural gas (incl. Incidental services)
    - 13 *Extracting crude petroleum and natural gas (incl. Incidental services)*
      - 131 *Extracting crude petroleum and natural gas*
      - 132 *Incidental services to crude petroleum and natural gas extraction*
  
  - BC Mining and quarrying metallic ores
    - 14 *Mining uranium and thorium*
      - 140 Mining uranium and thorium
  
    - 15 *Mining other metallic ores*
      - 151 Mining and quarrying ferrous ores
      - 152 Mining and quarrying non-ferrous ores
  
  - BD Mining and Quarrying non-metallic ores
    - 16 *Mining and quarrying stones, sand and clays*
      - 160 Mining and quarrying stones, sand and clays
  
    - 17 *Other mining and quarrying*
      - 171 Mining and quarrying chemical and fertilizer minerals
      - 172 Production of salt
      - 173 Other mining and quarrying n.e.c.
- etc.

The important remark concerning such a method (1 letter then 2 letters then 2 figures then 3 figures) provides the same details as in ISIC Rev. 3 with only 3 digits (that means a possible further level, so more detail if needed than in ISIC Rev. 3).

The main problem concerning a requested top-top level is that near everybody agree the needs but nobody agree on the list of the items which could compose such a level (see discussion in ISIC structure paper).

## **5 - Additional “intermediate” level for manufacturing activities**

Which structure should be used in Manufacturing? Should the single “Manufacturing” category be split immediately into 16 subcategories (option A)? Or with an intermediate level (4 or 5 groupings) then to further details (option B)?

The options influence the codifying systems that could be chosen.

Remark: this question can be mixed with the previous one providing more complex solutions not seen here.

The draft structure shown in the ISIC structure paper reflects option A.

### **Option A**

#### **Manufacturing**

Manufacture of food products, beverages and tobacco products  
 Manufacture of textiles, wearing apparel, fur, leather and related products  
 Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials  
 Manufacture of paper and paper products  
 Printing and reproduction of recorded media  
 Manufacture of coke, refined petroleum products and nuclear fuel  
 Manufacture of chemicals and chemical products  
 Manufacture of rubber and plastics products  
 Manufacture of other non-metallic mineral products  
 Manufacture of basic metals  
 Manufacture of fabricated metal products, except machinery and equipment  
 Manufacture of machinery and equipment n.e.c.  
 Manufacture of computers, communications equipment, electronic components  
 Manufacture of electrical equipment  
 Manufacture of transport equipment  
 Manufacture of furniture; manufacturing n.e.c.

**Option B** (as well the intermediate groupings at the second breakdown are just examples to illustrate the consequences on the structure and on the codes. Here the choice of the intermediate groupings is based on the “processes”.)

#### **Manufacturing**

Manufacture of food products, beverages and tobacco products  
     *Manufacture of food products (incl. Preparation of crops)*  
     *Manufacture of beverages*  
     *Manufacture of tobacco products*  
 Manufacture of textiles, wearing apparel, fur, leather and related products  
     *Manufacture of textile*  
     *Manufacture of wearing apparels and fur*  
     *Manufacture of leather and related products (excl. Wearing apparels)*  
 Manufacture of wood and wood products  
     *Manufacture of wood and wood products*  
     *Manufacture of pulp, paper and paperboard*  
     *Printing, reproduction of media*  
 Manufacture of petroleum products, chemicals, chemical products, plastics and rubber  
     *Refining of petroleum; manufacture of coke and nuclear fuels*  
     *Manufacture of chemicals and chemical products*  
     *Manufacture of plastic and rubber products*  
 Manufacture of metals, machines, transport and electric/electronic equipments  
     *Manufacture of basic metals*  
     *Manufacture of metal products*  
     *Manufacture of machinery and equipment n.e.c.*  
     *Manufacture of electrical appliances and components*  
     *Manufacture of electronic components, computers and communication equipments (ICT goods)*  
     *Manufacture of transport equipment*  
 Manufacturing n.e.c.  
     *Manufacture of other non-metallic mineral products*  
     *Manufacture of furniture and related products*  
     *Manufacture of domestic appliances n.e.c.*  
     *Manufacture of optical instruments, photographic equipment, watches and clocks*  
     *Miscellaneous manufacture n.e.c.*

An intermediate level, is firstly more structuring and secondly allows more items at the equivalent level of Divisions (presently 22 in ISIC rev. 3; only 16 in the option A; 23 in the option B, even more if needed). But the main consequences concern the “codes”: all the codifying systems are not possible with option A.

The consequences of the previous “structuring” problem concern the codifying system: which one could

be applied considering the shape of the tree-structure in Manufacturing?

**1<sup>st</sup> hypothesis: the choice of a numeric codifying system limited at 4 digits**

Option A: real problems

Manufacturing at the level “22 items” is coded with two figures, so the 16 items splitting the Manufacturing need three digits (and this level is only the current Division level). The following breakdowns need two more digits, which results in a codifying system with 5 numeric digits to obtain the same details that in the ISIC rev. 3.

Option B: some problems

Manufacturing is pulled to the top level. The intermediate level is put on the level “22 items”. The Manufacturing item needs 1 digit, the intermediate breakdowns need 2 digits and the equivalent Division level (last presented level) only 3 digits.

If we consider the present ISIC Rev. 3 structure, two more digits are necessary that also means a codifying system with 5 numeric digits to obtain the same details as in ISIC Rev. 3.

**2<sup>nd</sup> hypothesis: the choice of a alphanumeric codifying system limited at 4 digits (but offering 5 levels considering the use of letters).**

Option A: no problem

Manufacturing at the level “22 items” is coded with one or two letters, so the 16 items splitting Manufacturing need 2 digits. The same detail as in ISIC Rev. 3 needs two more digits: a codifying system with 4 figures is enough.

Option B: no problem

Manufacturing is pulled to the top level (one figure or one letter). The intermediate level is put on the no more than “26 items” level (respectively one or two letters). The equivalent Division level (last presented level) uses only 2 digits as presently the Division level (if, of course, the number of items remains under 100; what was verified before).

If we consider the present ISIC Rev. 3 structure, two more digits are necessary that means a codifying system with 4 digits to obtain the same details as in ISIC Rev. 3 (or more if needed).

It seems clear an intermediate level in the Manufacturing domain and an alphanumeric codifying system are options that should be taken into account.

However, the codifying system is not the only reason:

- remember the weight of Manufacturing in national economies is between 15% and 30%. Such an item among about 25 items whose the average weight would be 3% could seem “a little too much sized” while among 9 items (top level) it would not seem “too big”;
- remember also that two aggregated levels codified with letters is not an obstacle to only use figures for data input (only using the numeric keypad): it is highly unlikely to input data at the aggregated levels (no more than 25 items) that means only the other levels (numeric codes) are used. After this, the aggregation becomes a correspondence table problem while processing data.

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