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FINAL REPORT
REVIEW OF THE FUNCTIONING OF THE CPV CODES/SYSTEM

RAMBØLL

3ME Bundesverband
Materialwirtschaft
Einkauf und Logistik e. V.

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REVIEW OF THE FUNCTIONING OF THE CPV CODES/SYSTEM

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GLOSSARY OF ABBREVATIONS

BME	Bundesverband Materialwirtschaft, Einkauf und Logistik e.V.
CAx	Computer-aided technologies
CEN	European Committee for Standardisation
cMap	Classification Mapping for open and standardized product classification usage in eBusiness
CPA	Classification of Products by Activity
CPC	Central Product Classification
CPV	Common Procurement Vocabulary
CWA	CEN Workshop Agreement
DIN	Deutsches Institut für Normung (German Institute for Standardisation)
DG MARKT	Internal Market and Services Directorate General
GPC	Global Product Classification
EC	European Commission
EDP	Electronic Data Processing
EEA	European Economic Area
ePDC	Electronic Product Description and Classification
EU	European Union
InfoTerm	International Information Centre for Terminology
ISIC	International Standard Industrial Classification
n/a	not available
NACE	Nomenclature statistique des activités économiques dans la Communauté européenne (Statistical Classification of Economic Activities in the European Community)
SIMAP	Information System for European Public Procurement
SME	Small and Medium Enterprises
TED	Tenders Electronic Daily
TV	Television
UK	United Kingdom
UNSPSC	United Nations Standard Products and Services Code

0.   EXECUTIVE SUMMARY

0.1   Introduction

The "Common Procurement Vocabulary" (CPV) is a single classification system for public procurement. It consists of 9,454 codes structured in a five-level tree hierarchy. Each code is made up of 8-digits and a wording that describes the type of works, supplies or services forming the subject of the contract.

The purpose of the CPV is to make it easier for bidders to identify relevant tender notices. Bidders can find these by searching for CPV codes. Furthermore the CPV is available in all the European Union's 23 official languages (24 by July 2013). Thus, the CPV shall foster cross-border procurement in particular since it allows bidders to identify tender notices more easily in different languages.

The intervention logic behind the CPV aims to increase competition and ensure a higher level of transparency. If relevant publications can be identified more easily and also across borders, this will result in more bids and increase competition between bidders. This contribution to the Single European Market should eventually lead to better value for money in public procurement.

The CPV is based on the Classification of Products by Activity (CPA) nomenclature. The first version of the CPV was published in 1993. It has been revised extensively three times since then.

Originally, the CPV was provided for through Commission Recommendations and use of the CPV was therefore only a recommendation to contracting entities/authorities when publishing contract notices. Since 2002 the CPV has been embedded in a regulation and since 2006 the application of the CPV has been mandatory when publishing tender notices on TED (Tenders Electronic Daily).

The European Commission, DG Internal Market and Services assigned a review of the CPV to Ramboll Management Consulting and Bundesverband Materialwirtschaft, Einkauf und Logistik e.V. (BME). The review evaluated the functioning of the current CPV and examined scenarios for future improvements. This report presents the findings of the review.

The review builds on a variety of methods, among others:
- An analysis of the TED notices database of all tender notices from 2009 to 2011 (some 496,000 notices);
- Some 25 interviews with practitioners from contracting authorities and further subject experts (Publications Office, eSenders, cMap project representatives etc.);
- An online survey of CPV users (contracting authorities and bidders) with more than 12,000 respondents;
- An analysis of a sample of 405 tender notices from TED;
- A comparison of the CPV with three other classification systems: eCl@ss, UNSPSC and GPC;
- A literature review.

0.2   Functioning of the current CPV

General functioning of the CPV

The experts interviewed and the CPV users surveyed (contracting authorities and bidders) confirmed that providing a uniform classification system for public procurement is helpful in publishing and identifying tender notices.

Of the contracting authorities surveyed, 70% thought that the codes allow more bidders to become aware of their notices and 56% stated that the CPV leads to better value for money. Of the bidders surveyed, 57% stated that the CPV allows them to become aware of more tender notices, and 45% perceived that the CPV leads to more business opportunities.

Both contracting authorities and bidders assessed the costs of applying the CPV as very low.

This indicates that the current CPV is an efficient and effective instrument. However, there are possibilities for improving the current CPV.

The main findings of this study are presented in the following paragraphs:

CPV vs. the alternative of searching by keywords

Analysis of search patterns showed that bidders use keyword search more often than searching by CPV codes. More than 70% use keywords in at least every second search, but fewer than 40% of the bidders use the CPV regularly. The main reasons given for this are that bidders are not familiar enough with the CPV and that the CPV is difficult to use. Furthermore, the perception of bidders using text search is that it returns better search results – both for identifying all relevant notices and avoiding non-relevant notices. Thus, usage of the CPV would increase and be improved if users acquired greater familiarity with the CPV and it were more user-friendly.

Extent of (in)correct use of the CPV

The bidders surveyed explained that tender notices with incorrect codes are a major barrier to effective CPV searches and a reason for searching by keywords instead.

Indeed, a relatively high proportion of tender notices contain inaccurate codes. A test with a sample of 405 tender notices showed that the code was inaccurate in about 23% of the notices. In around 10% of cases the code applied did not describe the work/supply/service procured; in some 8%, the code applied was too general, and in about 4%, the code was too specific.

The extent of incorrect use is highest for works, where around 28% of the works notices tested carried an incorrect code. The review concludes from the evidence collected that the main reason for this is the structure of the CPV for works. It does not match distinctions otherwise used in the construction industry. Furthermore several codes for works are not mutually exclusive, but overlap. Examples for this are the codes "45223220 Structural shell work" and "45215100 Construction work for buildings relating to health". Thus, a review of CPV construction codes could significantly reduce incorrect use of codes.

Structure of the CPV

The hierarchical tree structure of the CPV is not always consistent. Some code classification levels are not conclusive (some codes should be on higher or lower levels), some codes do not match the subject of the superordinate level (they should be grouped under different superordinate codes) and some codes are not mutually exclusive (cf. above). Moreover, in comparison with other classification systems, the CPV is less balanced. The different divisions, groups and classes each contain a very different number of single elements. Thus, greater consistency of approach would make the CPV easier to navigate.

Level of detail of the CPV

The current CPV makes it possible to describe works/supplies/services in considerable detail. However, it turned out that the level of detail provided is not fully used in practice and also not necessary. Bidders usually search at a more general level than the level of codes provided by contracting authorities. Reducing the level of detail of the CPV (i.e. the number of codes) would make it easier to apply.

In addition to the main vocabulary, the CPV also has a supplementary vocabulary. With the supplementary vocabulary, it is possible to describe works/supplies/services in greater depth. There are, for example, codes for different materials, e.g. "Metal", "Aluminium", "Bronze" etc. These can be used in connection with CPV codes to describe the attributes of particular works/supplies/services. The supplementary vocabulary consists of 903 codes, which are sub-divided into 19 sections and 43 groups.

An analysis of all tender notices from 2009 to 2011 showed that the supplementary vocabulary was used in only 1.5% of the notices. It therefore does not seem necessary to use it to arrive at an accurate description of works/supplies/services in tender notices. Thus, deletion of the supplementary vocabulary would not be detrimental.

Coverage of the CPV

The coverage of the CPV is generally complete. With very few exceptions, all contract subjects can be described with CPV codes. The review draws this conclusion from the view of the users

surveyed and from a comparison of the CPV with other classification systems. There are no broad types of works/supplies/services which are missing in the CPV.

<u>CPV and cross-border procurement</u>

As pointed out, one of the purposes of the CPV is to facilitate cross-border procurement. The CPV removes the need to perform text searches in different languages. Instead, a single search for specific CPV codes will return tender notices from all Member States. The survey showed that the CPV is used in equal measure to identify cross-border procurement opportunities and domestic opportunities.

<u>CPV and below-threshold procurement</u>

The CPV is mandatory only for above-threshold procurement. But it is also used below EU thresholds. Of the contracting authorities surveyed, 36% stated that they always use the CPV below EU thresholds as well. There are several reasons for this. In some Member States, it is mandatory to apply EU procurement rules, including the use of the CPV, below thresholds. In addition, several buyers surveyed mentioned that the IT system they use for the publication of notices requires the application of CPV codes. Finally, some bidders stated that applying CPV codes is regarded as a standard procedure in their organisation in order to attract as many bidders as possible.

The usage of the CPV below thresholds was also analysed quantitatively on the basis of data from Finland, Sweden and the UK. It transpired that the patterns of usage are very similar above and below the thresholds. The same codes are used more and less frequently. The level of detail applied is also very similar. This shows that the current CPV is suitable both for above and below threshold procurement.

0.3   Scenarios for improving the CPV

<u>(Online-)Tools for supporting the functioning of the CPV</u>

The survey showed that contracting authorities mostly use SIMAP/TED to identify relevant CPV codes for their notices or searches respectively. However, comparing the search functionality of SIMAP/TED with the search functionalities of other classification systems and with tools for searching for CPV codes offered by third parties shows that the tools provided by SIMAP/TED could be considerably more user-friendly. Other systems offer additional functionalities, i.e. easier navigation, offering suggestions while typing and a more comprehensive presentation of the structure of the CPV and single codes. The search functionality currently provided by SIMAP/TED is complicated to use and not very user-friendly. Providing a better online search functionality for CPV codes for both contracting authorities and bidders would help users apply the CPV better. The costs for this are estimated to be relatively low while the benefits are very high.

Furthermore, offering additional interactive tools, such as a wiki, web-seminars, feedback mechanisms or online-forums could also be useful. However, such tools would be more costly to implement as it would be necessary to provide them in all official languages. It would also be necessary to administer them on an ongoing basis. Concentrating efforts on better search tools is likely to be more cost-effective.

<u>Integration of the CPV in an e-procurement environment</u>

The CPV is currently used only for the publication and identification of tender notices. The European Commission advocates extended use of e-procurement in the field of public procurement. E-procurement means not only e-tendering, but covers as well the whole procurement process from planning to invoicing. To this end, we investigated how the CPV could be integrated in e-procurement environments.

The CPV could be especially useful for procurement planning and controlling, and for electronic catalogues (e-catalogues). However, to be integrated in e-procurement environments, the CPV would need to meet certain requirements.
- It should integrate and relate to existing international standards for classification systems in structure, data model and content.

- It should provide attributes and keywords/synonyms. Attributes are currently already provided to a limited extent through the supplementary vocabulary. The CPV does not yet provide keywords/synonyms.

There are several possibilities (scenarios) for enhancing the CPV so as to meet the requirements outlined above.

1. Enhance the current CPV: this would mean revising the supplementary vocabulary thoroughly (in contrast to the conclusion presented above to delete the supplementary vocabulary). Furthermore, a data model for keywords and synonyms would have to be developed. After that, keywords and synonyms would have to be defined for 9,454 elements of the CPV. This might be feasible but implies considerable effort.

2. Collaborate with another classification system: other existing product classification systems already fulfil the requirements set out above, so the CPV could use the data model for keywords from a classification system which also provides a table with all keywords. For this, it would be necessary to map all the elements of this classification system with keywords for the corresponding CPV element. The work of the cMap project would be a basis for this. This scenario might be feasible. However, the mapping and the continuous update of the mapping in the event of changes would require considerable resources.

3. Allow different product classification systems to coexist: the CPV would not be integrated in e-procurement environments but would continue only as a classification system for publishing and identifying tender notices. In this scenario, the CPV would merely be optimised as outlined in the sectioning on the current functioning (generally fewer details, better structure in some areas (e.g. for works), etc.) In e-procurement, including e-catalogues, there would be freedom of choice as to which classification system to apply, i.e. the CPV, another recognised classification system, or an application's own system. In this scenario, the CPV could be simplified as it would need to meet only the criteria relevant for publishing and identifying tender notices.

Maintenance of the CPV

Currently, there is no defined process for maintaining the CPV (i.e. process for updating the CPV). Other classification systems have defined maintenance processes which, for example, set certain release dates and involve users. As the CPV is provided through a regulation, it follows the usual procedures for amending regulations.

A maintenance process for the CPV would need to include the following elements: shorter release cycles should than in the past. It would be useful to distinguish between major and minor releases. Major releases occur less frequently but can consist of fundamental changes, e.g. to the structure of the CPV. Minor releases could occur more frequently (e.g. yearly) but only add single codes due to market demands or to correct clerical errors. As the survey showed, the users of the CPV are also motivated to be involved in updates of the CPV. Thus, users should be given the possibility of submitting suggestions for changes and an expert group could decide regularly on these changes.

Finally, it might be necessary to think about whether a reflection on the legislative nature of the CPV should be initiated in order to allow more flexibility.

0.4   Recommendations

Our main recommendations are summarised below:

Recommendations in regard to the current CPV:

1. The CPV as a multilingual classification system for public procurement should be preserved. It should, however, be improved.

2. The level of detail of the CPV (i.e. the number of codes) should be reduced. The Supplementary Vocabulary should be completely dropped.

3. All elements of the CPV should be reviewed. Codes used only seldom should be dropped and the problems identified in regard to the structure of the CPV solved as far as possible (cf. section 2.2.2).

4. For works, the structure of the CPV should be thoroughly reviewed and completely revised if necessary. It should better match distinctions used otherwise in the industry in order to reduce the high level of works tender notices with inaccurate codes.

5. Better guidance and better search tools should be provided (cf. section 3.1 below).

Recommendations for the future CPV:

1. The user-friendliness of the functions offered by TED/SIMAP should be improved and interactive instruments, such as web seminars, a wiki and feedback functionalities should be offered.

2. There are several possibilities for integrating the CPV in an e-procurement environment. The current CPV could be enhanced, one could collaborate with another classification system or different product classification systems could coexist. Each possibility has advantages and disadvantages (cf. section 3.2.6) and a decision amongst these could be taken.

3. A release policy for the CPV should be defined and should distinguish between major and minor updates. Users should be involved in the maintenance of the CPV in a structured way. Furthermore, a reflection on the legislative nature of the CPV should be initiated to allow more flexibility.

1. INTRODUCTION

1.1 Background

Objectives of the CPV

The CPV is a single classification system for public procurement which aims at standardising the references used by contracting authorities and entities to describe the subject of procurement contracts.

The European Commission drafted the first Common Procurement Vocabulary (CPV) in 1993 to make public procurement more transparent and efficient[1]. The first CPV Regulation was adopted in December 2002. Regulation No 2151/2003[2] established CPV as "a single classification system applicable to public procurement" as of 16 December 2003[3]. The use of the CPV for above EU-thresholds[4] procurement has been mandatory in the European Union since February 2006[5].

The objectives of the CPV are:

- To enhance transparency, efficiency and competition in EU public procurement markets by providing a common basis for formulating procurement needs by contracting authorities and by making it easier to identify procurement opportunities for suppliers;
- To define the procurement opportunities in public procurement notices (CPV codes are used by contracting authorities when publishing procurement notices through Tenders Electronic Daily to define the object of a contract);
- To foster the cross-border element of procurement since the CPV allows an automated translation of the procurement opportunities of the contract into all EU official languages[6].

In addition, the CPV simplifies the drafting of statistics on public procurement, since it is compatible with trade monitors used throughout the world (especially those used by the United Nations).

The CPV consists of a main vocabulary and a supplementary vocabulary. The main vocabulary defines the subject of a contract whereas the supplementary vocabulary may be used to add further qualitative information on the subject of the contract. The main vocabulary is based on a tree structure comprising codes of up to 9 digits (an 8 digit code plus a check digit) associated with a wording that describes the type of works, supplies or services forming the subject of the contract. In total, there are today 9,454 codes. In the supplementary vocabulary, the items are made up of an alphanumeric code with a corresponding wording allowing further details to be added regarding the specific nature or destination of the works/supplies/services to be purchased.[7] In total, there are today 903 supplementary vocabulary items.

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[1] Guide to the Common Procurement Vocabulary (CPV), European Commission, http://www.simap.europa.eu/codes-and-nomenclatures/codes-cpv/cpv_2008_guide_en.pdf

[2] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32003R2151:EN:HTML

[3] Regulation EC 2195/2002, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:340:0001:0001:EN:PDF

[4] See section 2.1.5 for an explanation of the EU-thresholds.

[5] http://simap.europa.eu/codes-and-nomenclatures/codes-cpv/codes-cpv_en.htm

[6] Cf. Guide to the Common Procurement Vocabulary (CPV), European Commission, http://www.simap.europa.eu/codes-and-nomenclatures/codes-cpv/cpv_2008_guide_en.pdf

[7] http://simap.europa.eu/codes-and-nomenclatures/codes-cpv/codes-cpv_en.htm

History of the CPV

The CPV is based on the nomenclature Classification of Products by Activity (CPA). The CPA in turn was built on the basis of two classifications, the Central Product Classification (CPC) which is an international nomenclature developed by the United Nations to monitor world trade and the International Standard Industrial Classification (ISIC) which is a nomenclature promoted by the United Nations to classify economic activity. The CPA was developed as a six-digit code system to provide a product classification for Europe which is better suited to European needs. The final version of the CPA was produced in August 1992.[8]

However, it was obvious that the CPA was not detailed enough for public procurement purposes as it was not able to provide adequate descriptions of the works/supplies/services that organisations were procuring. The CPA was chosen as the basis for the CPV mainly because it was consistent at European level and well suited to the industrial structure of the European Community.

In the first version of the CPV published in 1993, the numerical part of the codes was extended from six to eight digits and an additional list of supplementary codes was included. The second version of the CPV was issued in June 1994. One of the most substantial changes in the second version was the addition of a check digit separated from the first eight digits, in order to avoid typing errors.

Since then, the CPV has undergone several further revisions. During these, new codes and divisions were introduced and existing ones deleted or transferred, among others.

Initially, the CPV was provided through Commission Recommendations[9] and the use of the CPV was only *recommended* to contracting entities/authorities when publishing contract notices. The first CPV Regulation (2195/2002) was adopted in December 2002. Use of these codes was made *mandatory* as from 1 February 2006[10] although in practice it took some time for all contracting authorities to comply with this obligation.[11]

Between 2004 and 2007, the CPV was revised in order to change the old materials-driven structure to a product-type-driven structure.[12] Additionally the divisions of the CPV were changed in order to rationalise its hierarchy[13].

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[8] Cf. Guide to the Common Procurement Vocabulary (CPV), European Commission, http://www.simap.europa.eu/codes-and-nomenclatures/codes-cpv/cpv_2008_guide_en.pdf

[9] E.g. Commission Recommendation 96/527/EC of 30 July 1996 on the use of the CPV, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996H0527:EN:HTML

[10] Commission Regulation (EC) No 1564/2005 establishing standard forms for the publication of notices in the framework of public procurement procedures, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:313:0003:0035:EN:PDF

[11] Commission Staff Working Paper: "Evaluation Report Impact and Effectiveness of EU Public Procurement Legislation, Part 1" SEC(2011) 853 final: Brussels, 27.6.2011, http://ec.europa.eu/internal_market/publicprocurement/modernising_rules/evaluation/index_en.htm

[12] Guide to the Common Procurement Vocabulary (CPV), European Commission; Commission Regulation 213/2008, http://www.simap.europa.eu/codes-and-nomenclatures/codes-cpv/cpv_2008_guide_en.pdf

[13] The CPV codes are based on a hierarchy of divisions, groups, classes, categories and sub-categories.

1.2 Intervention logic

The overall logic model for the CPV is shown in the following figure.

Figure 1: The CPV intervention logic

Commission Regulation EC 213/2008: Provides uniform classification system for goods / services / works (CPV)

⬇

Used for publication of tender notices in TED

⬇

Easier identification of relevant publications for bidders (also cross-border bidders)

⬇

More bids (including cross-border bids)

⬇

More competition

⬇

Better value for money
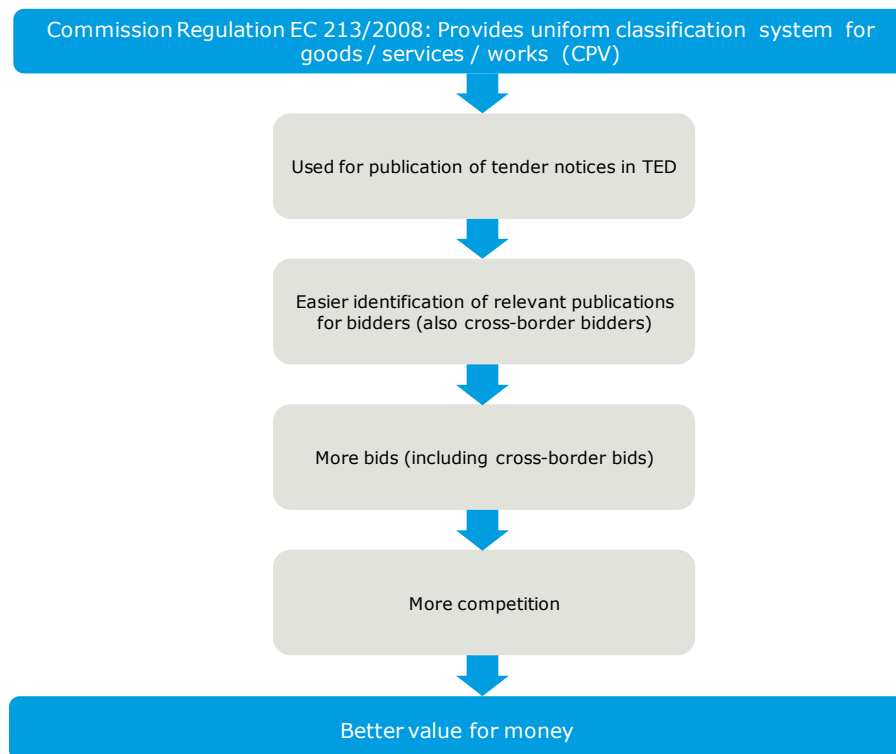
The theory behind the CPV is that it fosters competition and ensures a higher level of transparency by providing a uniform classification system for works, supplies and services. If relevant publications can be identified more easily and also across borders, this will result in more bids and increase competition between bidders. A vital assumption is here that the level of detail used enables a high number of bidders to identify tender notices as relevant for them. At the same time the CPV's structure needs to be simple enough for there to be a strong motivation for suppliers to use codes when searching for contract notices relevant for them. This contribution to the Single European Market ultimately benefits the procuring authority because it achieves better value for money when acquiring works, supplies and services.

1.3 Evaluation questions and approach

Within the next few years, the Commission wishes to revise the CPV and this requires an informed decision about which modifications should be undertaken. For this purpose, an evaluation of the current state of the CPV and its functioning is vital.

The analysis conducted was therefore guided by two perspectives:
- From an **ex-post** perspective: an investigation of how the current CPV is functioning overall;
- From an **ex-ante** perspective: an examination of how the CPV system, its functioning and its content could be improved in the future.

The ex-post perspective contains three sub-questions:
- To what extent does the CPV meet its objectives?
- To what extent are these objectives relevant?
- To what extent does the CPV reach its objectives in an effective and efficient manner?

The ex-ante perspective contains six sub-questions:
- Which codes should be deleted, modified or added?
- How should the structure of the CPV be modified?
- How can the CPV integrate into an e-procurement environment?
- How to up-date the CPV in regard to market developments?
- What tools could support the functioning of the CPV?
- What additional scenarios could improve the CPV system?

All these questions are subdivided into particular questions. A detailed list of the questions and the corresponding particular questions, which have been integrated into an overall evaluation matrix, can be found in Appendix 4 of this document.

In order to answer these questions, a three-tier approach was developed:
- In the first task, the usefulness of the codes and appropriateness of the current subdivision/classification levels, the accuracy of the codes and effectiveness in applying/using codes, as well as the coverage and completeness of codes were examined. This was carried out through analysis of documents and data, and through expert interviews.
- In the second task, feedback and concerns from users (contracting authorities and suppliers) were gathered. This was done via an online survey and further expert interviews.
- The third task was to analyse CPV future scenarios and make recommendations on the basis of the information gathered in the previous two tasks.

1.4   Overview of this report

This report presents the results of the review of the CPV. The report is structured by evaluation questions and incorporates findings derived by applying different methodologies.

Chapter 2 presents the ex-post evaluation of the functioning of the current CPV. The chapter first deals with the usefulness of the current CPV and then discusses explanatory factors for the observations on the way in which the CPV is functioning. It concludes with recommendations in regard to the current CPV.

Chapter 3 presents scenarios for improving the CPV from an ex-ante perspective. This entails recommendations for better online-tools, the integration of the CPV in an e-procurement environment and recommendations for the maintenance process.

The results presented in this report build on a variety of methods. Details of the methodologies applied can be found in Chapter 4.

2. FUNCTIONING OF THE CURRENT CPV

This chapter presents the ex-post evaluation of the functioning of the current CPV. The chapter first deals with the usefulness of the current CPV for buyers, bidders, cross-border procurement and below-threshold procurement (section 2.1). This section concludes with an assessment of the costs and benefits/impacts of the CPV. The chapter then discusses explanatory factors for the observations on the way in which the CPV is functioning (section 2.2). A summary of our recommendations is provided at the end of the chapter in section 2.3.

2.1 Usefulness of the current CPV

This section presents an overall assessment of the usefulness of the current CPV for publishing and identifying tender notices. It first provides a general view of the usefulness of the CPV. Afterwards more specific insights from both contracting authorities (buy side) and bidders (sell side) are discussed. Then the section looks at the use of the CPV for cross-border and below threshold procurement. Finally the costs, benefits and impacts of the CPV are assessed.

The analysis builds on different methodologies: These are mainly the quantitative analysis of CPV usage (cf. section 4.1), the review of the Commission's own findings (cf. section 4.2), the discussion of codes with practitioners (cf. section 4.5), the analysis of a sample of tender notices (cf. section 4.6), the comparison of the CPV with other classification systems (cf. section 4.7), and the online survey of CPV users (cf. section 4.8).

2.1.1 General usefulness

In the course of the online survey respondents were asked to assess the general usefulness of the CPV. The survey differentiated between respondents according to their role in the procurement process.

Figure 2: Buyers - General usefulness of the CPV

How do you assess the general usefulness of the CPV for describing your procurement needs?

| 13% | 42% | 34% | 12% |

N = 3358   ■ Very useful ■ Somewhat useful ■ Limited usefulness ■ Not useful at all
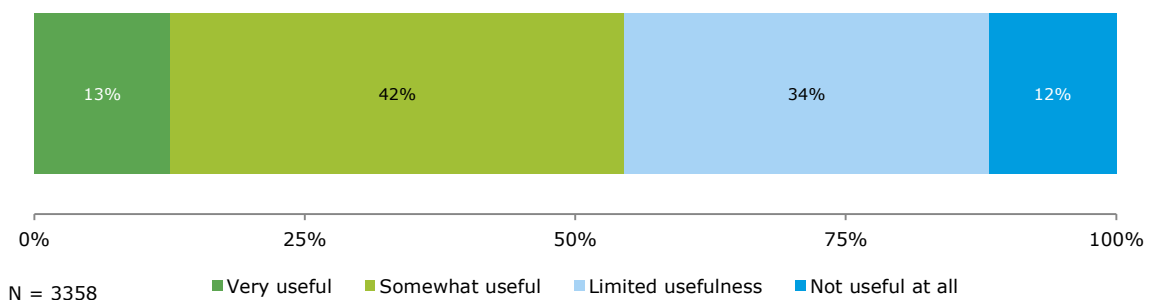
Figure 3: Bidders - General usefulness of the CPV

How do you assess the general usefulness of the CPV for identifying tender notices which are relevant to you?

| 23% | 46% | 22% | 9% |

0%   25%   50%   75%   100%

N = 3687   ■ Very useful   ■ Somewhat useful   ■ Limited usefulness   ■ Not useful at all
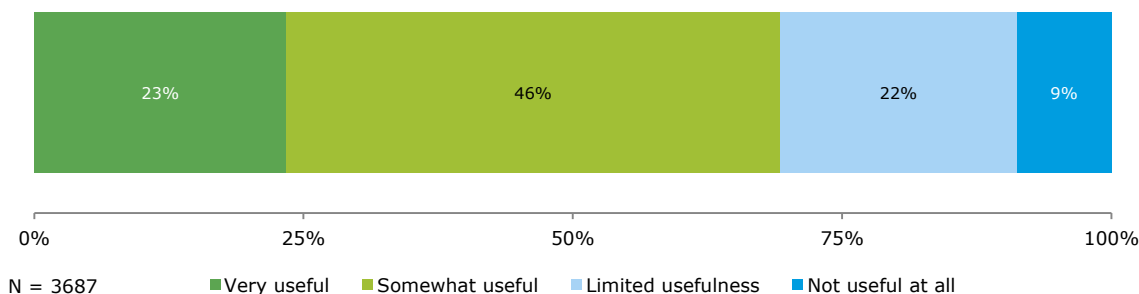
As Figure 2 and Figure 3 show, more than 50% of both buyers and bidders regard the use of the CPV as beneficial. Only 12% of the buyers and 9% of the responding bidders see no benefit at all. This means the users regard the CPV as useful in principle.

The results of this survey are representative at EU level as respondents were spread representatively among all EU Member States. Additionally, the high number of respondents (4,228 buyers and 4,537 bidders) guarantees relevance and validity of the results.

Comparing the responses of both groups, bidders assess the usefulness of the CPV for their work as greater than buyers do. Almost 70% of all bidders regard the CPV as very or somewhat useful compared to 55% of all buyers.

When asked for the reasons for their general assessment in an open text question, many buyers responded that they see the CPV as being of much more use to the bidders – which is reflected in the overall result.

The main criticism from the buyers is the handling/usability of the system, which in the view of some buyers is too complicated and not transparent enough. As explanation for their assessment they state for example that they find it difficult to find appropriate codes since there tend to be misleading descriptions or different codes seem to be duplicates. We will come back to these statements in section 2.2.

Moreover, the number and range of CPV codes was criticised because of the lack of specific codes or because problems arise from some categories being too detailed (see also sections 2.2.2 and 2.2.3 below). The main advantage that buyers see in the CPV is the possibility of avoiding ambiguity and guaranteeing a clear and efficient search process. Some respondents also experienced an internationalisation of their business and a gain in transparency through the use of the CPV.

Bidders are more positive in their assessment, emphasising the possibilities for easily finding precisely the tenders they are interested in as the main advantage. They consider that using the CPV saves time and is helpful. A significant reason for limited usefulness of the system for bidders is incorrect use of the codes by buyers. Besides giving rise to misleading and imprecise descriptions, this leads to incorrect search results. Additionally, bidders, like the buyers mentioned above, find that the system is too difficult and complicated to handle. Also, bidders find the system occasionally not transparent enough and due to incomplete code lists not useful for some companies offering specialised works/supplies/services. Several respondents stated that they value other search approaches, such as word searches, more than the CPV. This can be explained by the disadvantages of the CPV mentioned here. We come back to these aspects in sections 2.1.3 and 2.2 below.

Conclusion: Both buyers and bidders regard the CPV as generally useful. However, the current CPV has some drawbacks. These will be discussed below.

2.1.2 Buy side: Usefulness of the CPV for formulating procurement needs

We now look more specifically at the buy side, i.e. the usefulness of the CPV for contracting authorities when formulating procurement needs.

Quantitative analysis of the use of the CPV codes

CPV codes are used by contracting authorities when publishing contract notices on TED ("Tenders Electronic Daily"). All public procurement notices on TED must have a CPV code. Data on notices published on TED were used to calculate which code is used how often (cf. section 4.1 for methodological details), broken down by main and additional objectives in notices and lots[14].

The following table shows which codes were used most often from 2009 to 2011:

Table 1: Most used CPV codes 2009-2011

CPV	Level	Description	Notices - Main object	Notices - Additional object	Lots - Main object	Lots - Additional object	Total
33600000	2 – Group	Pharmaceutical products	4,566	391	129,843	4,254	139,054
33140000	3 – Class	Medical consumables	2,328	933	38,986	7,155	49,402
33690000	3 – Class	Various medicinal products	1,138	361	38,265	6,811	46,575
33141000	4 - Category	Disposable non-chemical medical consumables and haematological consumables	1,311	518	22,162	5,253	29,244
33696500	5 - Subcategory	Laboratory reagents	2,367	525	23,888	2,350	29,130
33100000	2 - Group	Medical equipments	3,739	854	21,313	2,729	28,635
33000000	1 - Division	Medical equipments, pharmaceuticals and personal care products	2,631	384	23,114	1,191	27,320
60130000	3 - Class	Special-purpose road passenger-transport services	2,359	878	16,719	5,163	25,119
45000000	1 - Division	Construction work	11,250	1,333	11,340	689	24,612
77200000	2 - Group	Forestry services	1,858	110	14,514	726	17,208

Most of the codes used are for groups or divisions, i.e. at a relatively high level of the CPV hierarchy. This indicates that the level of detail the CPV provides is not always used to its full extent. We come back to this below in section 2.2.3.

The codes presented in the table primarily have a high number of total usages because of their high number of occurrences in lots. However, there is one exception. "Construction work" (a division) is the code used most often when looking only at notices and not at lots. As will be seen

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[14] One CPV code is the "Main object"; several additional codes can be given as "Additional objects" to specify the subject of the notice further.

later, the structure of the CPV is believed to be sub-optimal in the areas of works (cf. sections 2.2.2 and 2.2.4 below). This may explain the high usage of the code at division-level.

Of the 9,454 codes available, 1,221 (13%) alone accounted for 80% of all usages. On the other hand, 642 codes were not used at all between 2009 and 2011. A further 5,521 codes were used fewer than 100 times. This implies that some codes are not relevant for public procurement (cf. Appendix 1 for a list of these codes). We will come back to this in section 2.2.3 below.

How contracting authorities use the CPV in practice

In relation to how contracting authorities use the CPV in practice, the discussion of codes with practitioners (cf. section 4.5) revealed that:

Contracting authorities do not use CPV internally to describe their needs or to structure them. The CPV becomes relevant only when the tender documents are fully completed and publication of the notification on SIMAP is pending. At the end of the preparation process of a tender, contracting authorities look for suitable codes. That means that CPV codes are generally based on specifications that have already been finalised. The CPV is not used for the actual procurement activities, i.e. procurement planning, implementation and service provision.

The CPV is used by contracting authorities when publishing tender notices. The interviews with practitioners showed that, in general, contracting authorities attempt to encode works, supplies and services procured as accurately as possible. If there is no matching code or if searching for a suitable one would be too time-consuming (due to the sometimes inconsistent structure in certain divisions (cf. section 2.2.2 below)), use is made of higher level codes.

The CPV codes are also used by Contracting Authorities to distinguish between works, supplies and services. It is, however, in the view of one interviewed expert confusing that the EU Procurement Directive[15] refers to no less than three product classification systems: NACE, CPC and CPV. Annex I of the Directive on the distinction between works and supplies/services uses both NACE and CPV. Annex II distinguishing II A and II B services uses both CPC and CPV. Furthermore the CPV is not the leading system. The Directive states: "In the event of any difference of interpretation between the CPV and the NACE/CPC, the NACE/CPC nomenclature will apply" (cf. footnotes in Annexes). In the expert's view only the CPV should be used in the EU Procurement Directives.

However, contracting authorities definitely see the potential the CPV offers when it comes to supporting bidders interested in finding relevant tenders. Contracting authorities are generally keen on having as many qualified bidders as possible participating in tenders, firstly in order to achieve the best possible prices through competition, and secondly, due to competition amongst bidders the possibility of achieving innovative solutions to their needs. In the view of contracting authorities, in a situation with no CPV – or any other classification system – it could be very difficult for companies interested in tenders to find suitable tenders. This is, as in the absence of the CPV the description of the tendered work/supply/service would be provided in textual form in the national language of the contracting authority only.

> **Conclusion:** Contracting authorities use the CPV when publishing tender notices. However, they see the benefit of this as being more on the bidders' side and use it less for their internal needs such as defining procurement needs.

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[15] Directive 2004/18/EC of the European Parliament and of the Council of 31 March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004L0018:en:NOT

2.1.3 Sell side: Usefulness of the CPV for identifying procurement opportunities

In the previous sections we looked at contracting authorities' behaviour and analysed which CPV codes are used how often by contracting authorities when publishing contract notices (buy side). In this section we take the opposite perspective and analyse how suppliers search for procurement opportunities and which CPV codes suppliers use how often for searching for contract notices that might be relevant for them (sell side).

There are several different possibilities for bidders when searching for tender notices that are relevant to them. Using CPV codes is only one of these. We compare different search approaches below, and aim to point out the advantages and disadvantages of the different approaches.

In the online survey bidders were asked which search approach they use most. Their responses are representative at EU-level, as the respondents are spread over all EU Member States and more than 3,500 bidders answered that question.

Figure 4: Search approaches for tender notices (bidders)

How do you usually search for tender notices relevant to you?

	Very often (>75% of all cases)	Often (50% to 75% of all cases)	Rarely (25% to 50% of all cases)	Very rarely (1% to 25% of all cases)	Never (0% of all cases)
Search by keywords (text search).	44%	28%	12%	10%	7%
Search by CPV codes.	22%	17%	16%	19%	26%
Search for names of specific contracting authorities.	16%	20%	23%	22%	19%
Search for notices from specific locations/regions (e.g. by NUTS codes).	17%	19%	18%	20%	27%

N = 3510 - 3693
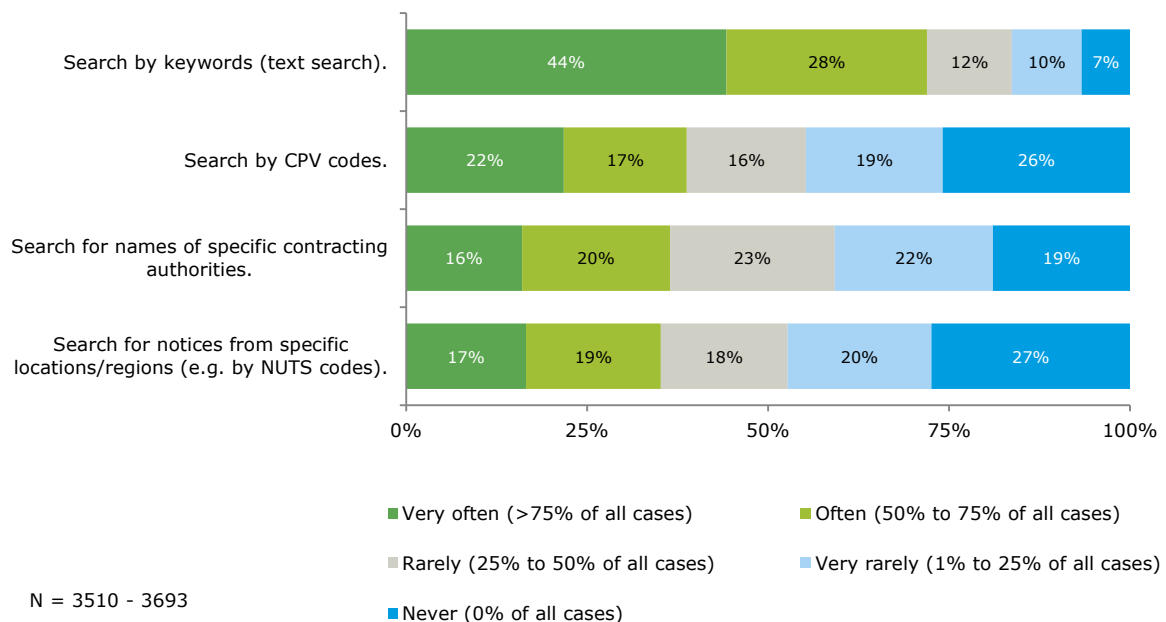
As Figure 4 shows, the dominant search approach for bidders to find relevant tender notices is to search by keywords. 44% of all bidders search by keywords in more than three of four cases. Even more than 70% use keywords in at least every second search. Less than 40% of the bidders use the CPV regularly. Searching for the names of specific contracting authorities and notices from specific locations/regions are used approximately as often as searching by CPV codes.

Hence, keyword search is preferred over the CPV codes as a search method.

This finding is also supported by data on user searches in TED. The Publications Office[16] provided data on user searches in TED for one week in April 2009. This data was available because it was once collected for testing purposes. The data consists of logs of 34,854 user searches on TED.

It recorded which search criteria each user applied when searching on TED. Searches can be performed by keywords, for locations or for CPV codes. In 5,528 of the 34,854 cases, the CPV

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[16] The Office for Official Publications of the European Communities (OPOCE) is the publishing house of the institutions and other bodies of the European Union (EU).

was used for the search – either alone or in combination with other search criteria. This represents only around 15% of all searches. This means users used the CPV in only a small minority of their searches.

Appendix 1 shows which codes were used how often by the users in their searches.[17]

Those bidders who do not use CPV codes on a regular basis were asked the reasons (Figure 5).

Figure 5: Reasons for not searching by CPV codes (bidders)

What are your reasons for <u>not</u> searching by CPV codes? (multiple choice)

I am not familiar with the CPV.	54%
CPV is difficult to use.	30%
CPV does not contain codes for the works/supplies/services we offer.	15%
Other	14%

N = 926
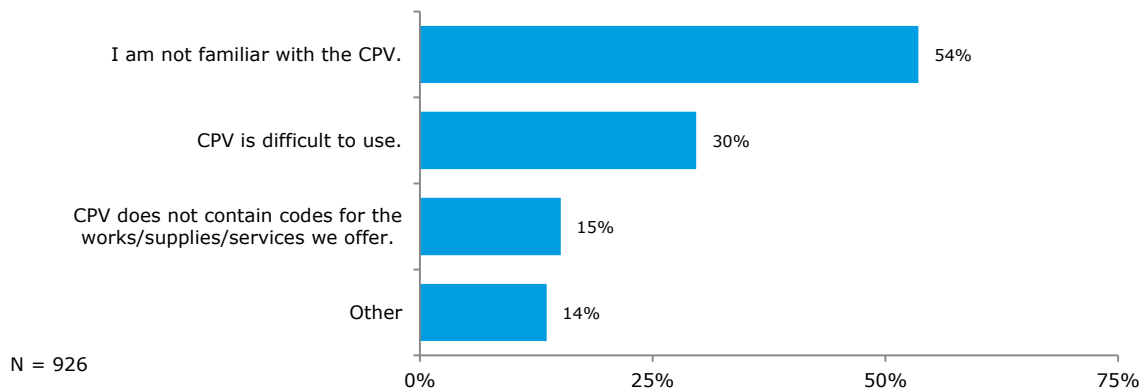
The majority of those bidders who do not regularly use the CPV as a search approach use other methods because they are not familiar with the CPV. Some of these bidders do not know the CPV at all while some of those bidders know the CPV but are not aware of the value of the CPV for searching tender notices. Another 30% explained their decision by saying that the CPV system is regarded as being too difficult to use. One in six believe that the CPV does not contain codes relevant to them.

"Other" reasons mentioned were mainly that (in order of frequency):
• other search approaches – especially text search – work better
• contracting authorities apply incorrect codes and
• different contracting authorities apply different codes for similar procurements.

Subsequent to the question on their usual search practice, bidders were asked to assess the different practical aspects of the four main search approaches:
• best overall search results,
• best results for identifying all relevant tender notices and
• best results for avoiding non-relevant tender notices.

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[17] The total number of codes used (35,922) differs from the total number of searches where CPV was used (5,528) because in one search several CPV codes can be applied.

Figure 6: Practicability of different search approaches (bidders)

Please identify which approach yields the best results.

N = 2637 - 3127

- Works best in general.
- Returns better search results in relation to identifying all relevant tender notices.
- Returns better search results in relation to avoiding non-relevant tender notices.
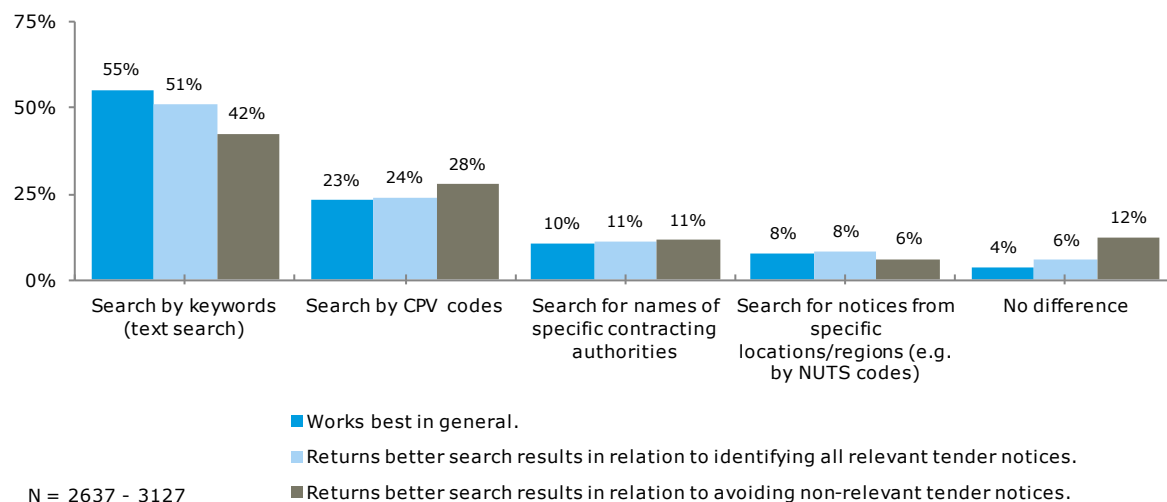
Consistent with the findings presented earlier, the dominant approach is keyword search (Figure 6). Keyword search yields the best results in general, returns all relevant results best and is best for avoiding non-relevant tender notices. In the view of the bidders, the CPV is the second best for all three aspects.

> **Conclusion:** Bidders use keyword search rather than CPV codes as a search method. The main reason is that bidders are unfamiliar with the CPV. Some bidders regard the CPV as difficult to use. Bidders feel keyword search works better for them, i.e. returns better search results.

2.1.4 Cross-border procurement

One of the purposes of the CPV is to facilitate cross-border procurement. Facilitating cross-border procurement increases competition within the Single Market, which leads to better value for money in public procurement. However, one of the obstacles in regards to cross-border procurement is the language barrier.[18] The CPV is designed to help overcome this barrier. The descriptions of the codes are available in all 23 EU official languages. This should help bidders from other countries identify relevant procurement opportunities. With the CPV it is no longer necessary to perform text searches in different languages. Instead, one search for specific CPV codes will return tender notices from all Member States.

As described above, however, bidders prefer other search techniques over the CPV for various reasons. The results of the survey were used to analyse whether those bidders who also tender cross-border use the CPV more than bidders tendering only in their home Member States.

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[18] Cf. Rambøll Management Consulting and University of Applied Sciences HTW Chur on behalf of DG MARKT, "Cross-border procurement above EU thresholds" (March 2011), section 4.1.2, http://ec.europa.eu/internal_market/publicprocurement/docs/modernising_rules/cross-border-procurement_en.pdf

The following Figure shows a comparison between bidders operating only domestically and bidders operating both domestically and internationally.

Figure 7: Bidders' use of the CPV domestically and cross-border

How do you usually search for tender notices relevant to you?

Very often (>75% of all cases)
Often (50% to 75% of all cases)
Rarely (25% to 50% of all cases)
Very rarely (1% to 25% of all cases)
Never (0% of all cases)
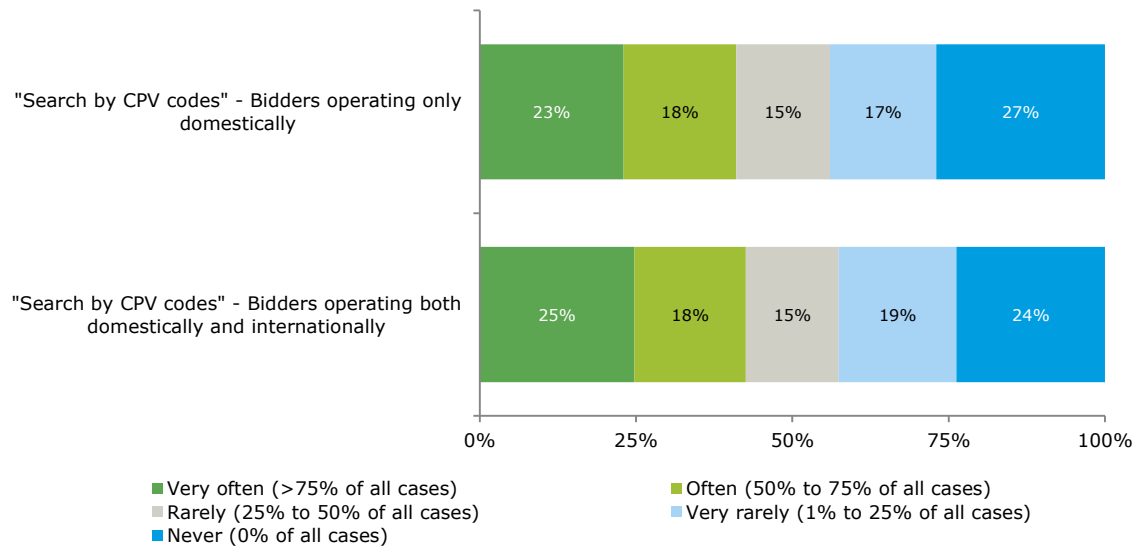
N = 3619

It turns out that about 40% of the bidders use the CPV "very often" or "often" - regardless of whether they bid only domestically or also internationally.

Additionally, bidders were asked whether they use the CPV to identify tenders that might be relevant from other countries where the call for tender is in a foreign language. Of those who bid internationally, 47% answered that they use the CPV for identifying tenders from abroad which are in foreign languages. This is only slightly more than the general use of the CPV.

Conclusion: One of the key features of the CPV is that it is a multi-lingual tool. The CPV is used in equal measure to identify cross-border procurement opportunities and domestic opportunities.

2.1.5 Below EU-thresholds procurement

The use of the CPV is only mandatory for procurement above EU-thresholds, but may be applied in below-threshold procurement. This section presents a brief analysis of below-threshold procurement.

The main EU-thresholds are currently set at:[19]
- €130,000 for service and supplies contracts under the 'Classical' Directive (2004/18/EC)[20] awarded by central government authorities[21];
- €200,000 for service and supplies contracts under the 'Classical' Directive (2004/18/EC) awarded by contracting authorities other than those belonging to the central government;
- €400,000 for service and supplies contracts under the Utilities Directive (2004/17/EC)[22];
- €5,000,000 for works contracts.

In the survey, buyers were asked whether they usually use the CPV below the EU-thresholds and to explain their practice.

Figure 8: Use of the CPV for tender notices below EU-thresholds (contracting authorities)

Do you use the CPV for tender notices below EU-thresholds?

Legend:
- Yes, always.
- Yes, sometimes (for approx. 25% to 50% of notices).
- Yes, but only rarely (less than 25% of notices).
- No, never.
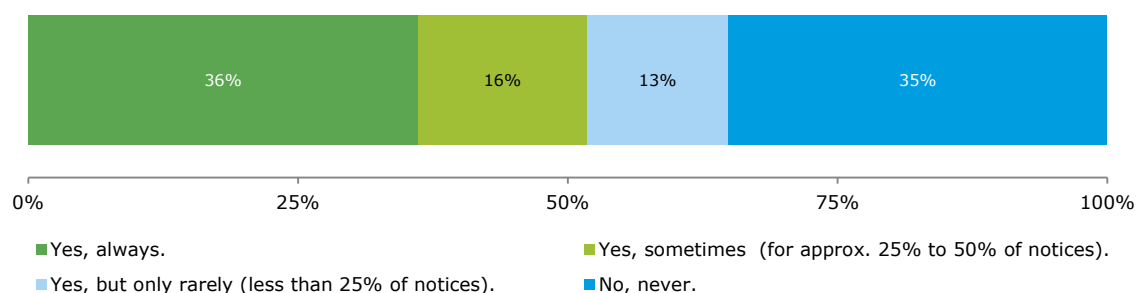
N = 2797

As Figure 8 shows, a relatively high proportion of buyers use the CPV below EU thresholds even though this is not mandatory. A further 36% say that they would always use the system in those cases. Only 35% of all buyers never use the CPV below EU thresholds.

Those buyers who also use the CPV below the EU-thresholds gave several reasons for this. The most frequently mentioned reason was that the application of EU procurement rules, including the use of the CPV, is mandatory in some Member States also below EU-thresholds.

In order to obtain more insights on the Member States in which the CPV is also used below EU thresholds, we further analysed the information obtained through the online survey. As stated above, bidders were asked for their reasons for also using the CPV below EU thresholds. This information was correlated with information on national thresholds from an overview table provided by DG Markt.[23] Combining these two sources of information, it can be concluded that the use of the CPV is mandatory between certain national thresholds and EU thresholds in the Member States shown in the following table.

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[19] Cf. Regulation (EC) 1251/2011

[20] Directive 2004/18/EC of the European Parliament and of the Council of 31 March 2004 on the coordination of procedures for the award of public works contracts, public supply contracts and public service contracts, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:134:0114:0240:EN:PDF

[21] I.e. listed in Appendix IV of the Classical Directive (2004/18/EC)

[22] Directive 2004/17/EC of the European Parliament and of the Council of 31 March 2004 coordinating the procurement procedures of entities operating in the water, energy, transport and postal services sectors, http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:134:0001:0113:en:PDF

[23] Cf. Commission Staff Working Paper "Evaluation Report - Impact and Effectiveness of EU Public Procurement Legislation", SEC(2011) 853 final, Part 2, Annex 5, http://ec.europa.eu/internal_market/publicprocurement/docs/modernising_rules/er853_2_en.pdf

However, it should be borne in mind that these are the only sources for the table and that it was beyond the scope of this study to carry out further verification by consulting national legislation or interviewing national experts. Furthermore, for some Member States the information collected was inconclusive. Thus, the information should be taken as indicative since the information in the table might be partially inaccurate and applying the CPV might be mandatory in even more Member States. The analysis is presented here because in our view it nevertheless provides some insights into the relevance of the CPV for procurement below EU thresholds.

Table 2: Member States where CPV use is also mandatory below EU thresholds

EU/EEA Member States[24]		National threshold(s) above which use of CPV is mandatory[25]
BE	Belgium	€ 67,000
CZ	Czech Republic	Supplies and services: € 70,000 Works: € 210,000
DK	Denmark	€ 67,000
FI	Finland	n/a (CPV mandatory but thresholds unknown.)
FR	France	€ 90,000
HU	Hungary	Supplies and services: € 26,700 Works: € 50,000 Supplies and services in the utilities sector: € 166,700 Works in the utilities sector: € 333,300
IT	Italy	Works: € 750.000
LT	Lithuania	Supplies and services: € 30,000 Works: € 145,000
LV	Latvia	Supplies and services: € 30,000 Works: € 170,000
MT	Malta	€ 120,000
NO	Norway	n/a (CPV mandatory but thresholds unknown.)
PL	Poland	€ 14,000
RO	Romania	Supplies and services: € 100,000 Works: € 750,000
SI	Slovenia	Supplies and services: € 40,000 Works: € 80,000
SK	Slovakia	Supplies and services: € 60,000 Works: € 360,000

Caveat: Information presented in this table could not be verified and is thus indicative.

In addition, several buyers surveyed mentioned that the IT system they use for the publication of notices imposes the application of CPV codes. Finally, some bidders stated that applying CPV codes is regarded as a standard procedure in their organisation in order to attract as many bidders as possible.

The use of the CPV for below-threshold procurement was also analysed quantitatively. The aim of this analysis was in particular to check whether codes used only seldom for above-threshold procurement are used more frequently for below-threshold procurement.

In some Member States, the CPV is used on national procurement portals for publication of contract notices for below-threshold procurement. It was possible to obtain data from three Member States:

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[24] Only those Member States are shown where it could be concluded that the use of the CPV is mandatory below EU-thresholds.

[25] Cf. Commission Staff Working Paper "Evaluation Report - Impact and Effectiveness of EU Public Procurement Legislation", SEC(2011) 853 final, Part 2, Annex 5, http://ec.europa.eu/internal_market/publicprocurement/docs/modernising_rules/er853_2_en.pdf

- The Finnish Social Science Data Archive provided data on below-threshold procurement notices in 2011 and the CPV codes applied.[26]

- The Swedish Competition Authority provided data on information from one of the commercial databases for public procurement in Sweden. The database contains notices for public procurement both above and below the EU thresholds, and the information in the database makes it possible to see how often the different CPV codes are used. Data were provided about the use of CPV codes for both above- and below-threshold procurement in 2010 .

- In the UK, Contractsfinder is a central source for public procurement notices. Data on tender notices are publicly available for download.[27] Data for seven months was available and analysed (February 2011 and November 2011 to April 2012).

The information obtained is presented in Appendix 1.

Overall, the analysis shows that codes used only seldom for above-threshold procurement are also used only seldom for below-threshold procurement. As noted above, 642 codes were not used above the thresholds in 2009-2011. Of these 642 codes, only 19 were used below the thresholds according to the data available from Finland, Sweden and the UK. However, most of these 19 codes were used only once or twice. The only exception is "73424000 Development of warships". This occurs seven times in the data available for below-threshold procurement (cf. Appendix 2).

The following chart compares the frequency of the use of the codes above and below threshold by divisions. The divisions have been ranked from 1 (most used) to 45 (least used). For each division the rank of use above and below EU-thresholds is shown. The horizontal axis represents the frequency of use above thresholds and the vertical axis the frequency of use below thresholds. Points close to the line crossing the chart have a similar frequency of use above and below EU-thresholds.

In general, divisions used more frequently above the thresholds are also used more frequently below the thresholds. For example:
- Division 45 ("Construction work") is the second-most used division above the thresholds and the most used division below them.
- Division 41 ("Collected and purified water") is the least used division in both cases
(cf. green dots in chart).

However, as the Figure shows, there are some exceptions to this general correlation. For example:
- Division 15 ("Food, beverages, tobacco and related products") is more relevant above the thresholds (rank 5 above the thresholds but only 41 below).
- Division 73 ("Research and development services and related consultancy services"), on the other hand, is more relevant below the threshold (rank 36 above the threshold but rank 16 below)
(cf. red dots in chart).

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[26] Public Procurement Notices 2011 [computer file]. FSD2712, version 1.1 (2012-03-16). Tampere: [distributor], 2012.
[27] http://www.contractsfinder.businesslink.gov.uk/data-feed.aspx?site=1000&lang=en

Figure 9: Most and least used divisions above and below the thresholds
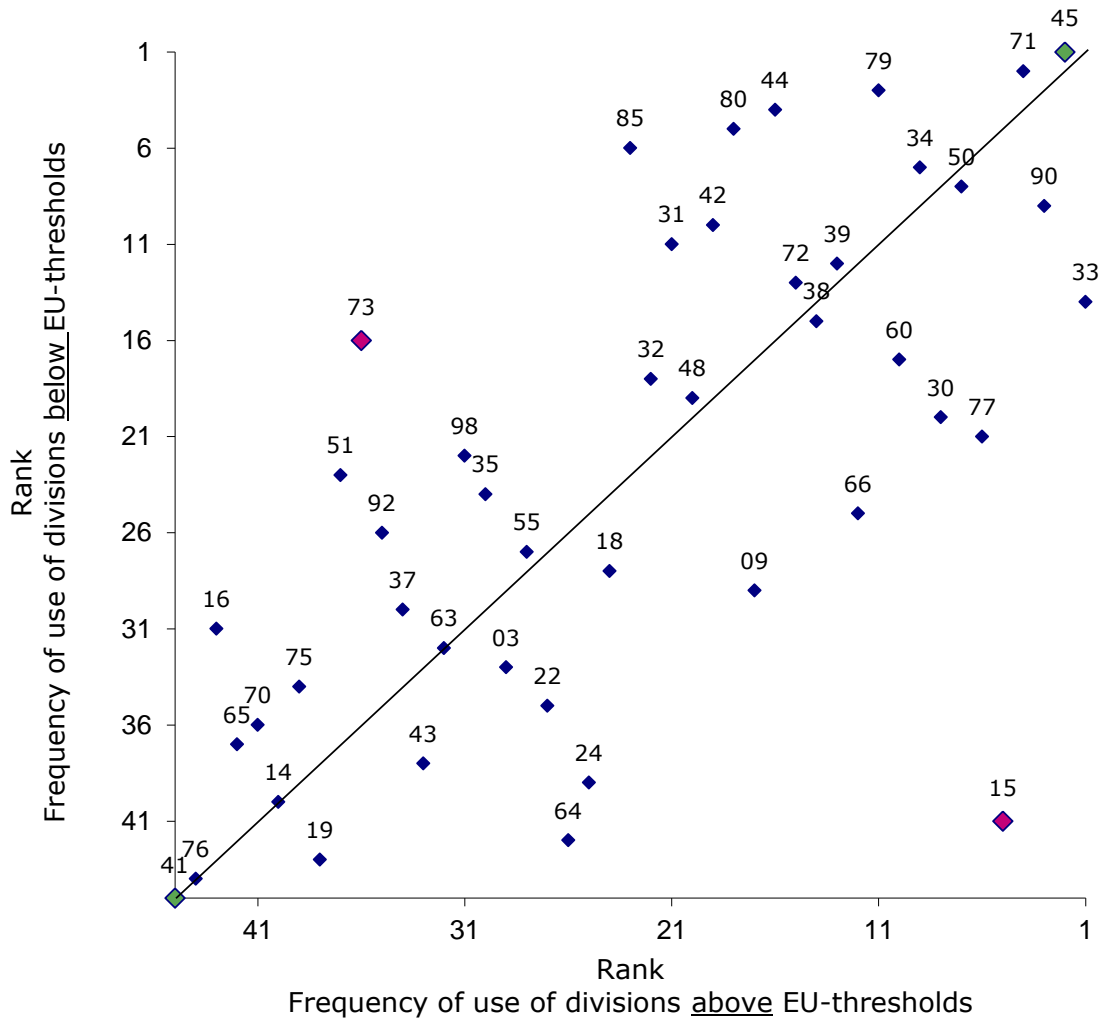
Conclusion: The CPV is also used below-thresholds and the patterns of use are roughly the same above and below the thresholds.

2.1.6 Costs and benefits/impacts of the CPV

This section presents the findings collected on the costs and benefits/impacts of the CPV.

In terms of the cost to buyers of applying the CPV, interviews with practitioners showed that they do not incur high costs. Procurement officers who specialise in a particular commodity group usually have the experience to identify which codes are appropriate and which are not. They do not look for a matching code for each new tender, but try to orient themselves on past tenders and make use of codes already identified as suitable in the light of past experience.

Regarding bidders, these were asked in the online survey to assess the effort level in using the CPV system.

Figure 10: Bidders - Effort level of CPV usage

How appropriate do you find the effort level in using the CPV code?

| 6% | 50% | 28% | 16% |

0%   25%   50%   75%   100%

■ Very appropriate   ■ Appropriate   ■ Less appropriate   ■ Inappropriate

N = 2457
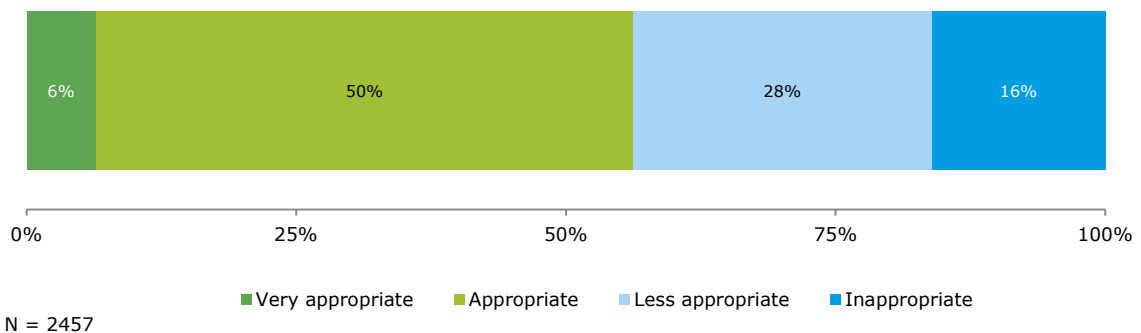
As Figure 10 shows, the majority of bidders deem the effort level of the system appropriate. Only a minority finds that the effort level is less appropriate or inappropriate.

This suggests that the CPV implies only marginal costs for both contracting authorities and bidders.

In terms of the benefits/impacts of the CPV, the following figures present the result of questions related to the intervention logic presented in section 1.2 of this report. Both bidders and buyers were asked broadly the same questions, but slightly adapted to their role in the procurement process.

Figure 11: Buyers - Impacts of CPV codes following intervention logic

Do you agree?

CPV codes allow more bidders to become aware of my notices. — 70%

CPV codes allow more bidders from abroad to become aware of my notices. — 60%

These (national and international) bidders lead to more competition. — 61%

This competition leads to better value for money. — 56%

0%   25%   50%   75%

N = 2711 - 2817
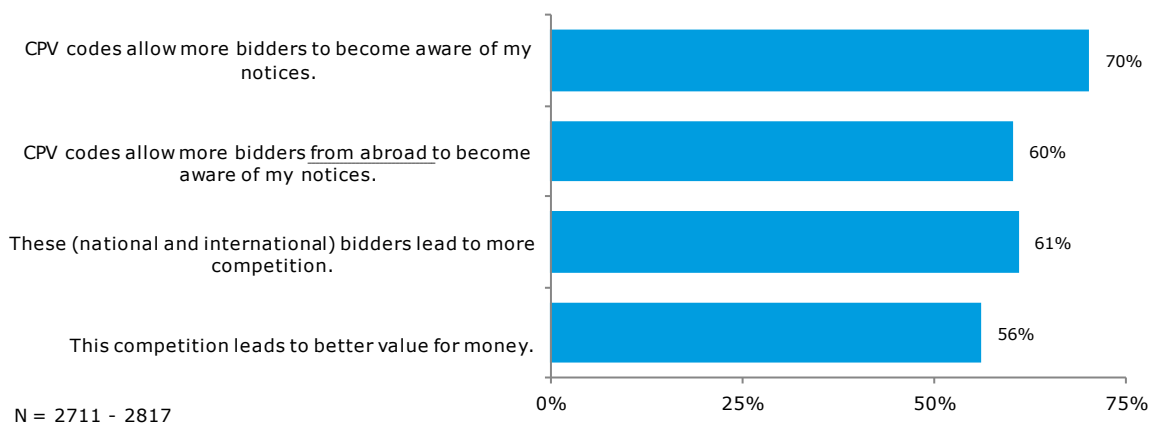
Figure 12: Bidders - Impacts of CPV codes following intervention logic

Do you agree?

N = 2961 - 3112

CPV codes allow me to become aware of more notices.	57%
CPV codes allow me to become aware of more notices from abroad.	48%
In general, this leads to more competition.	50%
This competition leads to more business opportunities.	45%
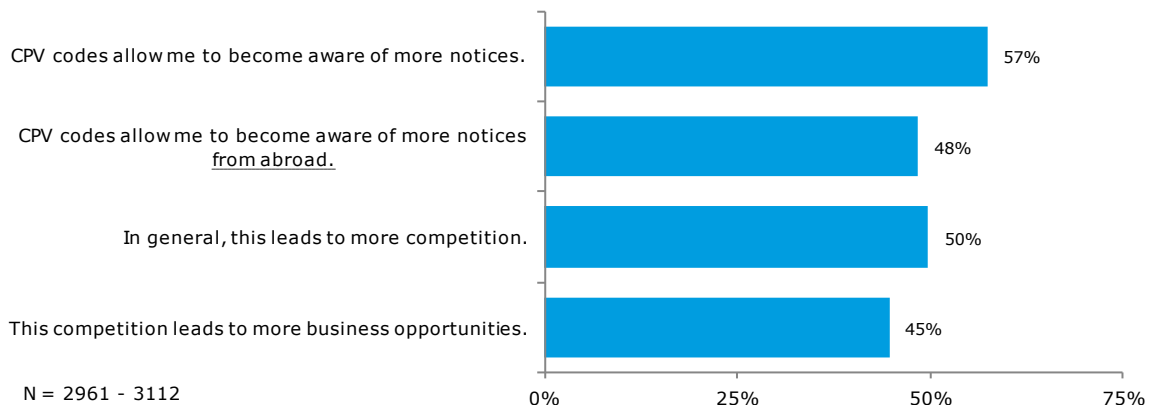
More than half the buyers surveyed see a positive contribution from the CPV codes at each step of the intervention logic. As Figure 11 shows, 70% of the buyers think that the codes allow more bidders to become aware of their notices and 56% state that the CPV leads to better value for money.

The bidders surveyed are slightly less positive about these aspects of the intervention logic. This is shown in Figure 12, where 57% state that the CPV allows them to become aware of more tender notices, and 48% think this holds also true for notices from other countries. Finally, 45% of the bidders perceive that the CPV leads to more business opportunities.

Even though buyers are more positive about these aspects of the intervention logic, these responses show that both groups perceive the CPV as having a significant positive impact

The survey responses confirm the intended intervention logic of the CPV system. Many of the contracting authorities surveyed perceive that they get better value for money. And many of the survey bidders perceive that there are more business opportunities as a result of the CPV.

Conclusion: Both contracting authorities and bidders incur only marginal costs by applying the CPV. At the same time both groups perceive that there are significant positive impacts. Contracting authorities perceive that they get better value for money and bidders perceive that the CPV provides them with more business opportunities.

2.2   Explanatory factors for the current level of functioning of the CPV

The previous sections provided an assessment of the usefulness of the current CPV. They demonstrated that the CPV is regarded as generally beneficial. However, some weaknesses in the CPV became apparent as well.

The following sections provide explanations for the weaknesses in the CPV identified by this study. First we analyse the set of CPV codes provided by the CPV Regulation. This relates to the coverage and completeness of the CPV, the structure of the CPV and the level of detail of the CPV. Then we analyse the application of the CPV by its users by looking at the extent of correct use by contracting authorities.

2.2.1 Coverage and completeness of the CPV

Two methods were used to analyse the coverage and completeness of the CPV: a comparison of the CPV with other classification systems, and discussion of the codes with practitioners. Details of the methodologies applied can be found in sections 4.7 and 4.5, and below.

The comparison of the coverage of the CPV with other classification systems was quantitative and qualitative.

1. Quantitative comparison

In the first step, we sought to obtain an overview of the coverage of the CPV. We investigated the extent to which the CPV does not cover the other classification systems and vice versa. For this we use quantitative results from the CEN cMap mapping (cf. section 4.7 below).

Within the cMap project, the CPV categories were compared with the categories of the other classification systems. Each comparison conducted was rated. The rating helped us to estimate the extent of coverage of the CPV. Table 3 below indicates the percentage of cases in which "There is at least one category in the other classification system where no class is available in the CPV".

Table 3: cMap mapping results (%)

	CPV	eCl@ss	GPC	UNSPSC
CPV		23%	13%	33%
eCl@ss	34%		14%	35%
GPC	35%	33%		37%
UNSPSC	28%	30%	9%	

Comparison to eCl@ss:
- In 23% of the cases there is at least one category in eCl@ss for which there is no class available in the CPV.
- Vice versa, in 34% of the cases there is at least one category in the CPV and no class is available in eCl@ss.

Comparison to GPC:
- In 13% of the cases, there is at least one category in GPC and no class available in the CPV. Only the UNSPSC with 9% does better in direct comparison with the GPC.
- Vice versa, in 35% of the cases there is at least one category in the CPV and no class is available in the GPC.

Comparison to UNSPSC:
- In 33% of the cases, there is at least one category in the UNSPSC and no class is available in the CPV. Neither eCl@ss with 35% nor GPC with 37% does better in the direct comparison with the UNSPSC.
- Vice versa, in 28% of the cases there is at least one category in the CPV and no class is available in the UNSPSC.

The quantitative comparison shows that the coverage of the CPV is broad in comparison with eCl@ss and the GPC. Only the UNSPSC performs better.

2. Qualitative comparison

In the second step, we analysed what might be missing in the CPV in comparison to the other classification systems.

The CWA 16138[28] includes an analysis that shows in detail which divisions are covered by the other standards. The results were:[29]

Divisions missing in the CPV system in comparison with the eCl@ss system:
- Packing material (20000000)
- Manufacturing facilities, workshop equipment, tool (21000000)
- Installation (complete) (33000000)
- Semi-finished products, materials (35000000)
- Marketing (41000000)
- Interim class (unclassified) (90000000).

Divisions missing in the CPV system in comparison with the GPC system:
- 10 Pet Care/Food
- 58 Cross-Segment
- 80 Tools/Equipment – Hand
- 81 Lawn/Garden Supplies
- 82 Tools/Equipment – Power
- 84 Tool Storage/Workshop Aids.

Divisions missing in the CPV system in comparison with the UNSPSC system:
- 24 Material Handling and Conditioning and Storage Machinery and their Accessories and Supplies
- 26 Power Generation and Distribution Machinery and Accessories
- 27 Tools and General Machinery
- 32 Electronic Components and Supplies
- 94 Organisations and Clubs.

At first glance it would seem that there are quite a few elements missing in the CPV. However, a closer look puts this into perspective:
- The UNSPSC division "Organisations and Clubs" (94000000) does not contain supplies, services or works;
- Both GPC's "Cross-Segment" and the eCl@ss "Interim class" do not contain substantive content, but refer exclusively to any other class that is not yet integrated into these standards and help to exchange data nevertheless with the help of these dummy classes. They are therefore not to be regarded as real segments that represent the requirements of any industrial branch or market.

We carried out a first analysis of the GPC division "Lawn/Garden Supplies" (81000000) and found that all the elements at the 2nd level are actually covered by the CPV. This is illustrated by the following table.

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[28] CEN Workshop Agreement on "Classification and catalogue systems used in electronic public and private procurement", ftp://ftp.cen.eu/CEN/Sectors/List/ICT/CWAs/CWA16138.pdf
[29] The analysis did not continue to the 4th level; therefore the classes identified could be part of different segments.

Table 4: GPC division "Lawn/Garden Supplies" (81000000) and CPV coverage

GPC division "Lawn/Garden supplies" (81000000)		Possible coverage of the CPV	
GPC class	**GPC Description**	**CPV code**	**CPV description**
81010100	Pools/Ponds/Water Features & Ornaments	43324100	Equipment for swimming pools
81010200	Chemicals/Treatments	24450000	Agro-chemical products
81010300	Furniture/Furnishings	39142000	Garden furniture
81010400	Watering Equipment	16400000	Spraying machinery for agriculture or horticulture
81010500	Fencing	44312000	Fencing wire
81010600	Plants	03451000	Plants
81010700	Waste Disposal	39234000	Compost boxes
81010800	Cooking/Heating Appliances	42214110	Grills
81010900	Power Tools	43313200	Snowblowers
81011000	Outdoor Structures	44211500	Glasshouses
81011100	Weather Monitoring/Observation	38127000	Weather stations
81011200	Equipment	16311000	Lawnmowers
81011300	Hand Tools	44511000	Hand tools
81011400	Testing Diagnostic Equipment	38434500	Biochemical analysers
81011500	Soil/Soil Amendments	24400000	Fertilisers and nitrogen compounds
81011600	Lighting	31527200	Exterior lights
81011700	Animal Repellents/Deterrents	24613100	Bird-scaring cartridges

The quantitative analysis of the coverage of the CPV at division level in comparison to the other classification systems showed that there might be some elements missing in the CPV. However, a closer look at the results showed that only a very few detailed elements might be missing and not broader groups of works, supplies or services. For the example analysed (GPC division "Lawn/Garden Supplies" (81000000)), it was not in practice possible even to identify any missing elements in the CPV. The difference between the classification systems is rather that the single items are structured differently. Thus, we conclude that the CPV has broad coverage in comparison to the other classification systems.

Procuring systems/packages

In the discussion with practitioners another aspect emerged: codes refer to specific subjects of contracts; yet there are requests where items from different divisions need to be combined.

Each division relates either to works, supplies or services. There are no "mixed" divisions combining supplies and services. This avoids any misunderstanding on the type of purchases encompassed by a code.

In practice, contracting authorities also procure wider systems or packages of services. Such purchases include various components, which are usually described in a variety of CPV divisions. In the current structure, the CPV does not provide single codes for describing such systems or packages. Public authorities have to use different codes that will each represent a part of the system. This can create difficulties for interested bidders.

There is an example of such a system in the area of television: a call for tenders might be for stage directions, including planning and implementation services, as well as hardware and software components. (Alternatively, one could use the following code: "Motion picture and video services" (92100000).)

Another example covering both supplies and services is printing and delivery of brochures. Here the following codes have to be combined: "Brochures" (22150000) – which are encoded as a supply – and "Photogravure services" (79822200) – which are encoded as a service.

The online survey confirmed this observation. Respondents reported problems in identifying the fitting codes when procuring systems/packages of different systems/packages.

However, TED provides the possibility for applying several codes to one tender notice. This should help to classify notices that cover systems/packages of different goods/services/works.

> **Conclusion:** The coverage of the CPV is generally complete. No general subject areas are missing, but some specific single codes may be. There are problems when procuring systems/packages covering supplies and services and/or more than one code, but the ability to apply several codes to one notice mitigates this issue.

2.2.2 Structure of the CPV

The CPV follows a tree structure, following a hierarchy of divisions (first 2 digits), groups (3rd digit), classes (4th digit), categories (5th digit) and subcategories (6th to 8th digits). Overall, there are 45 divisions, 272 groups, 1,002 classes, 2,379 categories and 5,756 subcategories (9,454 codes in total).

The following table shows an example.

Table 5: Example – CPV's hierarchical tree structure

Code	Level	Description
15 0 0 0 000	Division	Food, beverages, tobacco and related products
15 1 0 0 000	Group	Meat
15 1 3 0 000	Class	Meat products
15 1 3 1 000	Category	Meat preserves and preparations
15 1 3 1 100	Subcategory	Sausage-meat products
15 1 3 1 130	Subcategory	Sausages
15 1 3 1 134	Subcategory	Black pudding and other blood sausages

The structure of the CPV was addressed during the discussion of codes with practitioners and compared with other classification systems. (In addition, Appendix 3 provides a quantitative analysis of the structure of the CPV).

2.2.2.1 Qualitative assessment of the structure of the CPV

In the discussion of codes with practitioners four recurring patterns of problems were identified with regard to the structure:
1. the hierarchical tree-structure is not consistent;
2. code classification levels are not conclusive;
3. codes do not match the subject of the superordinate level;
4. codes are not mutually exclusive.

Additional detail on these patterns is provided below. To illustrate the examples we use tables in the format of the table above. The relevant aspects are highlighted in the tables.

1. The hierarchical tree-structure is not consistent

The hierarchical tree-structure of the CPV is not always implemented consistently. There are codes at a higher level of classification which are not followed by codes at lower levels of classification. The following example illustrates this. At code "71900000 Laboratory services" the hierarchical tree ends at group level. Classes, categories and subcategories are missing.

Table 6: Example – CPV's hierarchical tree structure is not consistent

Code	Level	Description
71 0 0 0 000	Division	Architectural, construction, engineering and inspection services
71 9 0 0 000	Group	Laboratory services
71 9 x 0 000	Class	not available
71 9 x x 000	Category	not available
71 9 x x xxx	Subcategory	not available

In cases where the hierarchical tree structure within a division is not implemented in consequence, it is difficult for users to orient themselves within the CPV structure.

This finding is also supported by findings from the literature review. For example, Polo, Álvarez, Rubiera (2008, p. 3) argues that:

"The tree-based structure between product terms is interpreted then as a logical is-a hierarchy. From our point of view […] hierarchical links between the elements of each economic sector do not have the semantics of subsumption relationships. […] the relationship between the element "Parts and accessories for bicycles" (34442000-7) and its direct antecessor, "Bicycle" (34440000-3), does not seem as an is-a relation. In this case, an ontological property for object composition like hasPart would be much better."

In general their argument criticises the inconsistency in the logic of the CPV system with regard to two possible relationships between classification levels, namely "is-a" and "has-part" relationships. The following graphic illustrates this inconsistency in the example provided in the quote:

Figure 13: Types of relationship between CPV classification levels
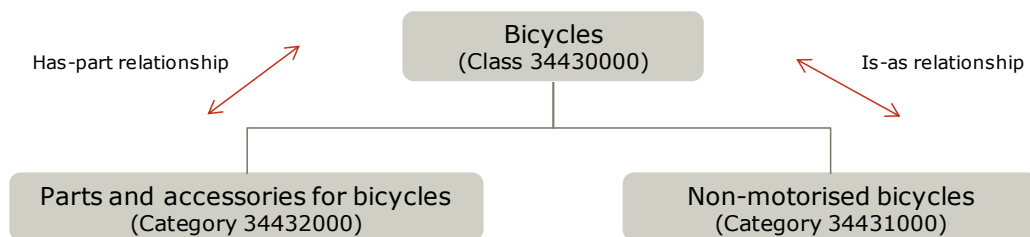
Two different types of logic inconsistency can be identified: first, different types of codes exist at the same classification level. The code "Parts and accessories for bicycles" is not of the same nature as the code "non-motorised bicycles". Second, the introduction of an "is-a" relationship (i.e. a non-motorised bicycle is a bicycle) seems redundant since the class "Bicycles" exists alongside the classes "Motor scooters and cycles with auxiliary motors" and "Motorcycles" and is hence by definition limited to non-motorised bicycles.

Therefore, the article finds that the CPV system is not incomplete but inconsistent, i.e. follows different logics in its construction.

2. Code classification levels are not conclusive

The hierarchical tree structure of the CPV implies that works, supplies and services that are classified at a certain level stand in a certain logical relationship to each other. We have identified three patterns where codes' classification levels are not conclusive:

1. Similar works, supplies and services are classified at different classification levels;
2. Works, supplies and services that should be classified at different levels are classified at the same level;
3. An element is missing within different levels of classification.

The three patterns are illustrated below with examples.

The following table shows an example where similar services are classified at different classification levels. "Economic research services" (79311400) are classified at subcategory level but "Market research" (7931 0000) is classified at class level. It is unclear why these two items are encoded at different classification levels.

Table 7: Example - Similar services are classified at different classification levels

Code	Level	Description
79 0 0 0 000	Division	Business services: law, marketing, consulting, recruitment, printing and security
79 3 0 0 000	Group	Market and economic research; polling and statistics
79 3 1 0 000	Class	Market research
79 3 1 1 000	Category	Survey services
79 3 1 1 100	Subcategory	Survey design services
79 3 1 1 200	Subcategory	Survey conduction services
79 3 1 1 300	Subcategory	Survey analysis services
79 3 1 1 400	Subcategory	Economic research services

The following table shows an example where products should be classified at different levels but are classified at the same level. There is a category called "Herbs and spices" (15872000) with the subcategories "Spices" (15872200) and "Herbs" (15872300). But at the same level we find the subcategories "Pepper" (15872100), "Salt" (15872400) and "Ginger" (15872500). These products should not be at the same level as "Spices" but at a level below.

Table 8: Example - Products should be classified at different levels but are classified at the same level

Code	Level	Description
15 0 0 0 000	Division	Food, beverages, tobacco and related products
15 8 0 0 000	Group	Miscellaneous food products
15 8 7 0 000	Class	Condiments and seasonings
15 8 7 2 000	Category	Herbs and spices
15 8 7 2 100	Subcategory	Pepper
15 8 7 2 200	Subcategory	Spices
15 8 7 2 300	Subcategory	Herbs
15 8 7 2 400	Subcategory	Salt
15 8 7 2 500	Subcategory	Ginger

The following table shows an example for missing elements at different levels of classification. There is a group called "Postcards, greeting cards and other printed matter" (22300000). This group consists of two classes: "Postcards" (22310000) and "Greeting cards" (22320000)). However, there is no "Other printed matter" class as suggested by the name of the group.

Table 9: Example - An element is missing within different levels of classification

Code	Level	Description
22 0 0 0 000	Division	Printed matter and related products
22 3 0 0 000	Group	Postcards, greeting cards and other printed matter
22 3 1 0 000	Class	Postcards
22 3 1 1 000	Category	Pictures
22 3 1 2 000	Category	Transfers
22 3 1 3 000	Category	Designs
22 3 1 4 000	Category	Photographs
22 3 2 0 000	Class	Greeting cards
22 3 2 1 000	Category	Christmas cards

To sum up: if a code's classification level is not conclusive, it is difficult for users to navigate within the structure. In these cases it is difficult for users to understand the underlying logic of the CPV.

3. Code does not match subject of the superordinate level

There are codes that do not match the subject of the superordinate classification level. For example, "Road salt" (34927100) should not be a subset of "Toll equipment" (34927000).

Table 10: Example – Code does not match subject of superordinate level

Code	Level	Description
34 0 0 0 000	Division	Transport equipment and auxiliary products to transportation
34 9 0 0 000	Group	Miscellaneous transport equipment and spare parts
34 9 2 0 000	Class	Road equipment
34 9 2 7 000	Category	Toll equipment
34 9 2 7 100	Subcategory	Road salt

Where a code does not match the subject of the superordinate level, it can be difficult for users to identify this code when navigating through the tree structure.

4. Codes not mutually exclusive

There are codes that are not mutually exclusive but overlap. This is illustrated by two examples:

- Within the division "Education and training services" (80000000), are two codes "Computer training services" (80533100) and "Computer courses" (80533200). But it is difficult to differentiate between the two. "Computer training services" and "Computer courses" are not mutually exclusive.

- The category "Spoons, forks" (39223000) is assigned to the class "Kitchen equipment, household and domestic items and catering supplies" (39220000). In contrast, there is also a class "Cutlery" (39240000) with a category "Knives and scissors" (39241000). However "Spoons, forks" should belong to "Cutlery". The two overlap but are located on different branches of the tree hierarchy. The following table illustrates the example.

Table 11: Example – Codes are not mutually exclusive

Code	Structure	Description
39 0 0 0 000	Division	Furniture (incl. office furniture), furnishings, domestic appliances (excl. lightning) and cleaning products
39 2 0 0 000	Group	Furnishing
39 2 2 0 000	Class	Kitchen equipment, household and domestic items and catering supplies
39 2 2 3 000	Category	Spoons, forks
39 2 2 3 100	Subcategory	Spoons
39 2 2 3 200	Subcategory	Forks
[...] 39 2 4 0 000	Class	Cutlery
39 2 4 1 000	Category	Knives and scissors
39 2 4 1 100	Subcategory	Knives
39 2 4 1 110	Subcategory	Table knives
39 2 4 1 120	Subcategory	Cooks' knives

Codes that are not mutually exclusive make it difficult for users to decide which code actually describes their work/supply/service best.

2.2.2.2 Comparison of the structure of the CPV with other classification systems

We examine the structure of different classification system in terms of the number of their elements and the distribution of the elements among the various hierarchical levels.

Background information on the other classification systems analysed can be found in section 4.7 below.

Comparing the distribution of groups, classes and categories per division, it turns out that the CPV is less well balanced than the other classification systems. This means that the tree structure of the CPV is suboptimal within specific divisions.

The following explanations illustrate this.

As the classification systems use different terms for the hierarchical levels, we use the terms from the CPV or "1st", "2nd", "3rd", "4th" level when comparing the systems.

First, we compared the classification systems in terms of the number of elements at each hierarchical level. Table 12 below shows that the CPV has 45 elements at the 1st level (divisions). Only the UNSPSC, with 55 elements, has more at the 1st level. This is an indication of basically good horizontal coverage.

When looking at the 4th level, it is notable that eCl@ss and the UNSPSC have four to five times more elements than the CPV with 8,135 categories and subcategories. This indicates that the CPV is not as detailed as the other classification systems at lower levels.

Table 12: Number of elements

Number of elements	CPV	eCl@ss	GPC	UNSPSC
1st level	45	27	36	55
2nd level	272	559	82	388
3rd level	1,002	4,953	450	3,113
4th level	8,135	27,053	2,923	38,099
Total	**9,454**	**32,592**	**3,491**	**41,655**

In the next step we compared the maximum and minimum number of categories and subcategories (4th level) per division (1st level) and the ratio of the number of divisions (1st level) and the number of categories and subcategories (4th level). The results are shown in Table 13 below. The number of elements differs in some places between the two tables due to differences in approach[30].

The minimum of the number of categories and subcategories in the CPV (2) is significantly smaller than in the other classification systems (eCl@ss 151, GPC 11 und UNSPSC 36). In the further analysis, we found that another division of the CPV has only a very small number of categories and subcategories.

Table 13: Statistical indicators

Statistical indicator	CPV	eCl@ss	GPC	UNSPSC
Number of 1st level elements	45	27	36	55
Number of 4th level elements	8,137	27,052	2,921	38,099
Average number of 4th level elements per 1st level element	181	1,040	83	693
Maximum number of 4th level elements per 1st level element	796	5,112	303	16,921
Minimum number of 4th level elements per 1st level element	2	151	11	36
Median number of 4th level elements per 1st level element	112	738	73	237

To find out if a small number of categories has implications for the structure of the CPV, we analysed the distribution of groups, classes and categories per division. The distribution is illustrated in the Figures below. The Figures show the ratio of the number of groups to classes and the proportion of categories per division.

The approach is illustrated by the following example. The division "Public utilities" (65000000) has five groups and seven classes, twelve elements at the 2nd and 3rd levels together, and only four elements at the 4th level. The groups and classes represent 75% of all elements of this division.

Table 14: Number of elements of "Public utilities" (65000000) division

Division	Description	Number of groups	Number of classes	Number of categories	Total
65000000	Public utilities	5	7	4	16
Share of total (%)			75%	25%	

The following figures show these distributions for all divisions/elements at the 1st level of the hierarchy for the four classification systems. It can be seen that the CPV is less well balanced (in terms of the distribution of groups, classes and categories per division) than the other

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[30] CPV - Number of elements at 4th level:

Table 22/23:   8,135/8,137

As there are no categories in the division "Collected and purified water" (41000000) we decided to assess the two classes of this division as categories. They are the lowest level at which a product can be classified.

eCl@ss - Number of elements at 1st level:

Table 22/23:   27/26

We decided not to count the division "Interim class (unclassified) " (90000000) to deliver a more realistic picture of the distribution. This also leads to one element fewer at the 4th level.

GPC - Number of elements at 1st level:

Table 22/23:   36/35

We decided not to count the division "Cross Segment" (58000000) to deliver a more realistic picture of the distribution. This also leads to two elements fewer at the 4th level.

classification systems. It is notable that in none of the other classification systems does the share of the elements of the 2nd and 3rd level compared to the 4th level exceed 40%. The CPV, however, has eight divisions where the ratio of the elements at the 2nd and 3rd level compared to the 4th level exceeds 40%.

Figure 14: CPV - distribution of groups, classes and categories per division
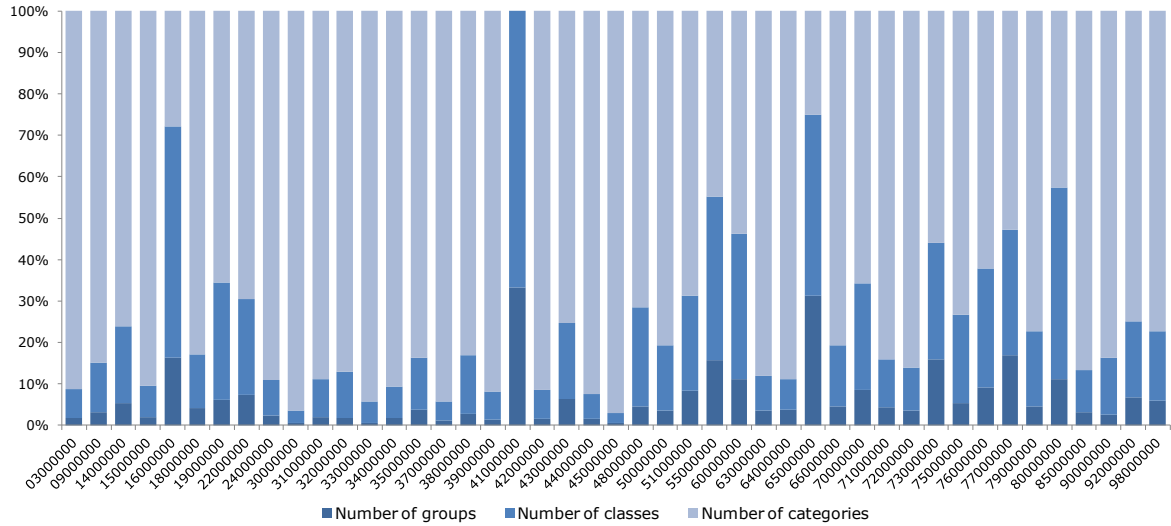
Figure 15: eCl@ss - distribution of groups, classes and categories per division
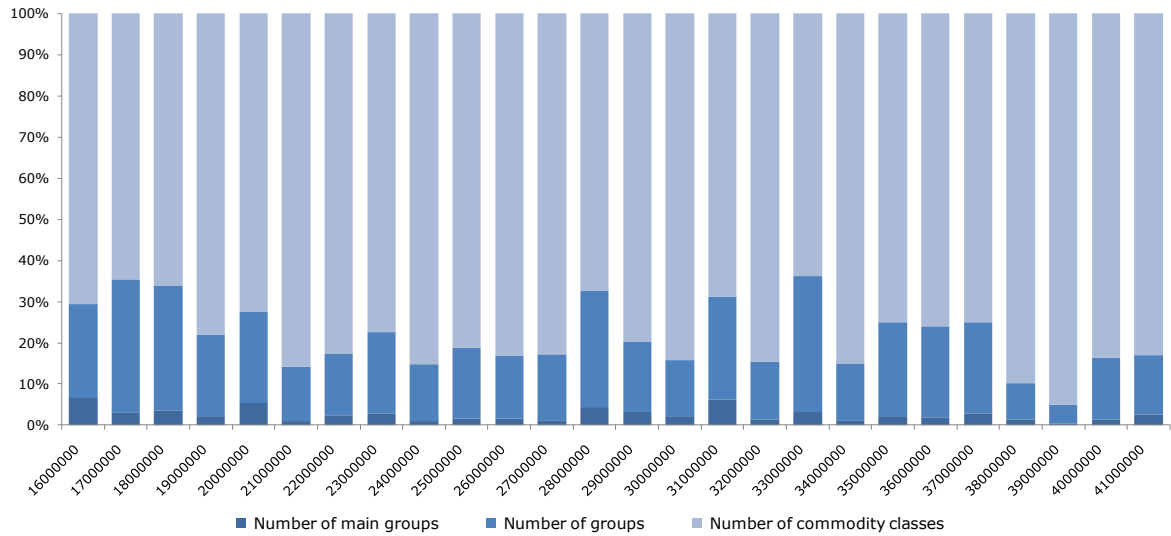
Figure 16: UNSPSC - distribution of groups, classes and categories per division

Number of families · Number of classes · Number of bricks
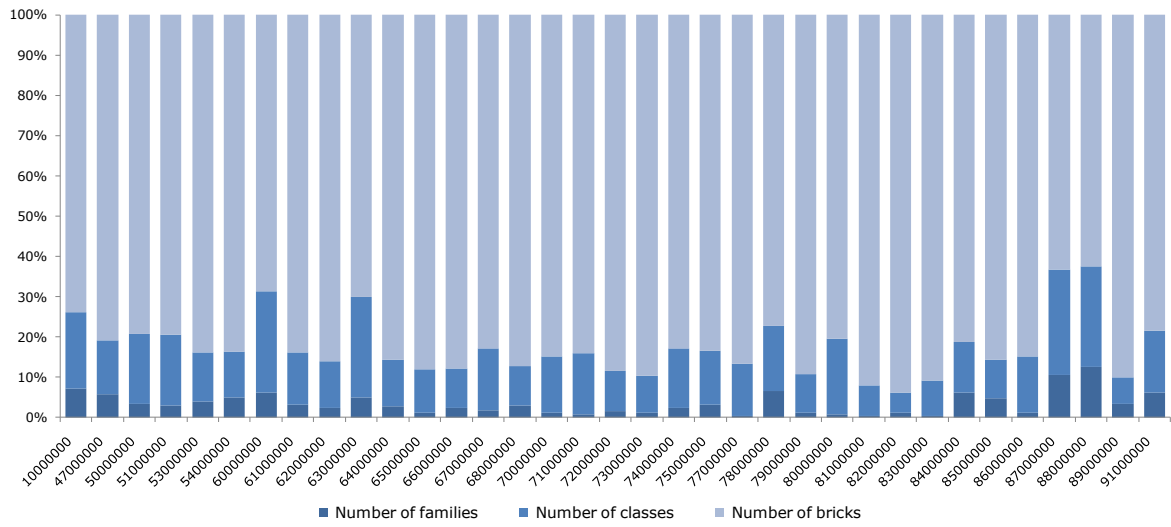
Figure 17: GPC - distribution of groups, classes and categories per division

Number of families · Number of classes · Number of commodities
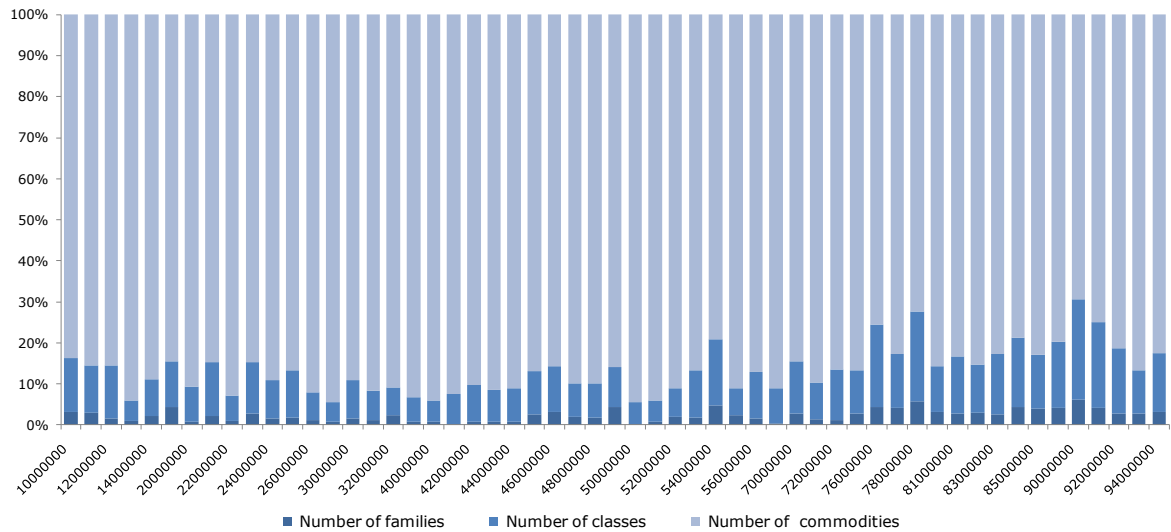
Table 15 below shows the eight divisions where there are discrepancies between the number of groups and classes and the number of categories. It shows the number of groups per division, the number of groups which have no class and the number of groups which have only one class. The same information is also shown for the relationship between classes and categories.

Table 15: Divisions with discrepancies

Division	Description	Number of groups	Group without a class	Group with only one class	Number of classes	Class without a category	Class with only one category
16000000	Agricultural machinery	7	1	0	24	19	4
41000000	Collected and purified water	1	0	0	2	2	0
55000000	Hotel, restaurant and retail trade services	6	1	1	15	9	1
60000000	Transport services (excl. Waste transport)	6	1	0	19	12	2
65000000	Public utilities	5	1	2	7	5	1
73000000	Research and development services and related consultancy services	4	1	0	7	4	0
77000000	Agricultural, forestry, horticultural, aquacultural and apicultural services	9	3	2	16	11	2
80000000	Education and training services	6	0	2	25	19	0
Sum		**44**	**8**	**7**	**115**	**81**	**10**
Total	**All divisions**	**272**	**18**	**21**	**1,002**	**317**	**111**

Figure 18 below illustrates this further for the division "Public utilities" (65000000). We find the group "65500000 Meter reading service" with no elements below it. The group "65200000 Gas distribution and related services" has only one class as does the group "65400000 Other sources of energy supplies and distribution".

The following classes have no categories:
• "65130000 Operation of water supplies"
• "65210000 Gas distribution"
• "65310000 Electricity distribution"
• "65320000 Operation of electrical installations"
• "65410000 Operation of a power plant"

The "65110000 Drinking-water distribution" class has only one category.

Figure 18: Tree structure of division "Public utilities" (65000000)
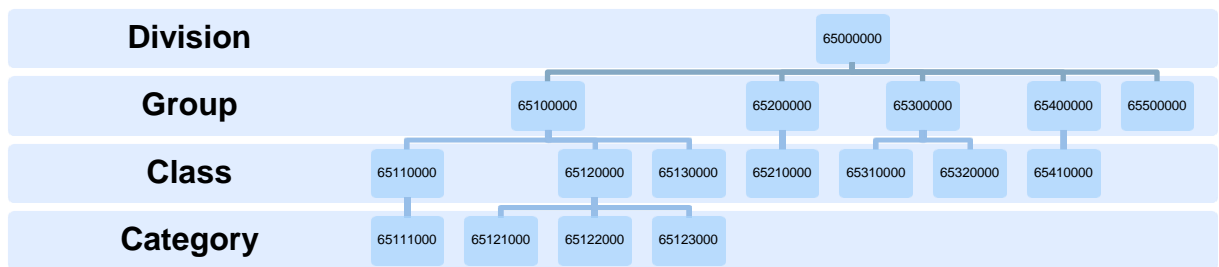
Thus, all classification systems have a hierarchical tree structure with basically four levels. Comparing the distribution of groups, classes and categories per division it transpires that the CPV is less well balanced than the other classification systems. This means that the tree structure of the CPV is suboptimal within specific divisions.

As explained above, several weaknesses of the structure of the CPV have been identified. However, account should be taken of the fact that the CPV covers a wide range of works, supplies and services and a high number of codes. Thus, it seems in our view unrealistic to expect that it would always be possible to structure all elements in a conclusive, mutually exclusive and well balanced way. Given the amount of codes, some inconsistencies might have to be accepted. Nevertheless, the structure of the CPV could be improved in line with the aspects outlined above.

Conclusion: The hierarchical tree structure of the CPV is not always consistent, the codes' classification level is not always conclusive, some codes do not match the subject of the superordinate level and some codes are not mutually exclusive. In comparison with other classification systems the CPV is less balanced. There is scope for improvement in the structure of the CPV, though it is probably unrealistic given its broad coverage to expect that all inconsistencies can be avoided.

2.2.3 Level of detail of the CPV

In this section we examine whether the CPV provides an adequate level of detail, or in other words: whether the CPV should be more or less detailed than today.

When using the CPV, buyers and sellers can choose the level of detail at which they want to use the system. The level of detail at which the CPV is actually used was investigated by quantitative analysis of the data and the topic was addressed in the online survey of users. The results are presented below.

2.2.3.1 Quantitative analysis of the level of detail of the CPV used in practice

Level of detail applied by contracting authorities (above EU-thresholds)

We have analysed whether contracting authorities make full use of the detailed structure of the CPV or whether they mostly use only codes at more general levels. The following table shows how often contracting authorities applied codes at the different levels on the basis of the data provided (cf. section 4.1 below for details on the data).

Table 16: Usage of the CPV by level above thresholds

Level	Structure of the CPV (Codes per level)		Usage by contracting authorities above EU-threshold 2009 to 2011	
1 – Division	45	0.5%	179,366	6%
2 – Group	272	3%	437,142	15%
3 – Class	1,002	11%	581,393	19%
4 – Category	2,379	25%	620,358	21%
5 – Subcategory	5,756	61%	1,169,779	39%
Total	**9,454**	**100%**	**2,988,038**	**100%**
Arithmetic Average of Level of Use		**4.4**		**3.7**

It becomes apparent that although only 0.5% of the codes are divisions, 6% of the usage is at division level. On the other hand, even though 61% of the codes are at the lowest level (subcategories), only 39% of the usage is at this level.

The following approach was applied for the purpose of calculating the average level of use of codes,:
- Each code at the level of divisions is allocated the number 1
- Each code at the level of groups is allocated the number 2
- Each code at the level of classes is allocated the number 3
- Each code at the level of categories is allocated the number 4
- Each code at the level of subcategories is allocated the number 5.

An arithmetic average was then calculated for all codes. As shown in the table above, looking at the structure of the CPV the 'average' code is at level 4.4. This means the average code is at a level between a category and a subcategory. Looking at the use of the CPV by contracting authorities when choosing codes for procurement notices, the average use is at level 3.7, i.e. at a level between a class and a category.

This means contracting authorities do not in practice on average make full use of the detailed structure of the CPV. While the structure of the CPV offers detailed codes, contracting authorities on average chose more general codes.

Figure 19 shows the average level of the structure of the CPV and the average use of the CPV by divisions.

The horizontal axis shows the average level of the structure. The vertical axis shows the average level of the usage. This makes clear that in general for those divisions where the structure is

more detailed, the use is also more detailed. There are no divisions where the structure and usage of the structure are very different from the general picture.

The straight red line represents the same values for structure and usage. All but two divisions are above the red line. This is due to the fact that the average level of the usage is below the average level of the structure. There are two exceptions: division 77 (Agricultural, forestry, horticultural, aquacultural and apicultural services) and division 41 (Collected and purified water). Here the average level of use is slightly more detailed than the average level of the structure.

Detailed data per division can be found in Appendix 2.

Figure 19: Level of detail of CPV and its usage by divisions

Usage

For each division weighted average of number of codes used per level

(5 levels:

1. division,

2. group,

3. class,

4. category,

5. subcategory)

Structure

For each division weighted average of number of codes per level
(5 levels: 1. division, 2. group, 3. class, 4. category, 5. subcategory)

$$y = 0.2508x^2 - 1.1155x + 3.6725$$
$$R^2 = 0.6839$$
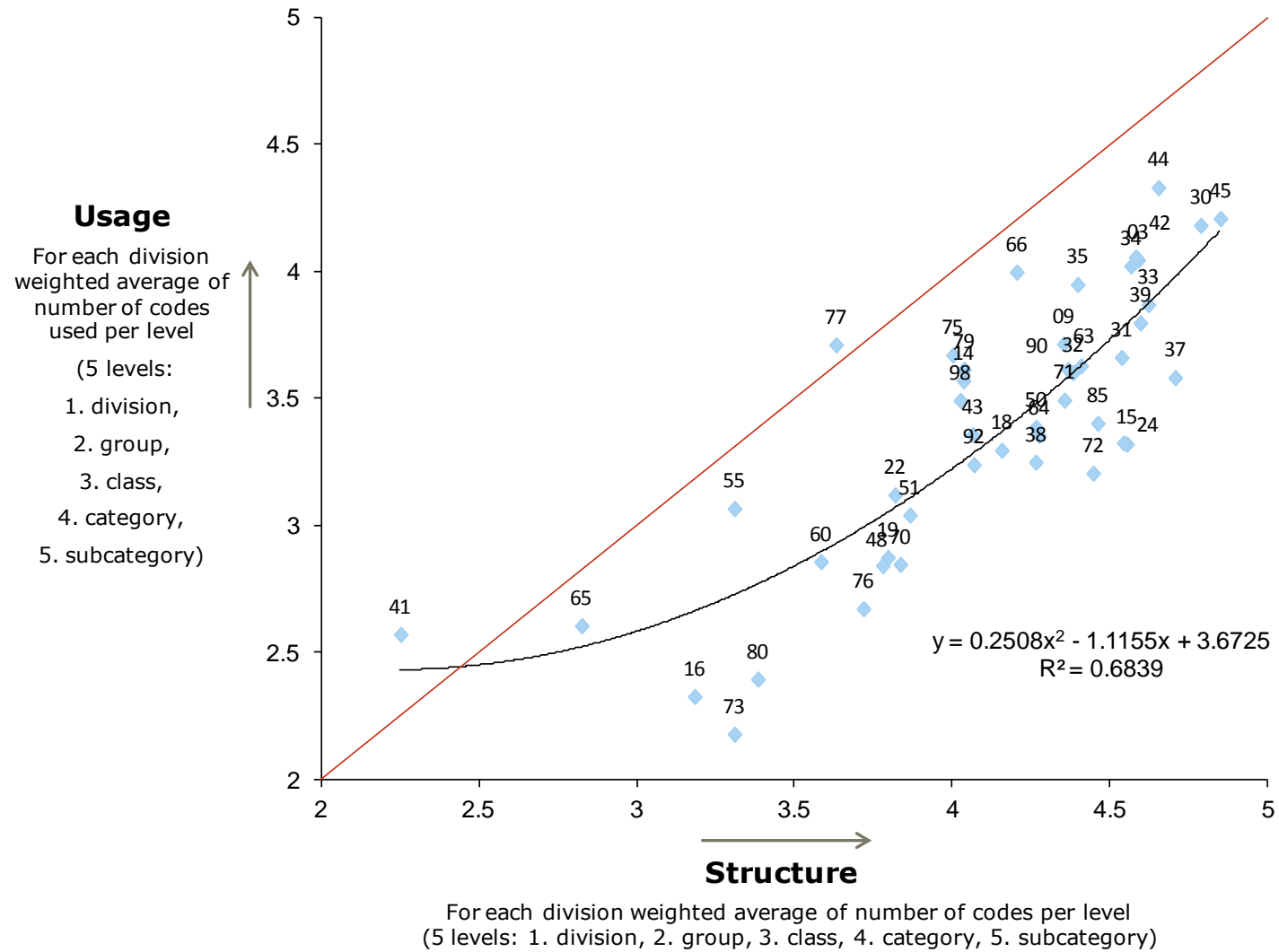
Comparison of the level of detailed applied by contracting authorities and suppliers (above EU-thresholds)

The following table shows the usage by level, comparing contracting authorities above-threshold usage and suppliers. (For details on the data on suppliers' searches see section 2.1.3 above).

Table 17: Usage of the CPV by level – Contracting authorities and suppliers

Level	Structure of the CPV (Codes per level)		Usage by contracting authorities above EU threshold		Usage by suppliers when searching in TED	
1 – Division	45	0.5%	179,366	6%	11,296	31%
2 – Group	272	3%	437,142	15%	4195	12%
3 – Class	1002	11%	581,393	19%	4283	12%
4 – Category	2379	25%	620,358	21%	7140	20%
5 - Subcategory	5756	61%	1,169,779	39%	9008	25%
Total	**9454**	**100%**	**2,988,038**	**100%**	**35,922**	**100%**
Arithmetic Average of Level of Use		**4.4**		**3.7**		**3.0**

Suppliers generally search at a higher level of the hierarchy. They search less often at lower levels. The average level is 3.0, i.e. suppliers use the CPV in an even less detailed way than contracting authorities. This is an indication that the current level of detail of the CPV is actually not needed in practice.

Comparison of the level of detailed applied by contracting authorities above and below EU-thresholds

The following table shows the usage by levels comparing usage above and below the thresholds.

Table 18: Usage of the CPV by level above and below the thresholds

Level	Structure of the CPV (Codes per level)		Usage by contracting authorities above EU-thresholds		Usage by contracting authorities below EU-threshold	
1 - Division	45	0.5%	179,366	6%	9,248	8%
2 - Group	272	3%	437,142	15%	8,572	10%
3 - Class	1,002	11%	581,393	19%	12,119	17%
4 - Category	2,379	25%	620,358	21%	15,073	23%
5 - Subcategory	5,756	61%	1,169,779	39%	26,084	42%
Total	**9,454**	**100%**	**2,988,038**	**100%**	**71,096**	**100%**
Arithmetic Average of Level of Use		**4.4**		**3.7**		**3.6**

The average level of use below-threshold is 3.6. This means below-threshold, the average use is at a slightly higher level than for above-threshold contracting.

Usage of the Supplementary Vocabulary

A so-called supplementary vocabulary exists in addition to the CPV codes, which makes it possible to describe a work/supply/service further. There are, for example, codes for different materials, e.g. "Metal", "Aluminium", " Bronze" etc. These codes can be used in connection with CPV codes and describe the attributes of the works/supplies/services in question. This means a procurement can be described at an even more detailed level.

The supplementary vocabulary consists of 903 codes which are sub-divided in 19 sections and 43 groups.

Unlike CPV codes the application of the supplementary vocabulary is not mandatory. When publishing contract notices, contracting authorities must choose one or more CPV codes but do not need to choose a code in the supplementary vocabulary.

Furthermore the supplementary vocabulary is currently not fully implemented in TED, i.e. one cannot use if for searching. While supplementary vocabulary is shown in notices, it is not possible to search for notices which contain certain supplementary vocabulary.

The supplementary vocabulary is in practice used only very seldom. In total, the supplementary vocabulary was used in only 7,371 of the 495,691 contract notices (1.5% of the notices).[31] From 2009-2011 a supplementary vocabulary was used only 34,933 times. (The details can be found in Appendix 1.) The extent of use (34,933 times in three years) stands in contrast to the 2,988,038 times a CPV code was applied (cf. section 2.1.2 above). This means the supplementary vocabulary is used about 85 times less often than the CPV.

The following table shows the supplementary vocabulary codes most used between 2009 and 2011.

Table 19: Most used supplementary vocabulary 2009-2011

Supplementary Vocabulary		Notices - Main object	Notices - Additional object	Lots - Main object	Lots - Additional object	Total
IA09	Interior	189	101	1,515	279	2,084
IA02	Design and lay	74	18	1,763	9	1,864
SC01	For pension	148	53	1,178	162	1,541
IA11	Modification	148	376	834	49	1,407
AB31	Silk	291	139	466	52	948
HA10	Low cholesterol/fat meal	72	25	586	151	834
TA07	For booklets	89	64	610	27	790
GC24	Whole	93	51	338	170	652
MF09	Using hovercraft	99	137	213	71	520
UB07	Medical products	161	96	132	65	454

By way of comparison, of the 903 codes, 185 codes were not used at all between 2009 and 2011 (cf. Appendix 1).

As the analysis of the sample of tender notices showed, for example, (cf. section 2.2.4), the CPV alone is generally sufficient for describing a tender notice. Furthermore, the application of the supplementary vocabulary is not mandatory in contrast to the CPV. These two factors can explain the very low usage of the supplementary vocabulary. According to expert interviews, attributes of code systems make most sense if these systems are used in e-catalogues. Therefore, attributes make less sense in defining the subject of a tender. This could explain the low usage seen today. If the CPV were used in e-catalogues, the supplementary vocabulary would, therefore, make more sense (see also section 3.2).

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[31] Several supplementary vocabulary items can be applied in one notice. Therefore the number of occurrences of supplementary vocabulary items is higher than the number of notices where the supplementary vocabulary has been used.

2.2.3.2 Qualitative analysis of the level of detail

In the discussion of the codes with practitioners four patterns of possible problem connected to the level of detail of the CPV were identified:
1. Coverage is sometimes too specific;
2. Coverage is sometimes too general;
3. Some codes do not correspond to current market demands;

The patterns are described below.

1. Coverage sometimes too specific

There are codes which are deemed to be at an unnecessarily low level of detail.

For example, the code "Roof works and other special trade construction works" (45260000) has a total of nine different subordinate codes for roofing work: "Roof-tiling work" (45261211), "Roof-slating works" (45261212), "Metal roof-covering work" (45261213), "Bituminous roof-covering work" (45261214) etc. The average user cannot recognise the need for such detailed codes.

Another example: within the procurement of "Tools" (44510000) there are usually whole tool-kits and trimmings to be procured. It is therefore not necessary to encode individual tools, such as "Spanners" (44512500) or "Screwdrivers" (44512800).

A third example: "Precious stone for jewellery" (18511000) is unnecessarily subdivided into "Diamonds" (18511100), "Rubies" (18511200), "Emeralds" (18511300), "Opal stone" (18511400), "Quartz stone" (18511500) and "Tourmaline stone" (18511600).

Codes that describe works, supplies and services in an over-detailed manner are not necessary and could be dropped (see Appendix 3 for codes which could potentially be dropped).

2. Coverage sometimes too general

On the contrary, some works/supplies/services are classified only at too general a level.

Examples for these are: "Coaching services" (79998000) – coaching services for human resources management are different from, for example, coaching services for presentation skills; "Police cars" (34114200) – Police cars can be: police patrol car, observation vehicles, commercial vehicles, busses, special function vehicles e.g. for environmental monitoring, and so on.

Related to this is the situation that certain specific codes are missing even if more general fitting codes are available in the CPV. Examples are:
- Control and communication systems for police and fire brigade control rooms (the alternative higher classification level would be, e.g. "Industry specific software package" (48100000) or "Miscellaneous software package and computer systems" (48900000));
- Exhibition stand construction (the alternative would be "Exhibition stands" (39154100) which, however, as a supply-related code does not imply construction and installation of exhibition stands);
- Provocative agents, e.g. pepper spray for requirements of security agencies (the alternatives would be "Police equipment" (35200000) or "Miscellaneous weapons" (35310000));
- Police dogs (one may use alternatively a higher classification level, e.g. "Police equipment" (35200000)).

The problem resulting from codes that are too general is that public authorities cannot describe their requests to an extent where it would become useful for interested companies.

3. Codes do not correspond to current market demands

The interviews with practitioners also showed that there are question marks over the functionality of certain codes in the light of current market demands. Some tenders are described and coded with terminology that is no longer in use or where, due to technological enhancements, the items are no longer procured or sought after.

Examples are: "Cassette players" (32331200), "Video recorders" (32333100); "Targets for shooting practice" (35210000) – computer-based systems are largely now used instead.

These codes should be modified or deleted (see also Appendix 1).

2.2.3.3 Level of detail of the CPV in the view of its users

In the online survey, the first question connected to the level of detail the CPV provides relates to the number of CPV codes.

Figure 20: Assessment of the number of CPV codes

Overall, how do you assess the number of CPV codes?

	Too many	About right	Not enough
Buyers	42%	29%	29%
Bidders	40%	38%	21%

- ■ There are too many codes, their number should be reduced.
- ■ The number of codes is about right.
- ■ There are not enough codes, more codes should be added.

N = 2624 - 2225
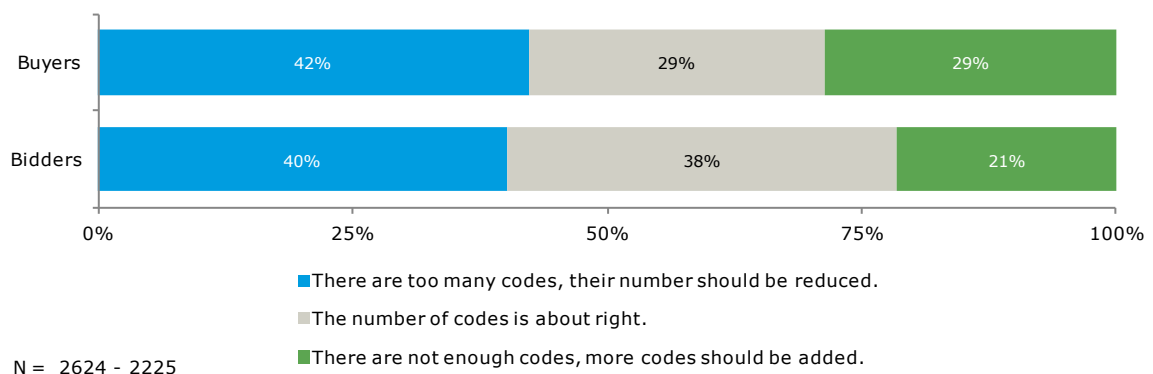
Figure 20 shows that both buyers and bidders are divided on the number of codes. The number of CPV codes is regarded as both too high and too low by a relevant number of respondents.

Bidders assess the number of codes slightly better – just under 40% are content with the number of codes. A possible explanation for the differing opinions – rating the number as too high and too low – might be that in some categories the CPV might be too detailed and in others it is too broad.

Another survey question directly addressed the level of detail applied by buyers and searched for by bidders when using the CPV.

Figure 21: Buyers - Level of detail in using the CPV

Which level of detail do you mostly apply when using the CPV?

| 8% | 10% | 18% | 30% | 34% |

0%   25%   50%   75%   100%

- ■High level code: 2-digit level (divisions)
- ■High level code: 3-digit level (groups)
- ■High level code: 4-digit level (classes)
- ■Low level codes: 5-digit level (categories)
- ■Low level codes: 8-digit level (sub-categories)

N = 2836
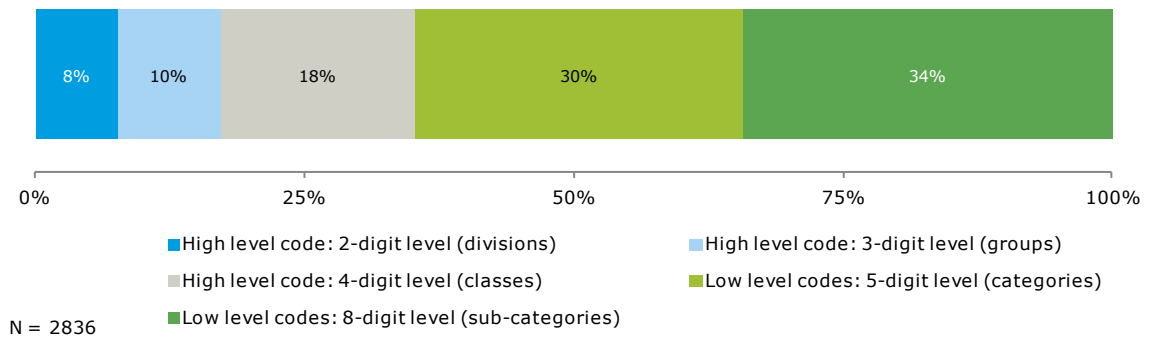
Figure 22: Bidders - Level of detail in using the CPV

Which level of detail do you mostly search for?

| 14% | 14% | 20% | 30% | 22% |

0%   25%   50%   75%   100%

- ■High level code: 2-digit level (divisions)
- ■High level code: 3-digit level (groups)
- ■High level code: 4-digit level (classes)
- ■Low level codes: 5-digit level (categories)
- ■Low level codes: 8-digit level (sub-categories)

N = 1938
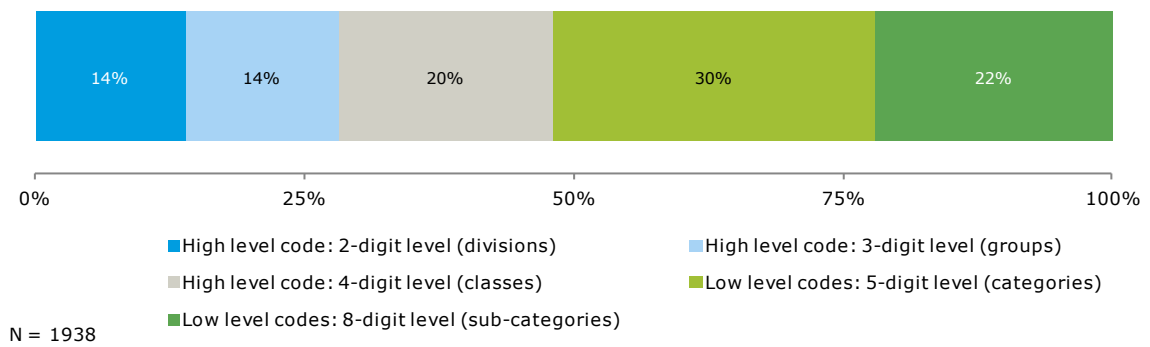
Figure 21 shows that buyers mostly apply more detailed low level codes to describe their tenders. In 36% of cases they apply less detailed high level codes, and therefore apply more detailed low level codes in 64% of cases.

Among bidders we see a slightly different distribution which is more evenly spread across high and low level codes, with more emphasis on the higher level, with a ratio of 48:52 (Figure 22). Thus, bidders search for tenders at less detailed levels than buyers apply when using the CPV.

Based on the responses presented in Figure 21 and Figure 22, both groups were asked to explain their practice.

Figure 23: Buyers - Assessment of high level codes

Usually I apply <u>high</u> level codes... (multiple choice)

...because more specific codes are not available. **49%**

...because applying high-level codes attracts a higher number of bidders. **37%**

...because I do not have the time to identify a more specific code. **27%**

...because of other reasons. **9%**

N = 956
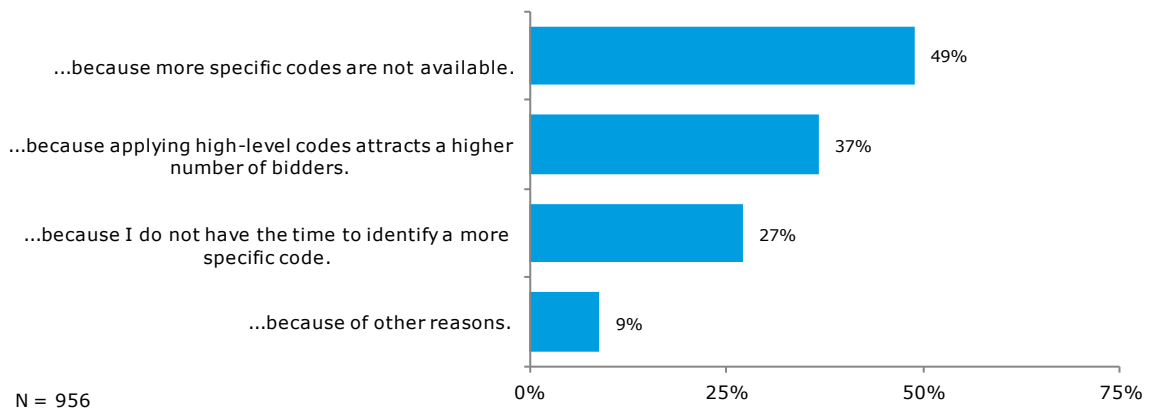
Figure 24: Bidders - Assessment of high level codes

Usually I search for <u>high</u> level codes... (multiple choice)

...because I try to avoid missing relevant contract notices. **73%**

...because I do not have the time to identify a more specific code. **28%**

...because more specific codes are not available. **16%**

...because of other reasons. **5%**

N = 915
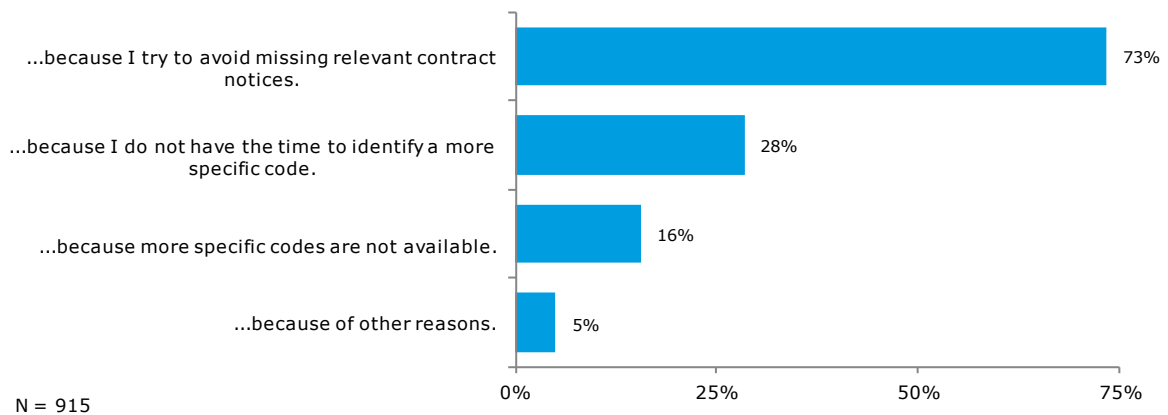
Asked why they apply less detailed high level codes, buyers responded that they do so due to a lack of more specific codes (49%) and to attract a higher number of bidders (37%). Time issues play a role, but not to the same extent (Figure 23). Those respondents who chose "other reasons" explained their preference for high level codes on the grounds of their limited knowledge of the CPV system and the fact that some procurements cover a set of several services or products which can be better described by less specific codes.

The main reason for bidders to prefer high level codes is their wish not to miss relevant contract notices. Of all bidders who prefer high level codes, 73% give this explanation as Figure 24 shows. Frequently mentioned "other reasons" for searching for high level codes are that buyers do not use the system correctly, so that bidders have to search at less detailed higher levels and also that some bidders offer several products.

Figure 25: Buyers - Assessment of low level codes

Usually I apply <u>low</u> level codes… (multiple choice)

...to attract offers that fit the specific procurement. — 64%

...because I know from experience which CPV codes best describe the works/supplies/services I procure. — 37%

...because of other reasons. — 10%

N = 1792
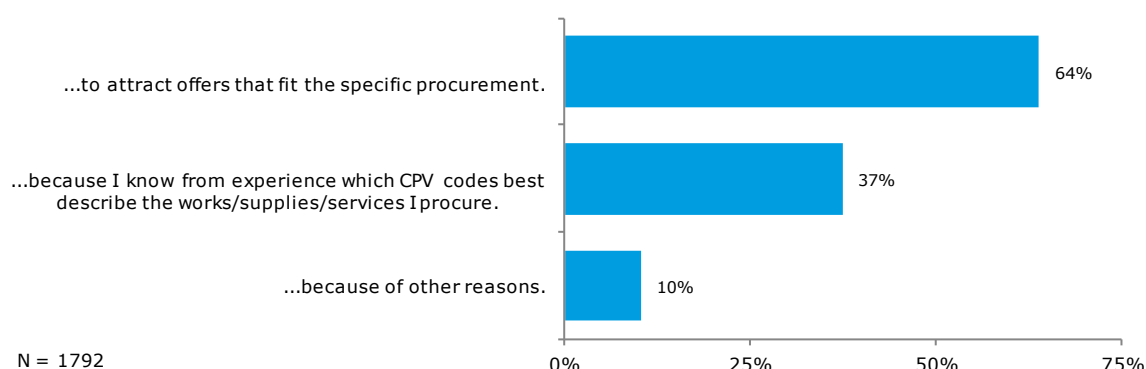
Figure 26: Bidders - Assessment of low level codes by bidders

Usually I search for <u>low</u> level codes… (multiple choice)

…to identify tenders that fit my specific offers. — 40%

...because I know from experience which CPV codes best describe the works/supplies/services I deliver. — 56%

...because of other reasons. — 4%

N = 973
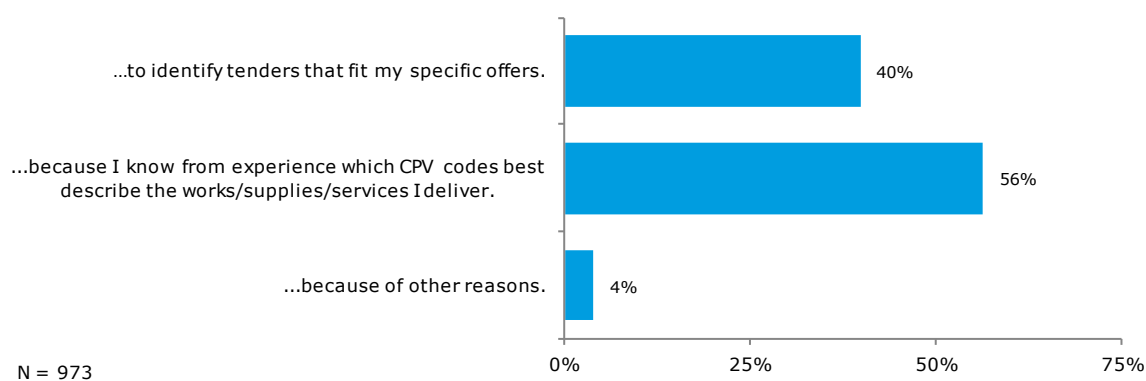
Those buyers who apply more detailed low level codes do so mainly because they are trying to attract offers that fit a specific procurement – 64% give that reason. Another 37% use specific codes because they know from experience which detailed code to apply to describe exactly what they need. As Figure 25 shows another 10% of the respondents give other reasons. Frequently mentioned in this open category is the buyers' assumption that applying low level codes is good practice or that it is mandatory for their institution.

Bidders searching for low level codes mainly do so because they seek to find tenders that fit their specific product portfolio (40%) and because they know from experience which specific codes fits their offerings best.

One of the e-Senders interviewed [32] - Millstream – also commented on the number of codes necessary for providing an effective search tool for bidders. Millstream has since the 1990s provided e-sender services for customers in Scotland, Norway and Ireland. For their collection of publications they have used CPV codes to identify different tender notices from the outset. However, they found that there are some disadvantages to using CPV codes. Therefore, they have developed their own internal coding system to classify contracting notices for their customers. This internal Millstream coding system consists of only 200 codes which, according to the interviewee, are fully sufficient to classify all possible sorts of tenders. Millstream's experience shows that bidders do not have any problems in identifying the tender notices they are particularly interested in – even though the number of codes is much less than the number of CPV codes (9,454 codes). The screenshot below shows an example for Millstream's codes from the area "Works – Construction, Repair and Maintenance".

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[32] See also section 4.4.

Figure 27: Millstream's classification system (Example from the area "Works – Construction, Repair and Maintenance")
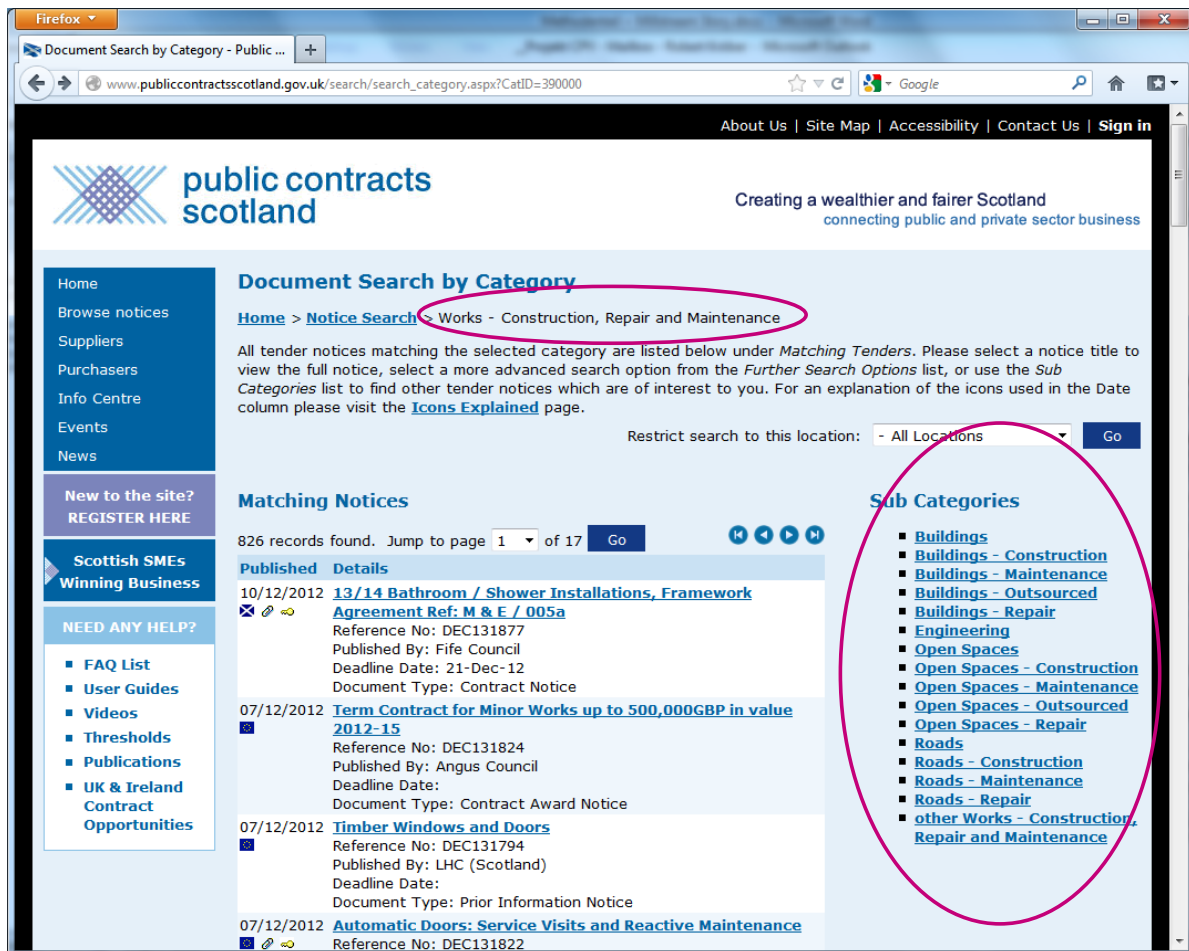
Source: http://www.publiccontractsscotland.gov.uk/search/search_category.aspx?CatID=390000

> **Conclusion:** The level of detail the CPV provides is often not fully utilised or needed in practice by buyers and bidders. This means the number of CPV codes could be reduced. The supplementary vocabulary is used only seldom. It should be considered if it could be deleted. At the same time, a few specific codes are missing which should be added to the CPV.

2.2.4 Extent of correct use

This section examines the question of the extent to which the codes are used in a precise and correct way. It combines findings from an analysis of a sample of tender notices and from the survey.

2.2.4.1 Results from an analysis of tender notices

The extent of correct use of the CPV was investigated by analysing a sample of tender notices. Methodological details on the sampling can be found in section 4.6 below.

For each of the tender notices sampled the following questions were investigated:
1. Does the code used actually <u>not</u> describe the work/supply/service procured?
2. Is the code used too general?

3. Is the code used too specific?

Before outlining the results and examples of the inaccuracy tests, the following examples illustrate accurate usage of the codes:

Example 1: Cleaning services are demanded in the verbal description of the tender notice. The code used is "90911200 Building-cleaning services". It describes the service procured.

Example 2: It might be the case that several codes describe the work/supply/service procured but only one of those codes was chosen. Example: a hospital tenders structural shell works. The code used is "45223220 Structural shell work". This is correct even though there is also a code "45215100 Construction work for buildings relating to health". In this case the structure of the CPV is not mutually exclusive. "Structural shell work" and "Construction work for buildings relating to health" overlap. These cases are considered correct even if only one of the overlapping codes is chosen.

Example 3: Should the main CPV code given alone not describe the works/supplies/services procured completely but the works/supplies/services were described completely when taken together with additional CPV codes given, the case was considered correct. In one example, a tender involved the purchase of a library book vending machine, including delivery, installation and requisite training. The main CPV code "30200000 Computer equipment and supplies" only covers the supplies purchased. However the additional CPV codes (inc. "98000000 Other community, social and personal services"; "72000000 IT services: consulting, software development, Internet and support") address the services included in the tender (even though only at a high level). Thus, the code is marked as correct.

Although in each of these cases the code was marked as correct, a number of patterns regarding the sub-optimal usage of the CPV code were identified:

Pattern 1: Main and Additional CPV codes are at times misused. Thus, the Main CPV Code is sometimes too specific. The more general Additional CPV code used in conjunction should have been employed as the Main CPV code and the Main CPV code should have been used as the Additional CPV Code. For example, in one tender the code "50700000 Repair and maintenance service of building installations" was used as the Main CPV code and "50000000 Repair and maintenance services" as the Additional CPV code. The broad nature of the tender, however, would have warranted switching the usage of the two codes.

Pattern 2: Tenders were identified where the Main CPV code used was correct but the Additional CPV codes used were incorrect. Thus, a tender involving a sewage cleaning service had supplied the additional CPV code "32354600 Video cassettes" as the service involved filming. However, this code refers to a supply. While the code was marked overall as correct, this example is a reflection of a confusion occasionally present in the sample between works, supplies and services tendered.

The results of the tests are presented in the following sections.

1. Does the code used actually <u>not</u> describe the work/supply/service procured?

According to the first test, in 10% of all tenders a code was used that did not accurately describe the work/supply/service procured. High-level and medium-level codes, with 13% each, had higher inaccuracy levels than low-level codes. 14% of all works-contract tenders were inaccurate, more than Supply and Service contract tenders (both 8% inaccurate). The highest inaccuracy level (24%) was identified for codes at the medium level (classes and categories) involving works contracts. Low level codes for procurement of supplies exhibited the lowest inaccuracy rates (2%).

Table 20: Code does <u>not</u> describe the work/supply/service procured

Share of inaccurate tender notices		Type of contract			Weighted average
		Works	Supplies	Services	
Level of the main CPV code	High level (Divisions and groups)	20%	11%	11%	13%
	Medium level (Classes and categories)	24%	13%	7%	13%
	Low level (Sub-categories)	9%	2%	7%	7%
Weighted average		**14%**	**8%**	**8%**	**10%**

The following cases are examples of inaccurate usage:

Example 1: A tender was submitted calling for assistance in financial auditing work. The code used was "79412000 Financial Management Consultancy Services". This code is inaccurate. The correct code is "79212100 Financial Auditing Services". The tender does not involve actual financial management consulting but the auditing of accounts.

Example 2: A tender was submitted with the intention of procuring an "Access Control System". The codes used were "79710000 Security Services" and as an additional CPV "7971600 Identification badge release services". The codes used were inaccurate as the tender involved the procurement of a supply, not a service. Moreover, a specific code for this tender exists: "42961100 Access Control System". The code was thus marked as inaccurate.

Example 3: Lift installation work is demanded in the verbal description. The code used is "45210000 Building construction work". The correct code is "45313100 Lift installation work". The correct code is not a subset of the code used, so the code used is inaccurate.

Within these inaccuracies, a number of patterns were identified:

Pattern 1: A number of inaccuracies were identified for tenders that were not completely identified. Thus, a tender included the code "453200000 Insulation Work", but did not include the code "45353000 Overhaul and Refurbishment Work", which would have described a part of the tender description. The tender was thus marked as inaccurate.

This pattern of incompletely identified tenders occurred in mixed supplies and services tenders in particular. For example, printing and distributing of official news was tendered. The code "22100000 Printed books, brochures and leaflets" was used. However, this code describes only the supply. The distribution service is covered by the code "79824000 Printing and distribution services". Thus the latter code should have been used.

Pattern 2: Tenders may have been mis-specified due to a non-transparent code structure. Thus, in two cases, the code "14400000 Salt and Pure sodium Chloride" was used for road salt. The correct code "34927100 Road Salt" may not have been used due its apparently not correct location in the CPV structure under the category "34927000 Toll Equipment".

It is important to note that this test does <u>not</u> provide conclusions about the appropriate level of code usage. Thus, a code can be assessed as correct, even if it is not very specific. For example, the construction of a road bridge is demanded in the verbal description. The code used is "45000000 Construction work". Even though a more specific code exists, the code used is correct for this text inasmuch as "Construction work" also entails the construction of road bridges. Whether a more specific code exists is investigated in the next test.

2. Is the code used too general?

The second and third tests on specificity were only applied to codes that satisfied the conditions of the first test, i.e. were assessed as accurate.

8% of all codes applied were identified as too general. The inaccuracy level increases from the lowest to the highest level, with no codes by definition being too general at the lowest level. 30% of the tenders with codes used at the highest level (divisions and groups) are considered too general. In service contract tenders, codes that were too general were used 10% of the time, more often than in both works and supplies contract tenders (9% and 5% respectively). Nearly half of all works contract tenders with high level codes (47%) were identified as too general.

Table 21: Code too general

Share of inaccurate tender notices		Type of contract			Weighted average
		Works	Supplies	Services	
Level of the main CPV code	High level (Divisions and groups)	47%	22%	27%	30%
	Medium level (Classes and categories)	9%	2%	4%	5%
	Low level (Sub-categories)	0%	0%	0%	0%
Weighted average		**9%**	**5%**	**10%**	**8%**

We now provide examples for the inaccuracies identified above:

Example 1: Lift installation work is demanded in the verbal description. The code used is "45313000 Lift and escalator installation work". However, the more specific code "45313100 Lift installation work" exists. The code used is correct in terms of the first test. But as a more specific code exists, it is incorrect in the terms of this second test.

Example 2: A tender describes the construction and refurbishment of an "Emergency Department and Day Surgery Unit". The code used was "45000000 Construction work". However, "45215130 Clinic construction work" would, for example, have been a more specific code. Thus the code used was too general.

3. Is the code used too specific?

Codes that are too specific codes were used 4% of the time, and medium level codes involving supplies were identified as too specific 13% of the time.

Table 22: Code too specific

Share of inaccurate tender notices		Type of contract			Weighted average
		Works	Supplies	Services	
Level of the main CPV code	High level (Divisions and groups)	0%	0%	0%	0%
	Medium level (Classes and categories)	4%	13%	0%	5%
	Low level (Sub-categories)	7%	2%	9%	6%
Weighted average		**5%**	**6%**	**2%**	**4%**

Examples of inaccuracies identified:

Example 1: A tender involves the collection and transport of various types of refuse. The codes provided are "90511100 Urban solid refuse collection services" and "90511200 Household refuse

collection services". These codes however do not cover paper collection, which is also mentioned in the tender and is represented by a specific CPV code ("90511400 Paper Collection Services"). Thus the codes used are too specific. The more general code "90511000 Refuse Collection Services" should have been used. Alternatively the code for paper collection could have been mentioned as an additional CPV.

Example 2: Various food items are requested in the verbal description. The code used is "15890000 - Miscellaneous food products and dried goods". However, the code "15000000 - Food, beverages, tobacco and related products" would have been more appropriate. The code used is only a subset of the correct code as it covers only specific food items which are not included in other classes of the CPV. In this case the denomination of the CPV code is misleading. "Miscellaneous food products and dried goods" should read "Food products and dried goods not elsewhere specified".

4. Overall level of inaccuracy (tests 1 to 3 taken together)

In total, an inaccurate usage of codes was identified in 23% of the cases. High level codes and works contracts exhibited the highest degree of inaccuracy (43% and 28% respectively). More specifically, high level CPV codes used in the context of works-contracts were inaccurate 67% of the time, by far the highest percentage. The lowest inaccuracy levels were identified for low level CPV codes for supplies contracts (4%).

Table 23: Tender notices – Overall level of inaccuracy

Share of inaccurate tender notices		Type of contract			Weighted average
		Works	Supplies	Services	
Level of the main CPV code	**High level** (Divisions and groups)	67%	33%	38%	43%
	Medium level (Classes and categories)	38%	29%	11%	23%
	Low level (Sub-categories)	16%	4%	16%	13%
Weighted average		**28%**	**20%**	**20%**	**23%**

The analysis of the sample of tender notices showed that in 23% of the cases the CPV is used inaccurately. Inaccurate use related most often to using codes that do not describe the work/supply/service procured (10%) and to using codes at too general a level (8%). Using codes at too specific a level occurred in only 4% of the cases.[33]

When a high level code (code on division or group level) is used, the code is in 43% of the cases inaccurate. In most of these cases (30% of the 43%) the code is too general, i.e. a more specific code would have been available for the work/supply/service procured.

Comparing works, supplies and services the analysis shows that the highest level of inaccurate usage occurs in works (28%). Inaccurate usage for works relates mostly to using codes which do not describe the work procured (14% of the 28%).[34] We come back to this below.

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[33] The difference between 10% + 8% + 4% = 22% and 23% occurs due to rounding.

[34] We also checked whether this pattern occurred because tenders were incorrectly classified works though they in fact relate to supplies or services. This could happen as the EU-thresholds are higher for works. However, this was not the case in the analysed sample.

2.2.4.2 Extent of correct use in the CPV users' view

In the survey, buyers and bidders were asked whether they can usually identify correct codes.

Figure 28: Buyers - Identification of codes

I can usually identify codes which clearly describe the works/supplies/services.

| 3% | 37% | 28% | 26% | 6% |

0%   25%   50%   75%   100%

■Strongly agree ■Agree ■Neutral ■Disagree ■Strongly disagree

N = 2948
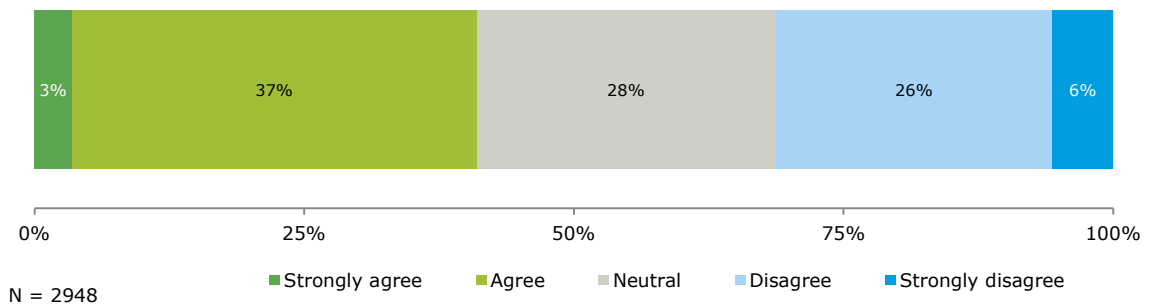
Figure 29: Bidders - Identification of codes

The codes provided in contract notices usually clearly describe the works/supplies/services tendered.

| 3% | 37% | 35% | 21% | 3% |

0%   25%   50%   75%   100%

■Strongly agree ■Agree ■Neutral ■Disagree ■Strongly disagree

N = 2427
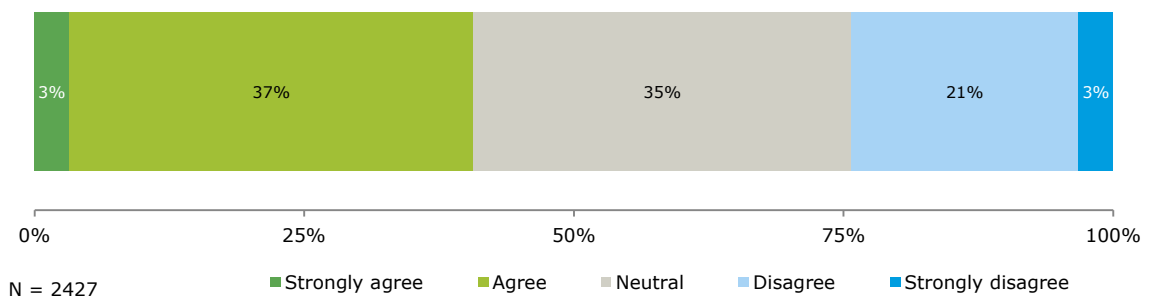
Figure 28 shows that 40% of the buyers surveyed are in their own view able to find codes which fit well with their tenders. One third of the buyers report problems in identifying the right codes.

This view is also confirmed by the bidders' side in Figure 29. 24% say that the codes provided by buyers usually do not clearly describe the works/supplies/services actually tendered.

Bidders frequently stated that wrongly coded tenders are a major drawback when searching for tenders and applying the CPV. In their view contracting authorities either put in incorrect codes or use codes at too high classification levels. This makes using the CPV difficult in the view of bidders. Instead, text search is considered to be more reliable (see also section 2.1.3 above).

2.2.4.3 Possible measures for improving the extent of correct use

The analysis of the sample showed a high rate of incorrect use of the CPV. This was also confirmed by the survey.

Better guidance and search tools might be a measure for supporting the users in finding more specific codes for their tenders (see also section 3.1 below). As the expert interviews and the interviews with eSenders[35] showed some contracting authorities are not fully aware of the value of correctly coded tender notices. The value could be better explained to increase awareness at contracting authorities.

Additionally one might assume that it would be appropriate to force users to choose more specific codes by simply not allowing the usage of codes at division or group level. However, the analysis showed that cases exist where applying a code at division or group level is actually the right choice. This is mostly the case when a tender covers a wide range of different works, supplies or services.

The problem of wrongly coded tenders was reported as being particularly acute for works tenders. Both contracting authorities and bidders criticised the structure of the CPV for works. The structure of the CPV does not match distinctions otherwise used in the construction industry. For example, there is no clear distinction in the CPV between structural engineering (above ground) and civil engineering (underground). There was also criticism that many areas of construction cannot be easily identified within the CPV. Furthermore it became apparent that the structure of the CPV for works is in several instances not mutually exclusive. For examples codes such as "45223220 Structural shell works" and "45215100 Construction work for buildings relating to health" overlap. This might create uncertainties for users as to which code to use and result in use of the wrong codes. We suggest a thorough review of the structure of the CPV for works and a complete revision if necessary.[36]

> **Conclusion:** In 23% of the analysed cases the CPV was incorrectly used. The inaccurate use related mostly to using codes that do not describe the work/supply/service procured (10% of the cases) and using too high level codes (8% of the cases). Too low level codes were used in 4% of the cases. The extent of incorrect use is highest for works (28% of the cases). The incorrect use of the CPV is a relevant drawback of the CPV in the view of bidders. The extent of incorrect use could be reduced by a better CPV structure, particularly in relation to works, better search tools and better guidance.

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[35] Cf. section 4.4

[36] We checked whether the structure of another production classification system could be a good starting point for a restructuring of works in the CPV. This is, however, in our view not the case. We presume that the reason for this is that wide areas of works are mainly relevant for public procurement only but nor for private procurement. This could explain why works are also in other classification systems, which are mainly used for private procurement, not well covered.

2.3   Summary of recommendations in regards to the current CPV

Based on our findings we make the following recommendations in regards to the current CPV:

1. The CPV as a multilingual classification system for public procurement should be preserved. It should, however, be improved.

2. The level of detail of the CPV (i.e. the number of codes) should be reduced generally as it is often not fully utilised or needed in practice by buyers and bidders. The Supplementary Vocabulary should be dropped completely.

3. All elements of the CPV should be reviewed. Codes used only seldom should be dropped and the problems identified in regards to the structure of the CPV solved as far as possible (i.e. code classification levels should be conclusive, codes should match the subject of the superordinate level and codes should be mutually exclusive, cf. Appendix 1).

4. For works, the structure of the CPV should be thoroughly reviewed and completely revised if necessary. It should better match distinctions used otherwise in the industry to reduce the high level of works tender notices with inaccurate codes.

5. While the coverage of the CPV is generally complete, the few missing codes should be added through a defined maintenance process which involves the users (cf. section 3.3 below).

6. Better guidance and better search tools should be provided (cf. section 3.1 below). The guidance should increase public awareness of the CPV and explain in an easy way how to use it to both contracting authorities and bidders. For contracting authorities, it is also important to explain the value of applying the CPV as accurately as possible for bidders and in turn for themselves.

We expect that by implementing these measures the following effects would occur:
- Lower number of inaccurate use of the CPV by contracting authorities
- Higher use rate of the CPV in comparison with other search possibilities (e.g. text search) on the bidders' side.

This would further ease the identification of tendering opportunities for bidders and foster competition in the Single Market.

3.   SCENARIOS FOR IMPROVING THE CPV

This chapter presents scenarios for improving the CPV from an ex-ante perspective. This entails recommendations for better online-tools (section 3.1), the integration of the CPV in an e-procurement environment (section 3.2) and recommendations for the maintenance process (section 3.3). A summary of our recommendations is provided at the end of the chapter in section 3.4.

3.1   Tools for supporting the functioning of the CPV

Complementing the CPV with additional interactive tools can be a way of improving the system's usability and efficiency. In this section, we investigate what supporting possibilities exist and assess them critically in two steps.

In the first step, we analyse which interactive instruments have already been implemented in other classification environments. This entails both desk research and input from experts to provide us with an overview of the supporting tools used in the UNSPSC, GPC and eCl@ss in particular. Based upon these findings we use the results of the online survey to gather information on supporting initiatives from the users' point of view. This is vital to validate the findings of the desk research. Moreover, experience shows that solutions devised in a bottom-up way increase users' compliance and thereby overall efficiency.

In step two we examine the cost-benefit-ratio for the scenario of a stand-alone service and a newly integrated functionality on TED.

In our concluding recommendations we elaborate the classes of instruments that could both improve the functioning of the CPV's usability and are economically reasonable. The assessment of the latter was based on the results of these two steps.

In the following section we examine each of the most important classification systems (CPV, eCl@ss, GPC, UNSPSC) by existing interactive instruments. The survey shows that search functions are the interactive instruments in which users are most interested, as the features of TED/SIMAP are the most frequently used tools for identifying CPV codes (cf. Figure 30). Therefore, we start with an examination of the search functions of the classification systems mentioned above.

The analysis builds on different methodologies: these are mainly the desk research (c.f. section 4.3), input from experts (cf. section 4.4) and the online survey among CPV users (cf. section 4.8).

3.1.1 The tools in use today

In the course of the online survey respondents were asked which tools they currently use for the identification of codes. The result is shown in the following figure and leads us to several general conclusions.

Figure 30: Tools currently used for the identification of codes by user type

Which tools do you currently use for the identification of codes?

N = 615 - 3785

Legend:
- Functionality of SIMAP/TED
- Functionality of own EDP system (Electronic Data Processing system)
- List of codes in Excel-format
- List of codes in PDF-format
- Other (please specify)
- Do not know / not specified
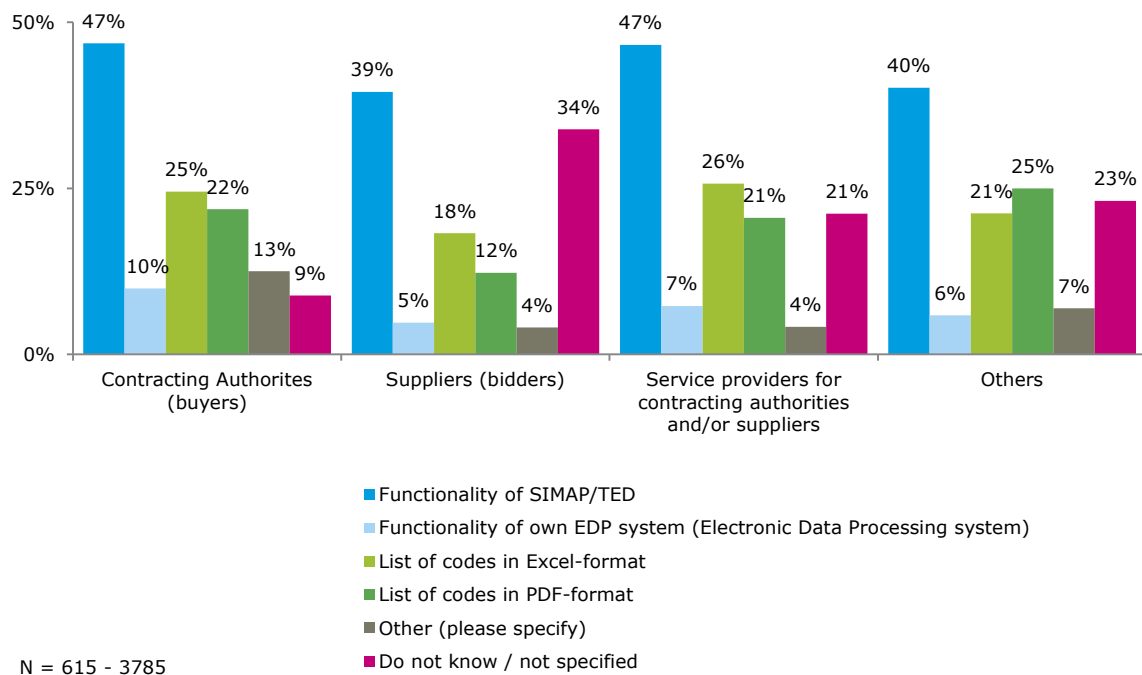
The Figure shows that the features of TED/SIMAP are by far the most frequently used tools for identifying CPV codes – ranging from 39% in the case of suppliers to 47% in the case of contracting authorities.

Lists of codes in Excel and/or PDF format come next, but well behind. One or the other is used by at least a quarter of contracting authorities, service providers and 'others' but by less than one fifth of suppliers.

In-house EDP systems (Electronic Data Processing Systems) are used most (10%) by contracting authorities – the group which overall uses the widest range of tools.

Within the groups of suppliers, service providers and 'others', we observe a high percentage, who do not know what tools they use to identify CPV codes: 34% of the suppliers, 21% of the service providers and 23% of the 'others'. Within the group of contracting authorities, the proportion is only 9%.

There are some consequences for the further analysis. Firstly, the functionality of TED/SIMAP deserves special attention. Additionally, it is evident that there is a very low awareness of the CPV outside the group of contracting authorities. Therefore, it is critical to analyse to what extent this is related to existing tools and this can assist in deriving the requirements for future interactive tools.

3.1.2 CPV Search functions

SIMAP/TED provides different search functions for contracting authorities and for bidders.

1. Search functions for contracting authorities

Contracting authorities use the online tool eNotices[37] on SIMAP for preparing public procurement notices and publishing them in the Supplement to the Official Journal of the European Union.

There are two main possibilities for searching for a suitable CPV Code while logged in to eNotices as a contracting authority. The first option is to browse through CPV's tree structure by clicking for a matching code. The second option is using the text-based search.

Figure 31 shows the layout of the menu for browsing through CPV's tree structure. As part of the search, the user can click through the tree structure of the CPV to look for a suitable code. Double-clicking on a specific code will transfer this code to "Selected items". This procedure can be repeated several times in order to select different codes. By clicking "OK", the code(s) is (are) then copied from "Selected items" into the corresponding eNotices form. In this example, the code selected is "Refined oils".

Figure 31: CPV Search functions: the contracting authority's view – browsing

Source: http://www.simap.europa.eu
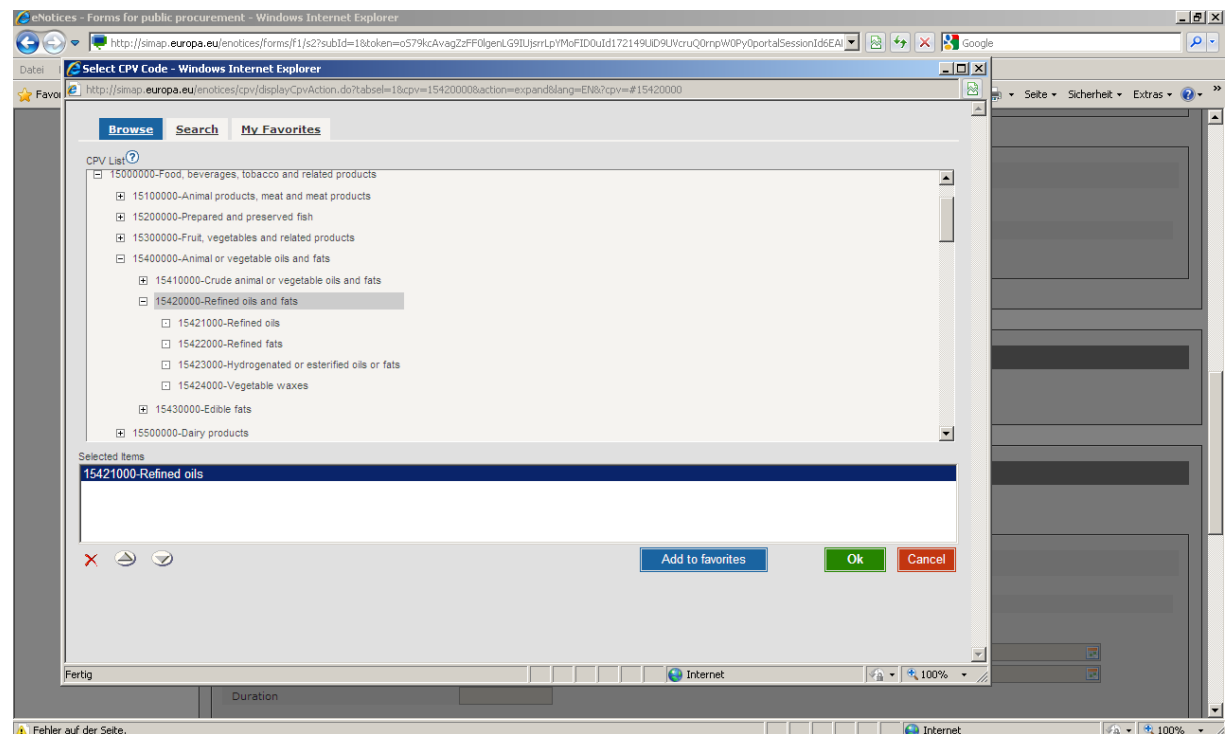
Figure 32 shows the layout of the menu for the text-based search. As part of the text-based search, keywords can be entered and a list of codes appears that match the search term. By double-clicking on a code in the search results window, or by clicking on a code in the search results window and then clicking on the button "Add to list", the code is included in "Selected items". This procedure can be repeated several times in order to select different codes. By clicking Ok, the code(s) is (are) then copied from "Selected items" into the corresponding eNotices form. In the case of this example, entering the search term "oil" brings up all corresponding codes in the list of "Search results".

The CPV-tree structure displayed in the "CPV List" is not automatically updated according to the code selected in the search results window. However, this can be done manually by clicking the "Synchronise with list" button. This expands the "CPV List" to that item.

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[37] http://simap.europa.eu/enotices/changeLanguage.do?language=en

Figure 32: CPV Search functions: the contracting authority's view – searching

Source: http://www.simap.europa.eu
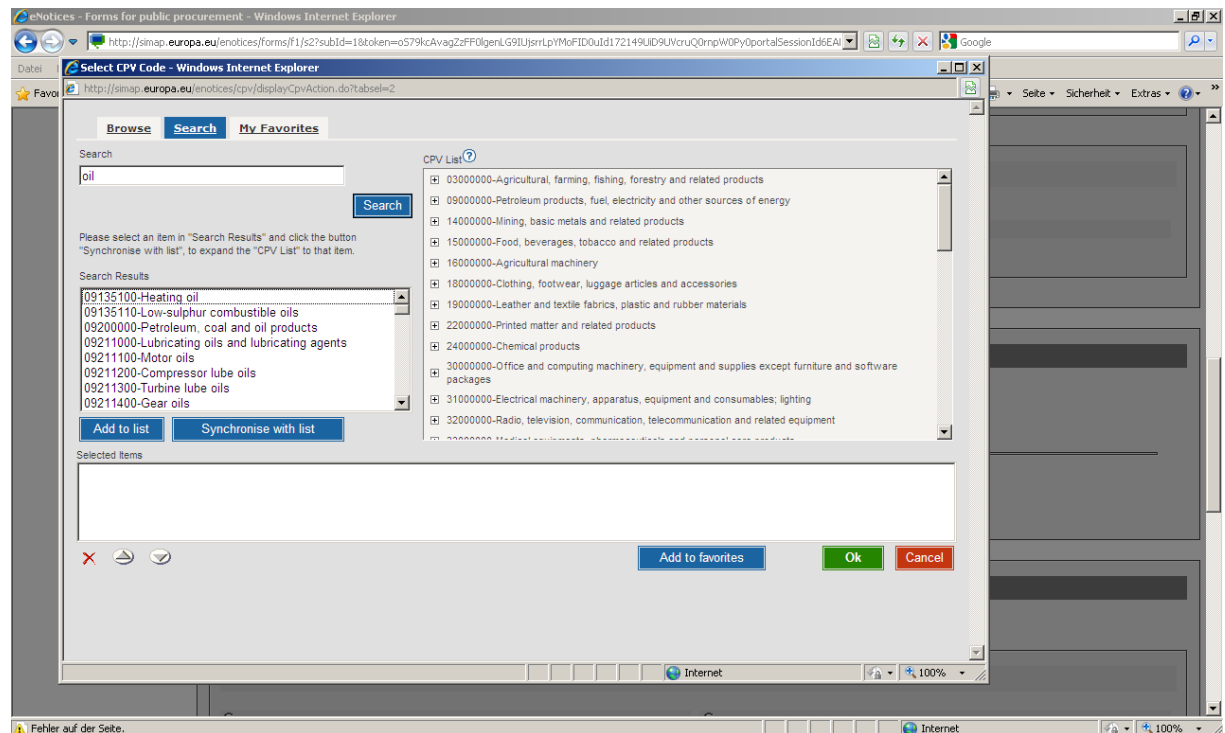
Both search possibilities, browsing through CPV's tree structure and using the text-based search, support the creation of a list of favourites. By clicking on the "Add to favourites" button, a marked code is added to a favourites list and can be reused at a later log-in to eNotices without searching again.

Figure 33 shows the layout of the menu for "My Favourites". From "My Favourites", one or more codes can be transferred via "Selected items" to the corresponding eNotice form. The tree structure of the CPV in the "CPV list" does not synchronise automatically, but only after pressing the button "Synchronise with list". In the example of Figure 33, it can be seen that the code "industrial clothing" has been selected from the favourites but within the "CPV list" – due to a previous search – the "Agricultural machinery" field displays.

Figure 33: CPV search functions: the contracting authority's view – "My Favorites"

Source: http://www.simap.europa.eu
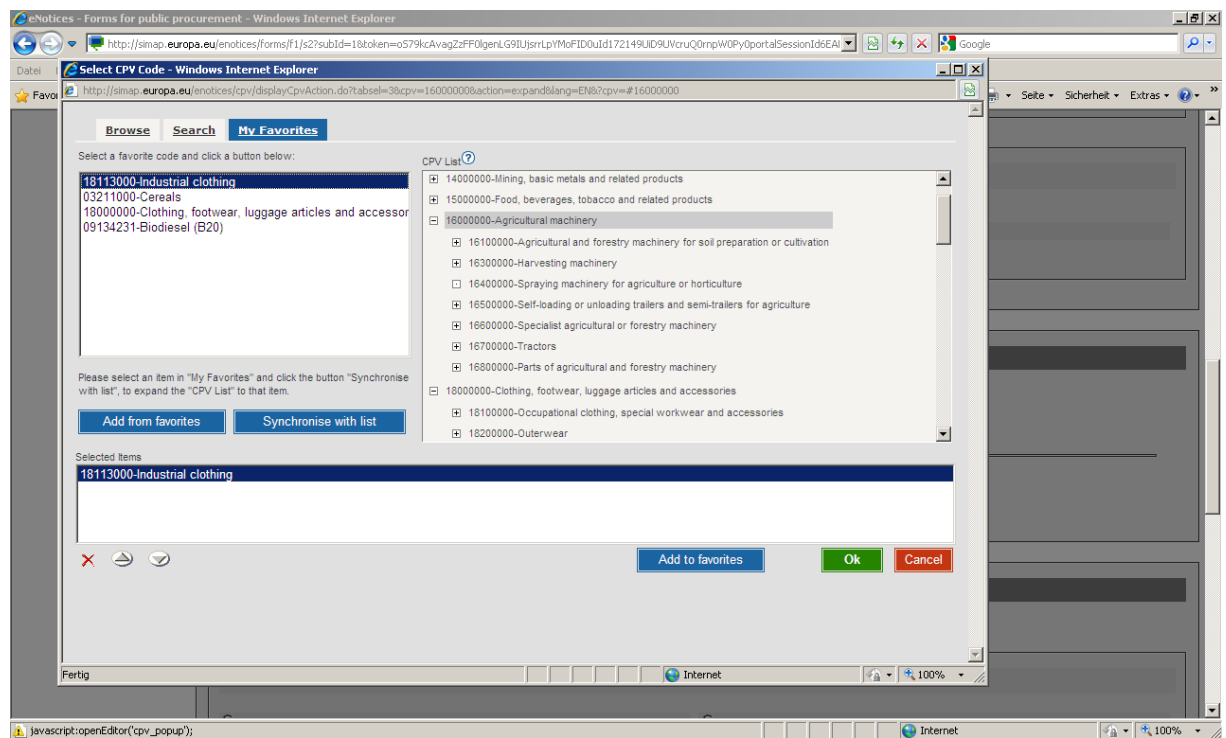
There is no possibility for entering codes directly. The user must use the "My favorites" function, or use either the "browse" or "search" functions.

2. Search functions for bidders

Bidders have the option of using TED to search for CPV codes. TED offers a user interface different from that for the contracting authorities.

Figure 34: CPV search functions: the bidder's view – searching documents

Source: http://ted.europa.eu/TED/browse/browseByBS.do
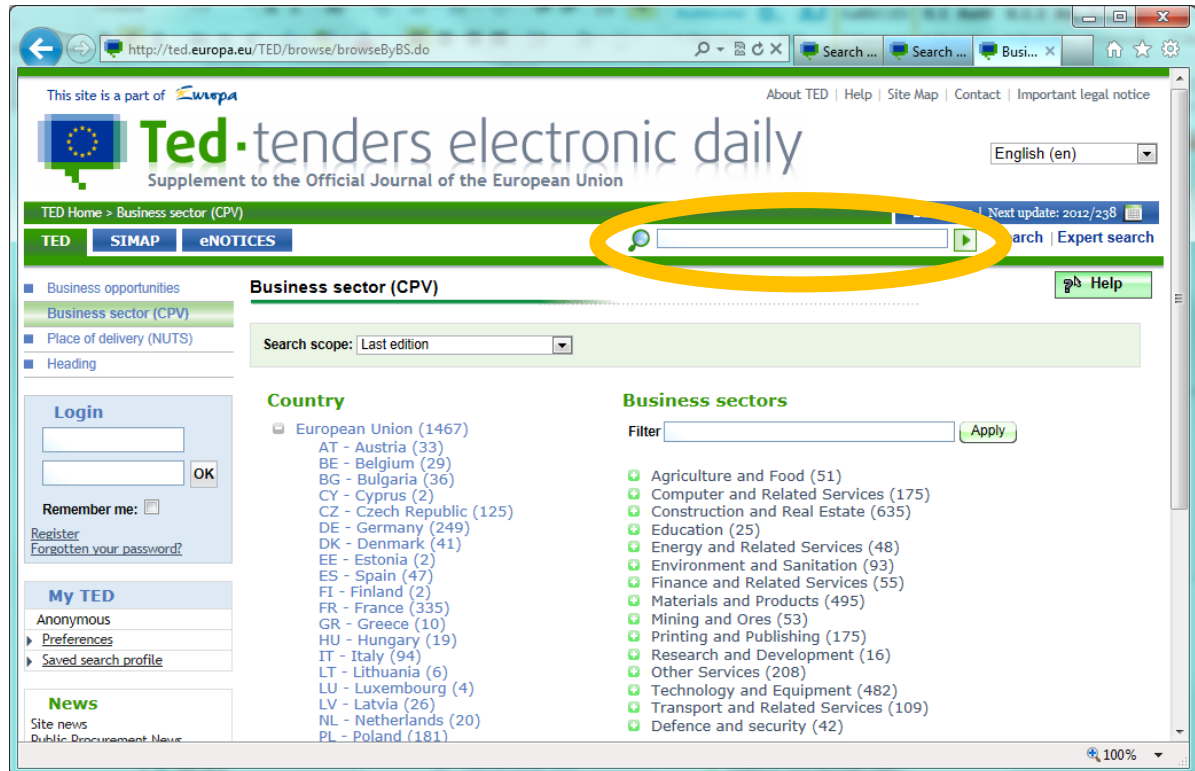
Figure 34 shows the layout of the menu "Business sector (CPV)". Bidders can enter search terms in the "Search" field. When a search term such as "books" is entered, a list appears containing all currently available content on TED in relation to the search term (cf. Figure 35).

Figure 35: CPV search functions: the bidder's view – search result documents, text search
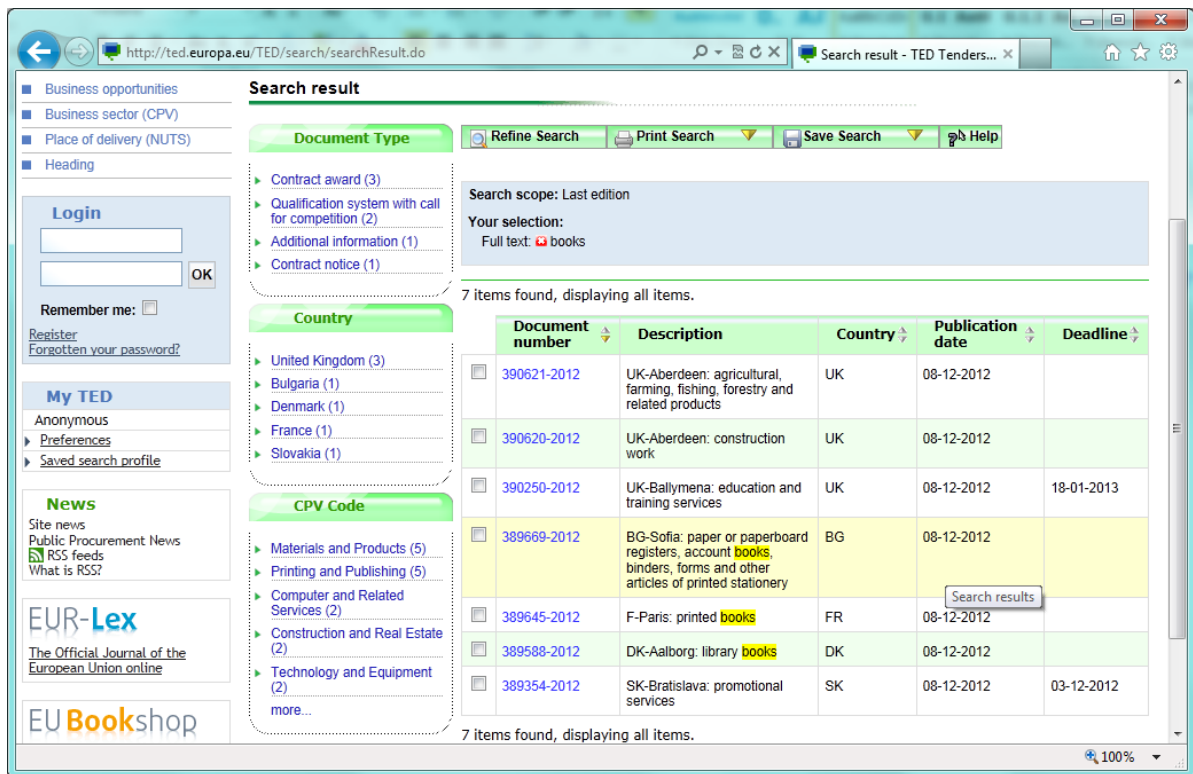
When a CPV code as "22100000" is entered in the "Search filed" (cf. Figure 34), a list appears containing all currently available content on TED in relation to the search term (cf. Figure 36). The list also includes all content in relation to the classes and categories belonging to the group "22100000".

Figure 36: CPV search functions: the bidder's view – search result for documents, CPV Code search
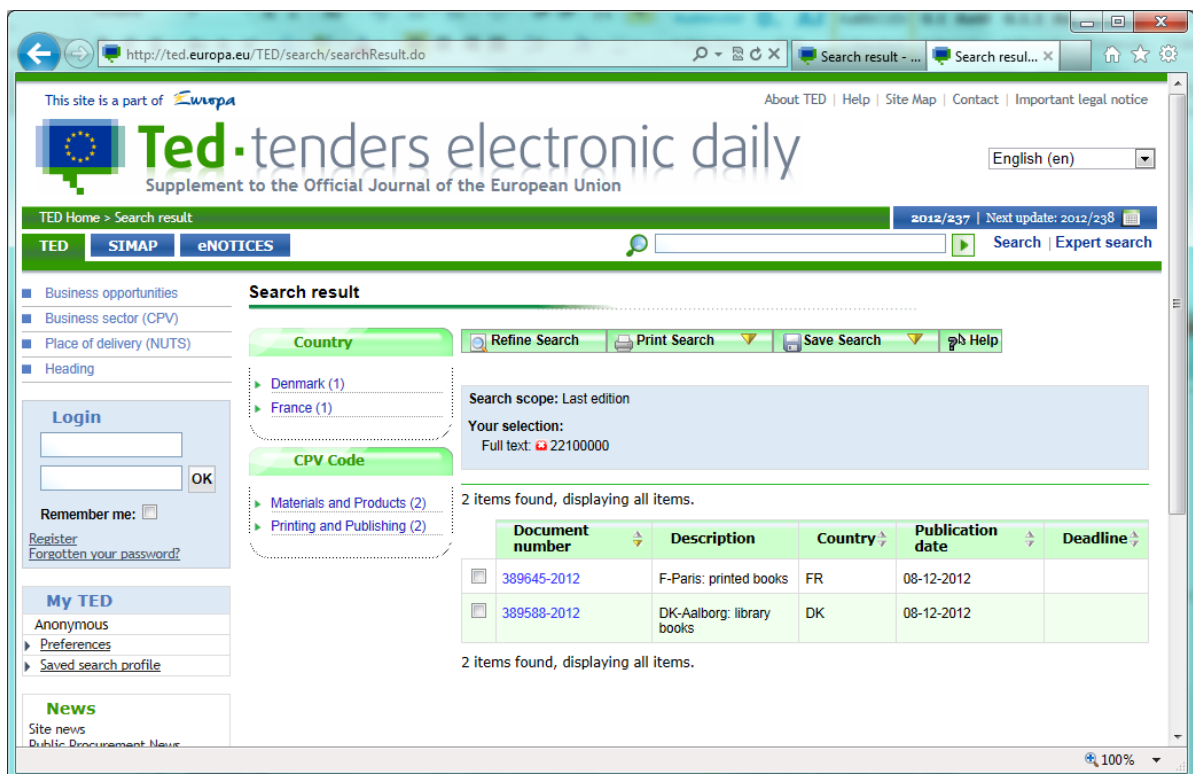
Bidders can also use the "Search" function from the menu "Business sector (CPV)" (cf. Figure 37).

Figure 37: CPV search functions: the bidder's view – search function

Source: *http://ted.europa.eu/TED/browse/browseByBS.do*
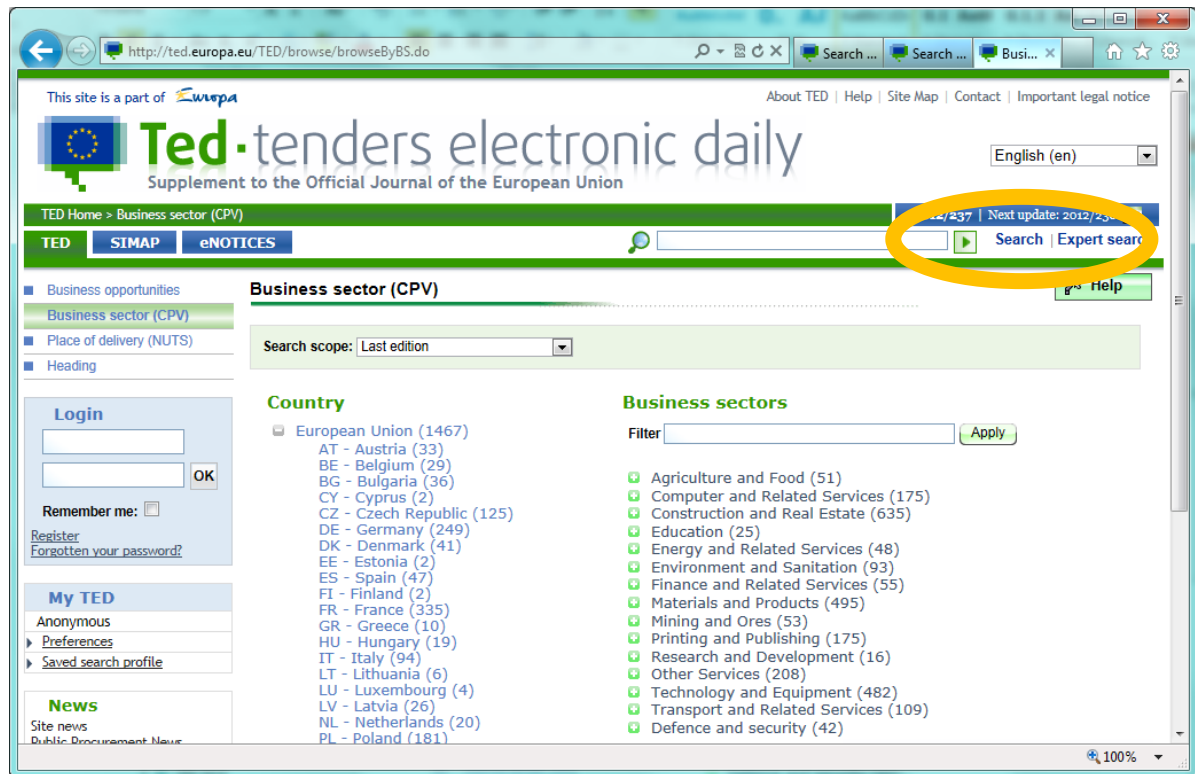
Figure 38 shows the search interface where bidders can search for CPV codes after selecting the button "click to select CPV codes from list".

Figure 38: CPV search functions: the bidder's view – search interface

Source: http://ted.europa.eu/TED/search/search.do
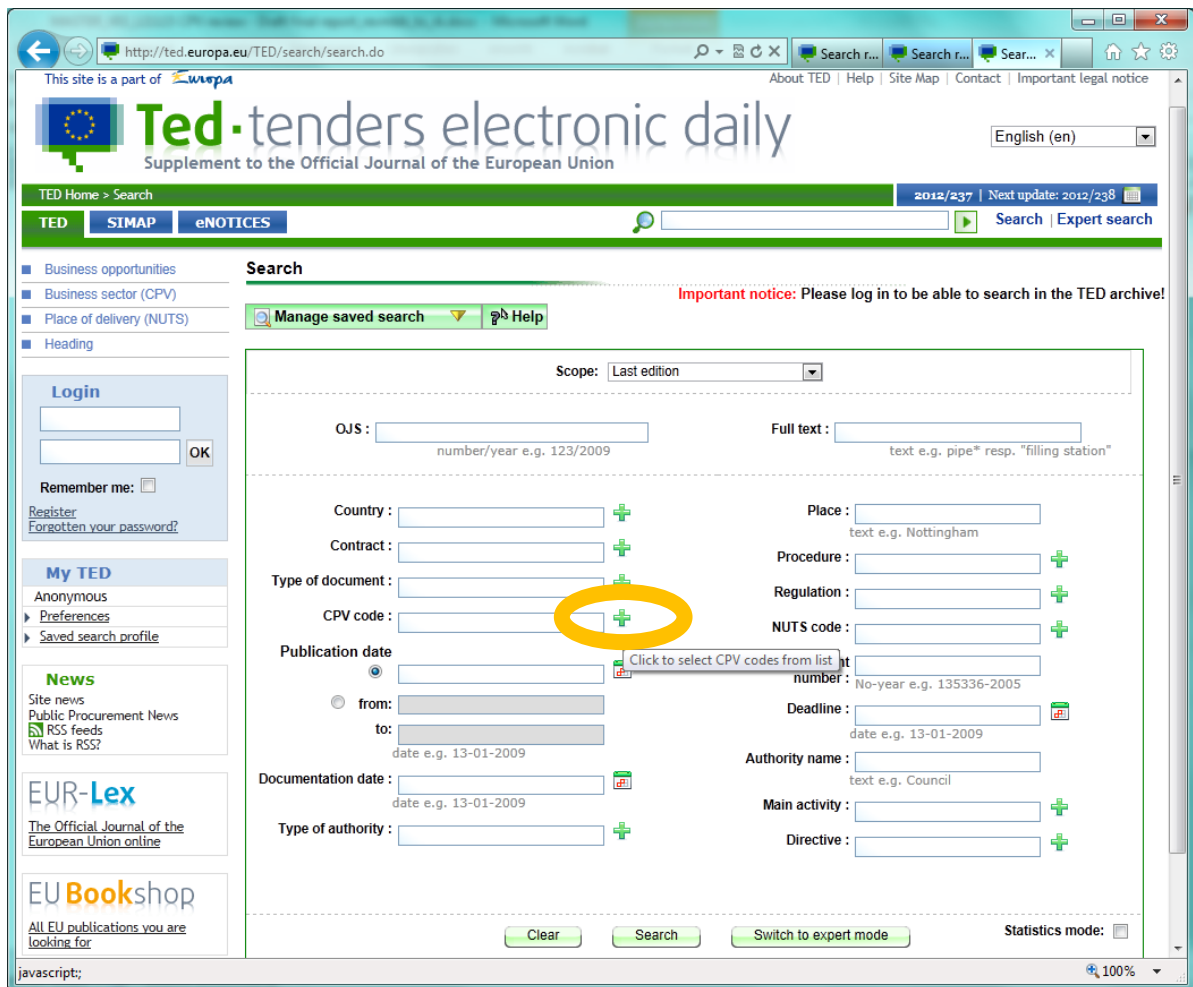
The list displayed in this menu does not contain the CPV divisions, i.e. it does not reflect the official list of CPV codes but is an aggregation of certain divisions to CPV sectors called "Business sectors" (cf. Figure 39).

In the example, it can be seen that the original CPV levels "Agricultural, farming, fishing, forestry and related products", "Food beverages, tobacco and related products" and "Agriculture, forestry, horticultural, aquacultural and apicultural services " emerge under the business sector "Agriculture and food". To bidders this may be confusing, especially when using an original CPV list in Excel or PDF format in parallel. Bidders have the option of browsing by clicking on the CPV tree structure and looking for a relevant CPV code. Then, they can take over a matching code in the TED search interface.

Figure 39: CPV search functions the bidder's view - browsing
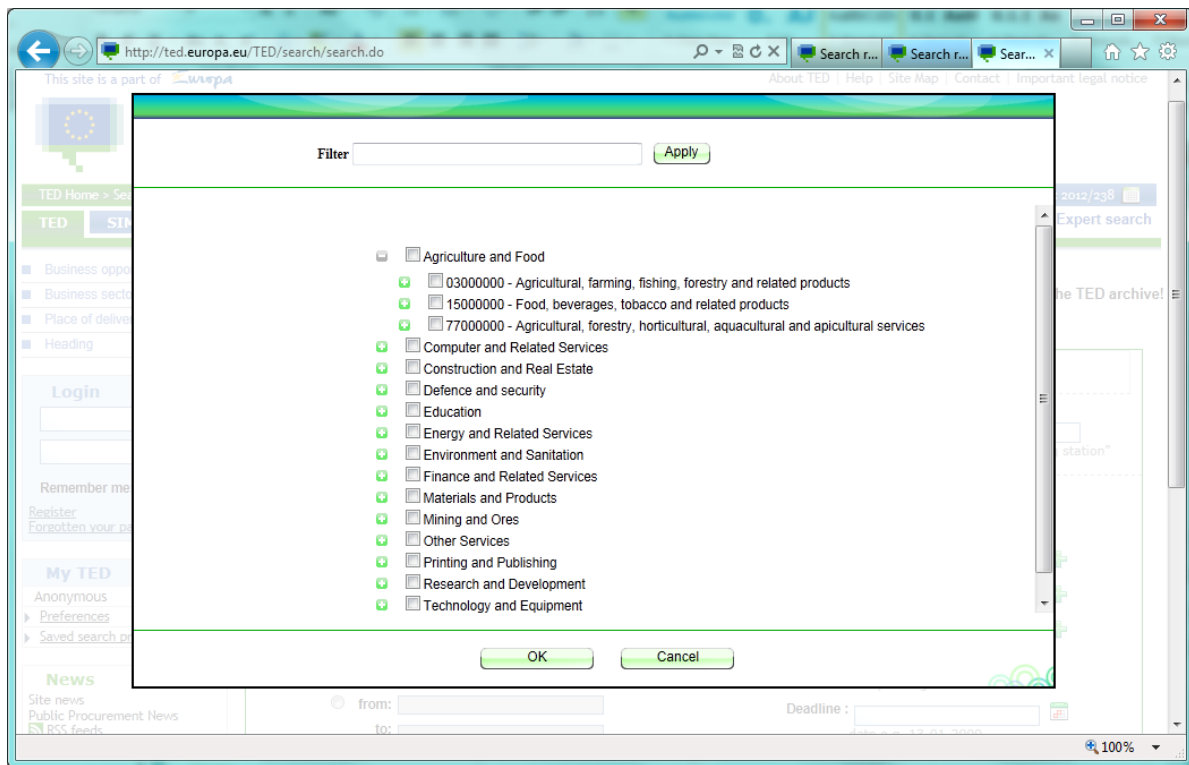
In addition, bidders can enter search terms as illustrated in Figure 40. When a search term such as "books" is entered, a list appears containing all CPV Codes in relation to the search term. However, as mentioned above, the results list is structured by CPV business sector. To get to the content of interest the user can follow the tree of codes. By double-clicking a code, the respective code is transferred to the TED search interface.

Figure 40: CPV search functions: the bidder's view – filtered results list, text search
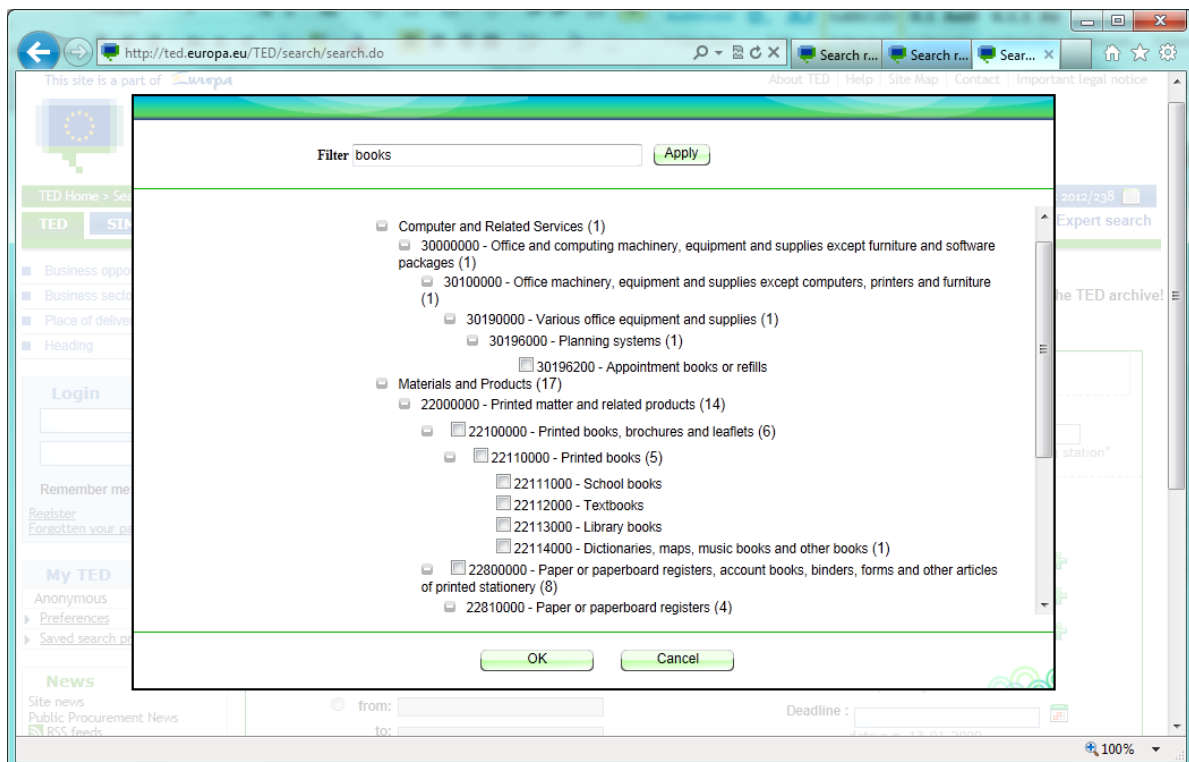
When entering a CPV code instead of a search term such as "books", a list appears containing all business sectors to which the CPV code sought after is dedicated to (cf. Figure 41). In the example, it can be seen that the CPV code "22100000" is dedicated to the business sector "Materials and Products" as well as to the business sector "Printing and Publishing".

Figure 41: CPV search functions: the bidder's view – filtered results list, CPV Code search
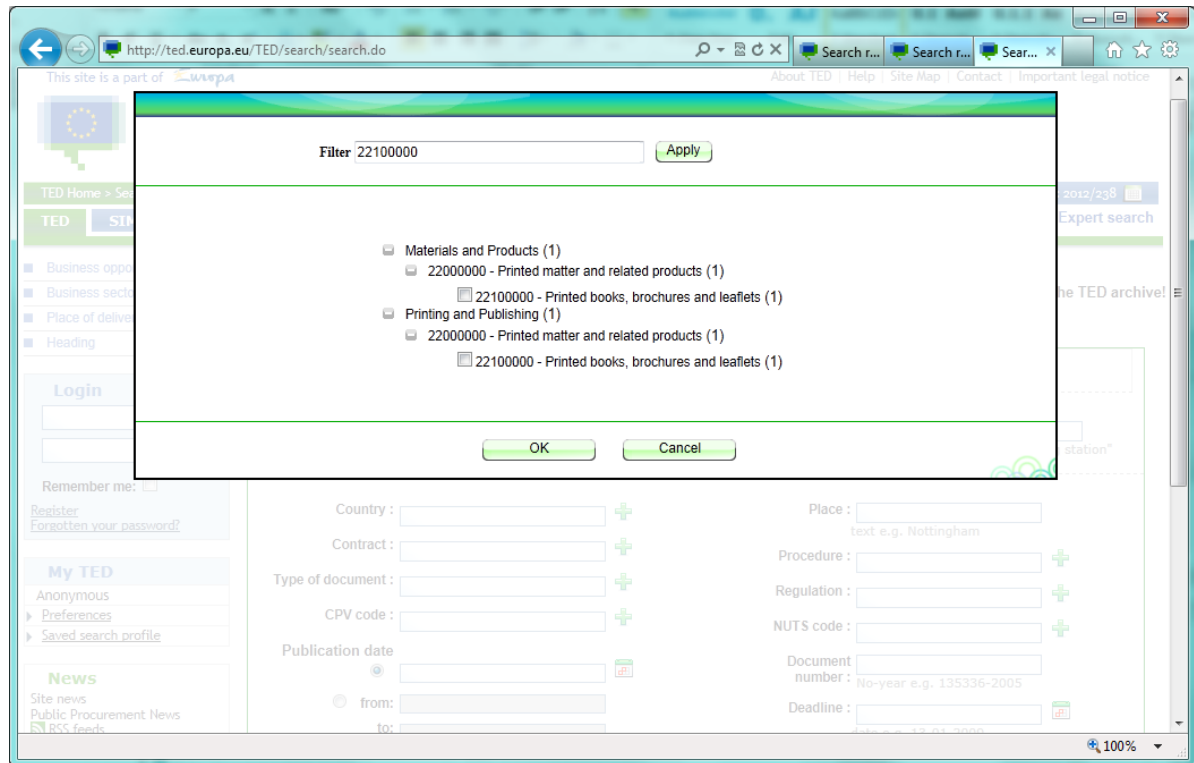
3.1.3 Other classification systems' search functions

The comparison of the search functions of the eCl@ss, GPC and UNSPSC classification systems shows that the search capabilities of UNSPSC are comparable to those of CPV. The search capabilities offered by eCl@ss and GPC go beyond those offered by CPV. Compared with each other, the search capabilities of eCl@ss and GPC are quite similar.

The search functions of the three classification systems are described below.

eCl@ss supports two options for searching for codes: a simplified search and an advanced search. Standard search allows for searching by browsing the tree structure and a text-based search providing the options of differentiating between classification, property and value. Advanced search is much more detailed in terms of text-based search options. It is possible to select a text-search function within the following categories: classification class and keyword, application class, block, property, value, value list, unit, keyword, synonym, aspect and aspect type (cf. the screenshot below).

A wildcard search/search with operators is possible. Whilst searching in "classification classes + keywords", search results are divided into three categories: "classes", "keywords", "classes with keywords". The screenshot below is an example for the search by keyword. By clicking on a code in the search results list, the eCl@ss tree synchronises (on the screen in the left half screen) and more information is provided about that specific keyword search.

Figure 42: Search functions of eCl@ss: advanced search

Source: http://www.eclass-cdp.com/portal/selectNode.seam
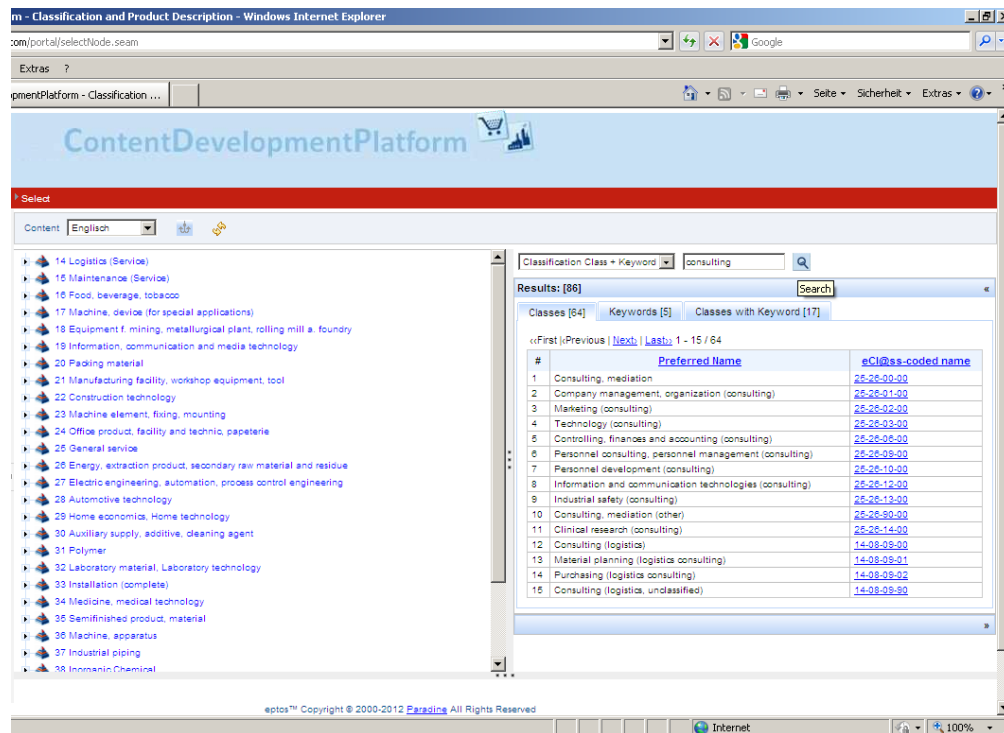
GPC: There are two different ways of searching GPC: The first option is browsing the code's tree structure. The second is using text-search with different options for focusing the search at segment, family or class level and differentiating between 'brick or attribute' or 'brick and attribute'.

As the following figure shows, the search result presentation on GPC is quite similar to that of eCl@ss: the matching codes are displayed based on text-based search terms. Similar to eCl@ss, the search can be narrowed by not including all aspects of GPC codes in the search, but for example searching at class level only.

Figure 43: Search functions of GPC: list of results

Source: http://www.gs1.org/1/productssolutions/gdsn/gpc/browser/index.html
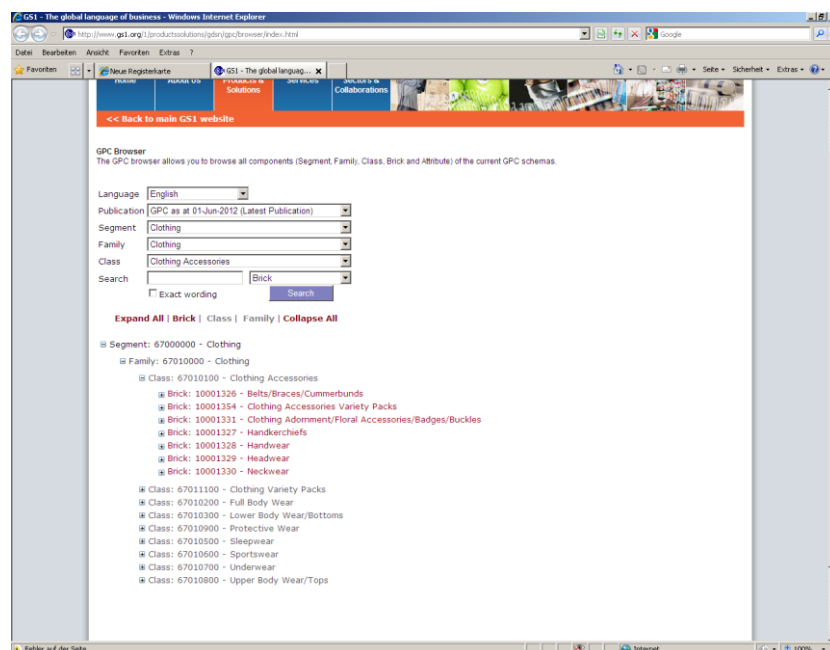
UNSPSC: UNSPSC can be searched directly via codes or via search titles. Both approaches lead to a list of matching codes as shown in the following screenshot. There is no option at all to browse the tree structure.

Figure 44: Search functions of UNSPSC: list of results

Source: http://www.unspsc.org
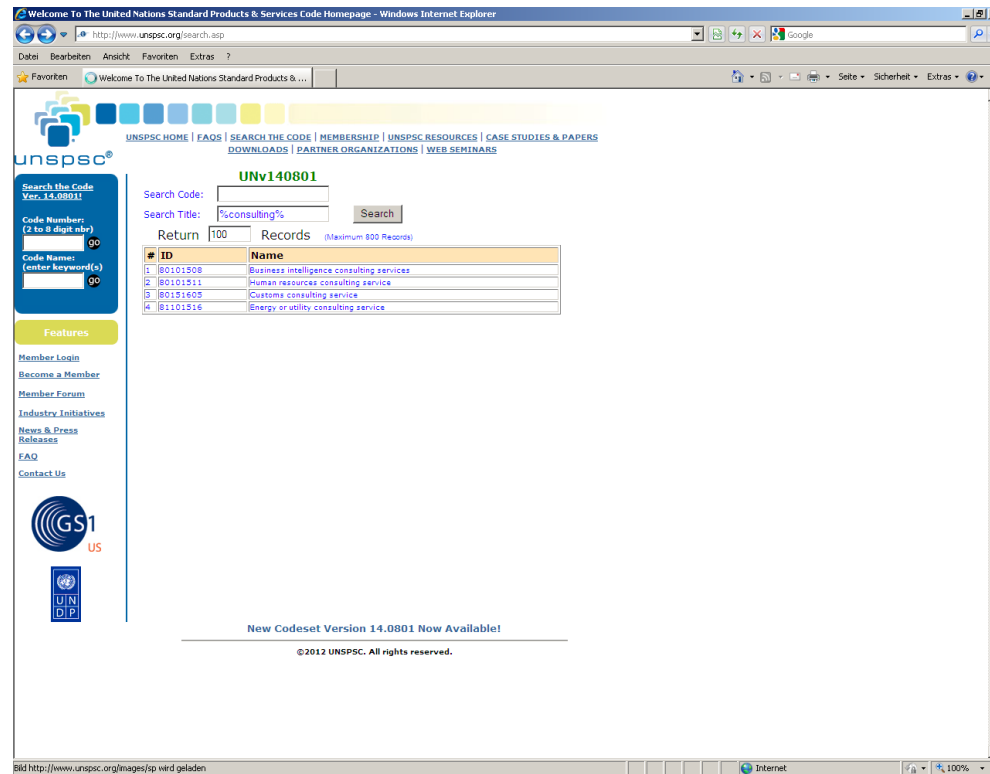
3.1.4 Other search functions – examples

There are already websites which are not part of TED and SIMAP and are not run by the European Commission which offer advanced search facilities for CPV code searches. In this section, three representative examples are presented, all of which give users the opportunity of searching for CPV codes on the Internet.

Example 1: The following figure shows the British website "bipsolutions" which offers a keyword search for identifying CPV codes. In this search, the user can enter search terms. While the terms are being entered, the system offers suggestions for appropriate codes. In the example, we entered the combination affix "con" which leads to 871 CPV codes suiting the search item, such as the codes for "coconuts" or "coniferous wood". If the search item is expanded to a longer word complex such as "consulting" the number of proposed CPV codes drops to four (containing two divisions) of which all have some bearing on "consulting". By double-clicking a code in the search list the relevant code is displayed within the tree structure of the CPV, allowing the user to browse.

This enables the user to find relevant CPV codes without the need to deal with the logical structure of the CPV. Whilst a selected code also appears in the tree structure of the CPV, the user can spot adjacent CPV areas. This enables the user possibly to find a more appropriate code while repeated use of the search function helps in gaining a better overview of the general structure of the CPV.

Figure 45: CPV Code search – example from website "www.bipsolutions.com"

Source: http://www.bipsolutions.com/cpvtool/bip-cpv-search-tool.html
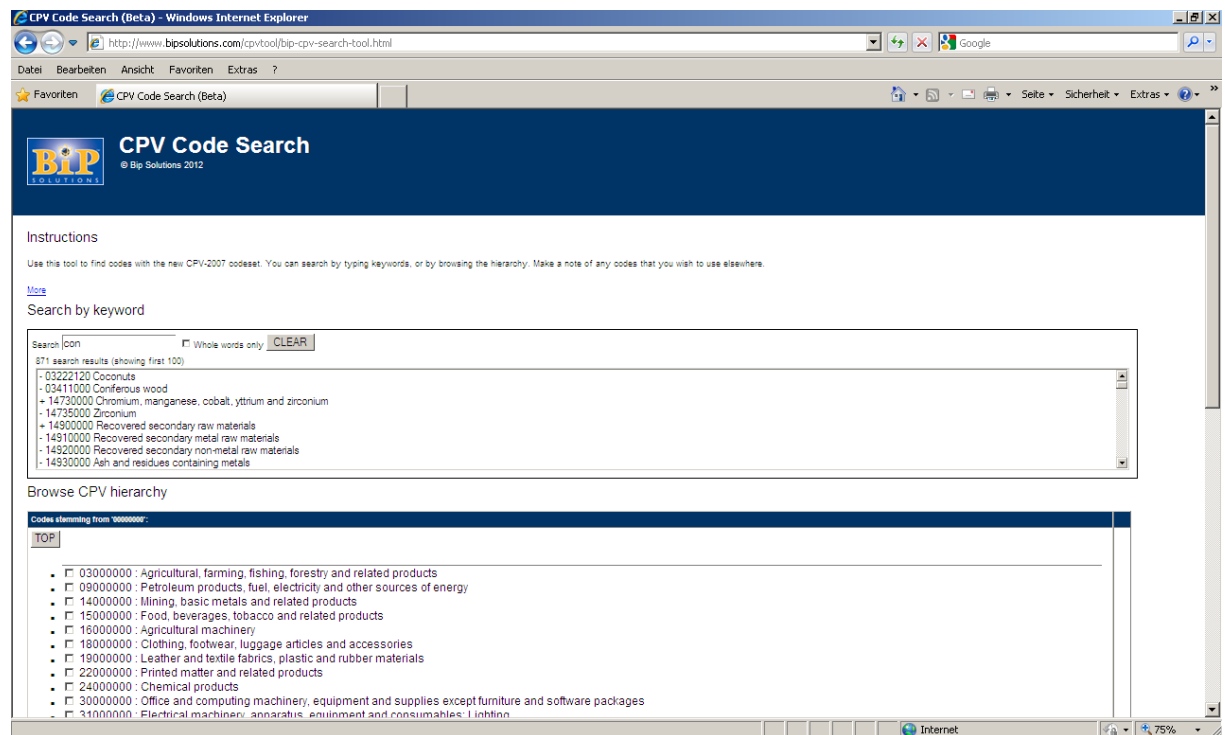
Example 2: The British website "contractsfinder.businesslink.gov.uk" offers an interactive software tool proposing CPV codes on the basis of the descriptions entered. The screenshot below illustrates this function. In this example, the software tool proposes all possible CPV codes that are linked to the search phrase "car".

Figure 46: Screenshot of interactive software tool from website "contractsfinder.businesslink.gov.uk"
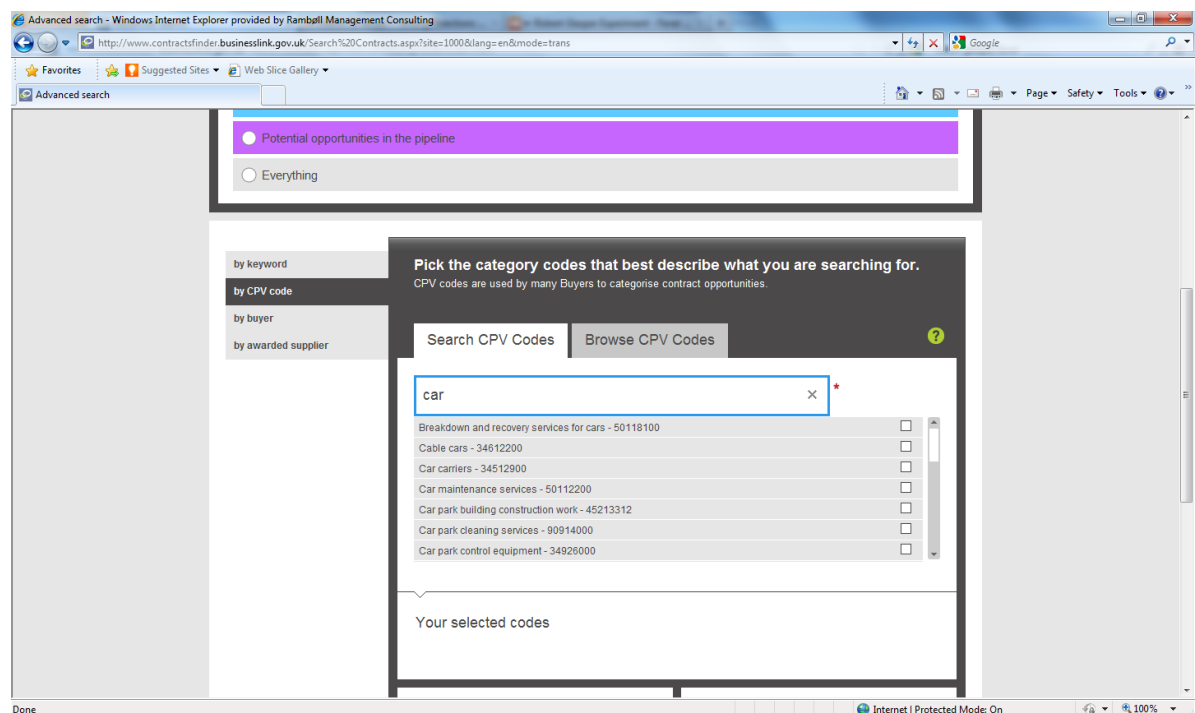
Source: http://www.contractsfinder.businesslink.gov.uk/Search%20Contracts.aspx?site=1000&lang=en[38]

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[38] Choose "by CPV codes" and "Search CPV codes".

Example 3: The Dutch website "europadecentraal" also offers the ability to search for keywords. This opens a pop-up window in which all codes corresponding to the search term are listed. In the example shown below, the search keyword is "water". The screenshot shows the result, which opens in a separate window. By scrolling, the user can move through the list. There is also an option of clicking on one of the CPV codes listed in the search results list to see displayed in which position the respective code is classified in the CPV tree structure. In addition, the user can see the code translations in another ten official EU languages.

Figure 47: CPV Code search – example from website "www.europadecentraal.nl"
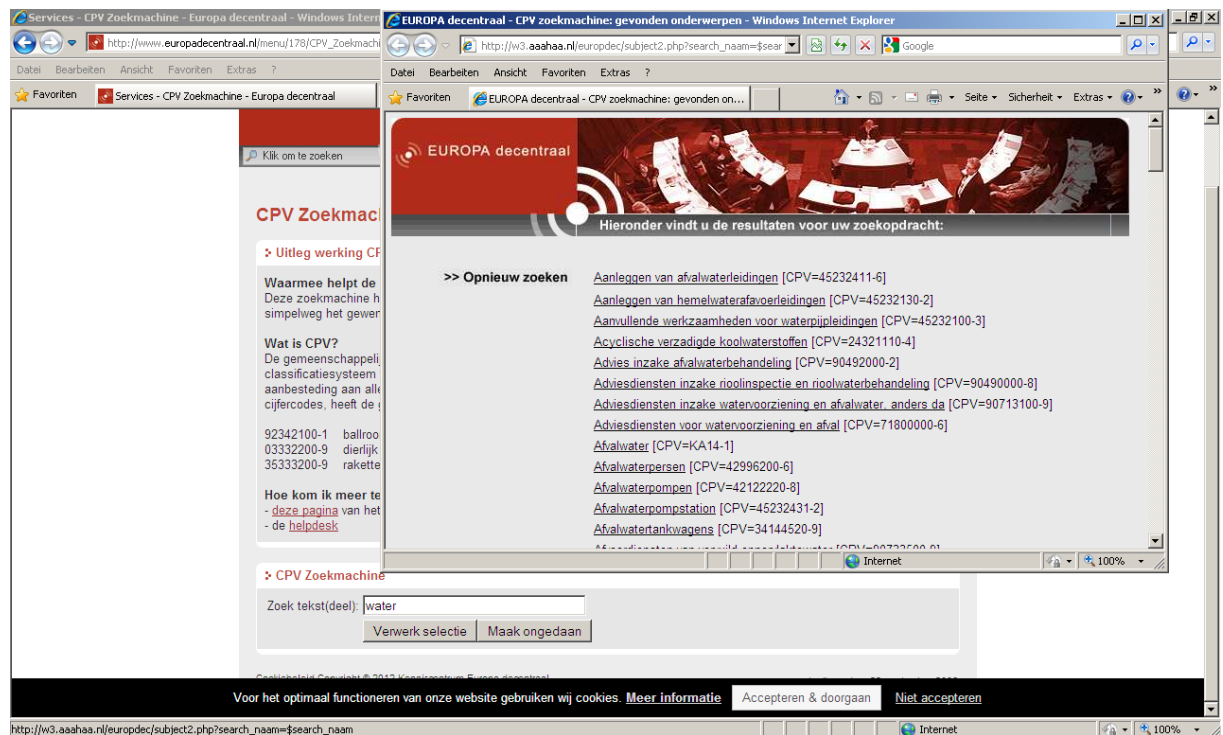
Source: http://www.europadecentraal.nl/menu/178/CPV_Zoekmachine.html

3.1.5 Summary of comparison and evaluation

The opportunities offered by search functions have a significant impact on the usability as perceived by the user. In the case of the scope of the CPV, this applies to users in the public sector (contracting authorities) as well as to users from the private sector (companies interested in public procurement and bidders).

The analysis above threw up two fundamental aspects:

First, unlike the eCl@ss, GPC and UNSPSC classification systems, the CPV distinguishes between the roles of contracting authority and supplier in terms of the search functions available, providing them with a different access route to the CPV and making different search available to each group of users. In the other classification systems, there is a single user interface that comes with all search functions which are used by all users equally.

Contracting authorities come into contact with the CPV in the context of SIMAP, using the standard forms to be filled out for notices. Here contracting authorities are restricted to the search capabilities described previously.

Companies interested in public tenders and bidders come into contact with the CPV within the search on TED by CPV codes. As shown above, there is an assumption of considerable prior knowledge of the functioning and the structure of the CPV on the part of the companies. The

structure of the search capabilities offered to enterprises complicates rather than simplifies the use of the CPV.

Second, unlike eCl@ss and GPC, the CPV codes have no attributes and no keywords or synonyms. In the present state of development of the CPV, it would not be possible to build in search functions for these items in the way these two classification systems do.

Nevertheless, there are improvements to the search capabilities in the use of the CPV which would be feasible, e.g.:

- A web-based search engine available equally to contracting authorities and bidders: this should be available to contracting authorities without being logged in to the online eNotices tool and should also be available to interested companies. The web-based search engine should provide searching capability by browsing the tree structure and a text-based search. The search engine should display search results automatically when entering search terms in order to increase search comfort (cf. example 1 above). The majority of users are accustomed to this feature from their experience with Internet search engines.
- Contracting authorities should be able to enter CPV codes directly within the SIMAP forms without first having to select from the pop-up menu "Browse", "Search" or "My favourites".
- Facilitating the search for keywords and synonyms: at present, the text-based search hits matching codes only when the search term directly corresponds to a specific CPV code or the designation of a portion of the code. Keywords (and synonyms) could be added to the CPV in order to implement the keyword search in the next step.
- An option to limit search areas within the CPV would reduce the complexity of the hit list. For example, the text-based search for the word "oil" would then be limited to the division or group level. Or when specifically looking for detailed codes, the search could be limited to the subcategory level.
- Self-learning like Google: TED could facilitate the search for users by re-directing wrong or incomplete search inquires to the correct items. In the end, the system could learn from the user inquiries. These search functions could propose possible search items to users while typing (see Google).

The points above focus on technical improvements to CPV search functions. In addition, there is also potential for improvements in content quality, e.g:

- A detailed explanation of works, supplies and services described by a certain code. Examples of concrete works, supplies and services are helpful to understand the codes. GPC for example uses definitions at the brick level to help users get a better understanding of the codes (cf. Figure 48) and eCl@ss has started to provide pictures for several commodity classes (cf. Figure 49).
- A possibility for viewing actual and past tenders which have used a particular CPV code. Contracting authorities may use actual and past tenders to decide whether they selected a suitable CPV code for their tender or not. In addition, it would be conceivable that bidders evaluate tenders for the correct usage of CPV codes. The functioning would be similar to online reviews of hotels, e.g. holidaycheck, tripadvisor or others.

Figure 48: Search functions of GPC: definitions on brick level

Source: http://www.gs1.org/1/productssolutions/gdsn/gpc/browser/index.html
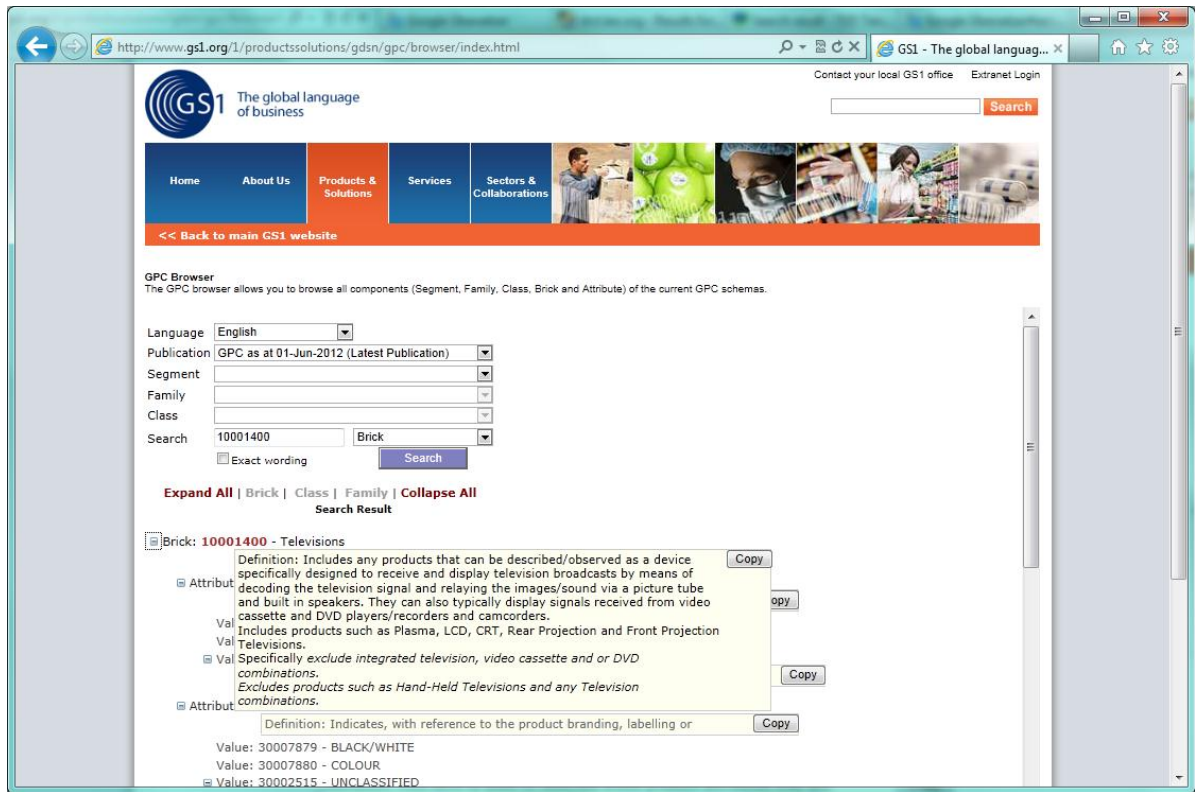
Figure 49: Search functions of eCl@ss: providing pictures

Source: http://www.eclasscontent.com/index.php?id=27130802&version=8_0&language=en&action=det
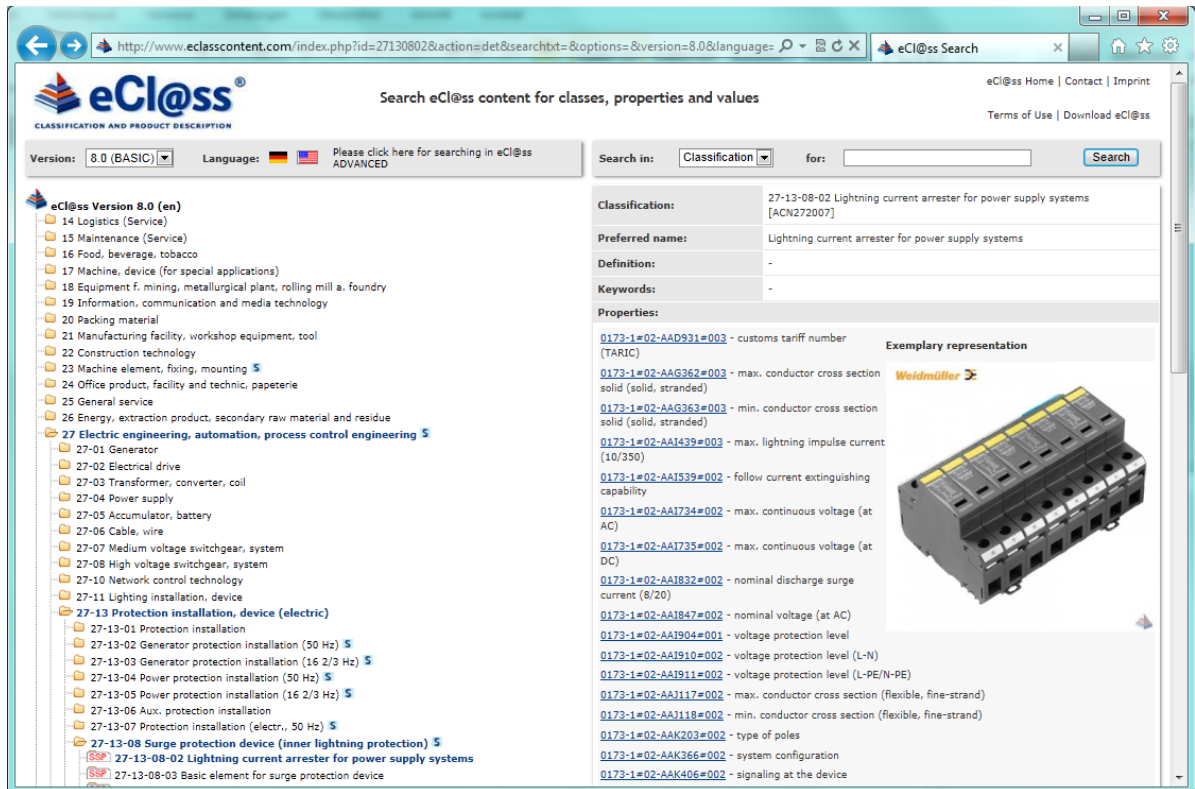
3.1.6 Interactive Instruments

In this section, we present and examine interactive instruments that go beyond the narrow scope of search functionalities. The other three classification systems eCl@ss, GPC and UNSPSC offer some interactive instruments which are not available on the CPV. These are, in particular, web seminars[39] and a Wiki[40].

In addition, from the user's point of view (cf. sections 4.3 and 4.4), there are some interactive tools that could improve the functioning and usability of the CPV. These are explained in the following section.

Generating CPV codes
Currently a contracting authority finds appropriate CPV codes by browsing, searching or by falling back on experience ("my favourites"). Alternatively, there are tools that can help in the generation of codes:
- Implementation of a text-based analysis tool that automatically generates suggestions for appropriate codes, based on the tender text;
- Complete rebuilding of the search for codes. Within the current CPV user interface a code is either selected from the favourites or selected by browsing the tree structure. Another possibility for the future would be for matching codes also to be generated by a text-based selection which gradually generates a suitable code. For example, a main aspect is defined first (main aspects might, for example, be planning or construction) which is specified in the following steps. In this way, (an) appropriate code(s) is (are) generated without requiring the user to select a code directly.

E-learning tools
Suppliers are sometimes not familiar with the CPV, since in general, a low level of awareness of the CPV and TED functionalities was observed. At the same time, contracting authorities using the CPV only seldom find it difficult to detect the appropriate codes. It is therefore a challenge to educate end-users in the (correct) use of the CPV. E-learning tools such as those explained below would facilitate the access for these users to the CPV. The basic functionalities and issues relating to the CPV could be explained within these tools.
- Webinar: a web seminar could provide an overview of the code set, how it is designed and how it can be used. Additionally, it could illustrate potential benefits and how organisations can get involved with the development and management of the code set.
- Wiki: a wiki is a website which allows its users to add, modify or delete its content via a web browser, typically using a simplified markup language or a rich-text editor. Most wikis are created collaboratively. They serve many different purposes, such as knowledge management and note taking. Some permit control over different functions (levels of access). For example, editing rights may allow for changing, adding or removing material. Others may permit access without enforcing access control. Other rules may also be imposed for organising content[41]. A CPV wiki could help users with a better understanding of the purpose and function of the CPV. As part of a wiki, there could be also detailed explanations and examples for different codes.

Feedback mechanisms
Feedback mechanisms (social media approach) would support users with questions about the correct use of the CPV or about the development and improvement of the CPV (see also section 3.3 below):
- Users could discuss proper use of certain codes in an online-forum. This would help contracting authorities in finding suitable codes and would therefore generally improve the quality of the encoding of notices;
- Users should have the possibility of immediately reporting errors and suggestions within a standard feedback mechanism, which should be supported by a workflow system;

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[39] http://www.unspsc.org/webseminar.asp; http://wiki.eclass.eu/wiki/Webinar-Recordings
[40] http://wiki.eclass.eu/wiki/Main_Page
[41] http://en.wikipedia.org/wiki/Wiki

- Users could be able to create content – they could suggest entries, categories etc. and by doing so enhance the CPV.

Mapping tools

Mapping tools help the comparison of the codes of different classification systems with each other and to reconcile them, i.e. they provide an overview of where to find information about CPV codes in eCl@ss, GPC and UNSPSC. Mapping tools are useful if a contracting authority has mapped an internal product group structure based on UNSPSC and then launches tenders for replacements: by using a mapping tool the contracting authority can easily find the CPV codes corresponding to its UNSPSC based commodity groups. Another example is that a supplier who has provided its products with eCl@ss codes can easily find out what the corresponding CPV codes are without the need to search manually through the entire CPV.

3.1.7 Examination of cost-benefit ratio

A key question is which tool could be most effective in improving the functioning of the CPV. There are two aspects: enhancement of the search function, and a more general improvement of the functioning of the CPV which implies completely new interactive tools.

Expenditures from improving the search function should be offset by the benefits of better usability. In the case of new tools which have to be developed, a decision has to be taken as to whether the potential benefit justifies the effort. Therefore, the objectives of the CPV have to be considered in order to assess how much work on the development of new tools is justified.

Improving the search function should directly be integrated into SIMAP/TED. The improved search function should be available to contracting authorities as well as to bidders. Other interactive tools could be offered as additional services (stand-alone tools). In the following section we explicitly assess both routes.

Improving and expanding search functions

- A web-based search engine which displays search results automatically when entering search terms: There would be costs in the implementation of such a tool. However, the value would be very high as it will benefit all users of the CPV.

- Allow direct entry of CPV codes in SIMAP forms: the expenditure that would be needed for the implementation would be low. It would benefit those contracting authorities that use SIMAP often and know which codes they have to enter by eliminating the currently complicated way of searching codes.

- Search by keywords and synonyms: the expenditure that would be needed for the implementation of such functionality would be very high because keywords (and synonyms) have to be added to the CPV. Adjustments would have to be made in all official languages of the EU. Such an adjustment would provide benefits to contracting authorities and enterprises.

- An option to narrow search areas within the CPV: the costs of implementation would be relatively low. However, the structure of the CPV would have to be improved in order to allow search areas to be narrowed. The benefit of this option would be that the complexity of the hit lists would be reduced and thus the usability of the CPV for contracting authorities and enterprises increased.

- Self-learning search functions like Google: the costs for implementing these functions would be relatively high. Even though these functions would be beneficial, the development of other tools is to be preferred.

- A service to provide detailed explanations of products, works and services described by a certain code: if this were done by a central authority, the costs would be extremely high, especially as adjustments would have to be made available in all official EU languages. If

user-generated content were resorted to, e.g. in the form of a wiki, the expense would be justified.

- The possibility of viewing actual current and past real tenders which have used a particular CPV code: the technical effort in implementing such tools would not be very high, but the incorrect use of codes in tenders might limit the usefulness of this measure. Even though these functions would be somewhat beneficial, the development of other tools is to be preferred.

Interactive Instruments

- Generating CPV codes – implementation of a text-based analysis tool: the expenditure needed for the implementation of such a tool would be very high. Adjustments would have to be made in all official languages of the EU. Even though these functions would be beneficial, the development of other interactive tools is to be preferred.

- Web seminars: the expenditure needed would be low while the benefit would be high as web seminars represent an easy way of learning how to use the CPV. Since both contracting authorities and bidders benefit, this measure should be implemented.

- Wiki: the expenditure needed for this would be low, particularly as the users of the CPV generate most of the content themselves. Since both contracting authorities and bidders would benefit, this measure should be implemented.

- Option to immediately report errors and suggestions within a standard feedback mechanism: the expenditure needed for this would below. Since this would enhance the overall quality of the CPV, this measure should be implemented.

- Implementation of an online forum as a platform where users could discuss proper use of certain codes: this could help contracting authorities in finding suitable codes and therefore it could improve the quality of the encoding of notices in general. The expenditure that would be needed for this is low, particularly as CPV users would generate most of the content themselves. Since both contracting authorities and bidders would benefit, this measure should be implemented.

- Mapping tools: the expenditure needed to implement such a tool would not be high from a technical point of view; but developing and maintaining the mapping tables would be extremely complex and would only be gradually feasible. Even though these functions would be beneficial the development of other interactive tools is to be preferred.

> **Conclusion:** The search function offered by TED/SIMAP is less user-friendly than other web-based searches already offered by third parties. The search function could be improved according to the suggestion presented in section 3.1.5. It is estimated that the costs would be low and the benefits high. Interactive instruments which could be useful are web seminars, a wiki and feedback functionalities, which are presented in section 3.1.6.

3.2   Integration of the CPV in an e-procurement environment

In the following section, we analyse the CPV and its usability for e-procurement. We develop scenarios for the enhancement of the CPV and provide recommendations for its further development in an e-procurement environment.

First, we define the e-procurement phases. Then we look at the results of the online survey in relation to the procurement/sales process and classification systems and e-catalogues. We then proceed to define the requirements for classification systems in relation to these e-procurement phases. We continue with the analysis of the coverage of the CPV with regard to the requirements for e-procurement phases. Finally, we develop scenarios, identify necessary tasks for each scenario and assess each scenario.

3.2.1 The CPV and e-procurement

The European Commission[42] is seeking to make improvements to public procurement – especially with a view to expanding e-procurement and making efficiency gains in the allocation of public funding in Europe. It also wants to promote the access of small and medium-sized businesses to public tenders.

By creating the CPV nomenclature, it established an integrated classification system for the field of public procurement. This simplified the reference systems used by public authorities in order to describe the subject matter of their procurement request (e.g. SIMAP). This makes it easier for potential bidders to identify relevant public tenders; it increases transparency within public procurement and it ultimately offers a contribution to the simplification and funding of electronic business operations.

For practical purposes, however, the use of the CPV is limited in the case of public authorities only to conducting procurement. This means specifically that the CPV is merely used for Europe-wide tenders. In the case of potential bidders, the CPV is used for quicker identification of Europe-wide tenders.

There is no integration of the CPV classification system into complete e-procurement. In order to support the change from paper-based to electronic media-discontinuity-free processes a broad, detailed and regularly updated classification system is, however, inevitable.

Within public discussion and awareness, "e-procurement" is usually restricted to the "pre-award phases"[43]. The "pre-award phases", however, are only one side of the procurement coin. They can be considered as instruments to execute tenders and awards electronically on specific platforms. The overall process of public procurement from planning and supervision of requirements through implementation (e.g. through tenders) up to the fulfilment of demands is far more complex.

In order to support fully public entities in the conversion from existing procurement to electronic, media-discontinuity-free processes, it is crucial to provide a complete illustration the procurement efforts in their entirety with all the interleaving interior and exterior systems as well as the comprehensive monitoring.

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[42] Cf.:
- Press release "Delivering savings for Europe: moving to full e-procurement for all public purchases by 2016" (20/04/2012), http://europa.eu/rapid/press-release_IP-12-389_en.htm?locale=en;
- Communication " A strategy for e-procurement", COM(2012) 179 final, http://ec.europa.eu/internal_market/publicprocurement/docs/eprocurement/strategy/COM_2012_en.pdf;
- "Action plan for the implementation of the legal framework for electronic public procurement", http://ec.europa.eu/internal_market/publicprocurement/docs/eprocurement/actionplan/actionplan_en.pdf

[43] The "pre-award phases" include the phases eNotification, eAccess, eSubmission and eEvaluation/eAwarding, cf. "Study on the evaluation of the Action Plan for the implementation of the legal framework for electronic procurement"; http://ec.europa.eu/internal_market/consultations/docs/2010/e-procurement/siemens-study_en.pdf

In particular, the alignment of business processes within the fields of procurement needs to be considered as the premise for prospectively combining all the instruments of e-procurement in an integrated and efficient overall process. Herein lie the actual obstacles to the process of enhancing e-procurement.

3.2.2 E-procurement phases

In this section we describe the different phases of e-procurement.

For this task, we have slightly modified the model from the "Study on the evaluation of the Action Plan for the implementation of the legal framework for electronic procurement"[44]. The modification comprises the integration of additional phases and the merging of existing phases and is based on the process REPROC model[45]. REPROC was developed as part of a funding initiative of the German Federal Ministry of Economics and Technology (BMWi) in cooperation with alliance partners from the public sector. The aim of REPROC was to create prerequisites for the development and deployment of efficient and seamless e-government solutions for the procurement of federal, state, local authorities and self-governing bodies.

1. Procurement planning
We added this phase because a procurement process usually does not start directly with eNotification but with the identification and description of requirements, and the functional and economic release.

2. Procurement preparation
We also added the phase procurement preparation. Once the procurement planning phase is completed, the procurement department prepares the tender documents.

3. Publication of tender documents and submission of tenders
This phase merges the three phases of eNotification, eAccess and eSubmission from the model: the electronic publication of tendering opportunities, including via procurement notices (eNotification), the publication of the necessary documentation (eAccess) and the electronically submitting of an offer (eSubmission).

4. Bid evaluation and award
This phase corresponds to the eEvaluation/eAwarding phase in the model. eEvaluation and eAwarding refer to the partial or entire automation (i.e. decision support) of the assessment of bids (eEvaluation) and the formalisation and communication of the outcome to the tenderers (eAwarding).

5. Ordering
This phase corresponds to the eOrdering phase of the model and includes the automatic placement of orders online, particularly through the use of eCatalogues. eOrdering occurs only in cases where the procurement contract concluded has established a framework within which supplies or services can be ordered.

6. Invoicing and Payment
This phase merges the phases of eInvoicing and ePayment from the model: the automated process of issuing, sending, receiving and processing of invoice and billing data by electronic means (eInvoicing) and the digital financial payment transaction involving funds transfer between two or more parties (ePayment).

7. Procurement controlling
We added this phase for the identification of key data for procurement management.

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[44] http://ec.europa.eu/internal_market/consultations/docs/2010/e-procurement/siemens-study_en.pdf
[45] http://www.bme.de/Referenz-Prozessmodell.prozessmodell.0.html

3.2.3 Results of the online survey

Buy side: Procurement process and classification systems

The questions below (Figure 50 to Figure 53) were asked to contracting authorities. The results are representative for the EU.

Figure 50 below shows whether respondents use a classification system and which at the different steps of the procurement process.

Figure 50: Usage of classification systems in the procurement process (contracting authorities)

Which of the following classification systems do you use at the different steps of the procurement process?

N = 1580 - 2234   ■CPV ■GPC ■UNSPSC ■eCl@ss ■Other ■None
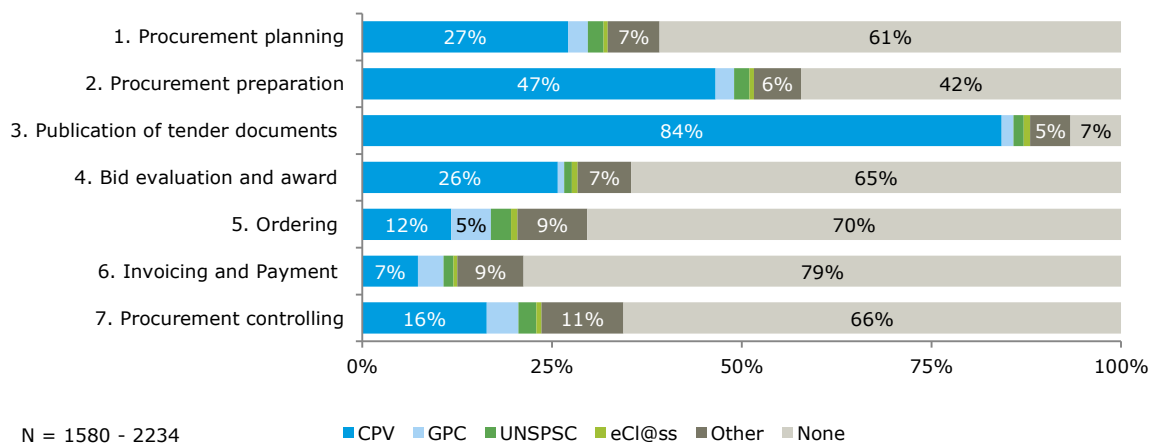
Most contracting authorities use classification systems only for the "Procurement preparation" and "Publication of tender documents" phases. If a classification system is used, then it is most likely to be the CPV, and it is used by 84% in the publication of tender documents. The phase "Invoicing and Payment" is the exception; there, other systems are used more, usually in-house commodity group systems.

In Figure 51 we consider for which phases a classification system provides added value.

Figure 51: Added value of classification systems in the procurement process (contracting authorities)

Is the use of a classification system at the different steps of the procurement process an added value?

N = 2506 - 2601   ■Yes ■Do not know / not specified ■No
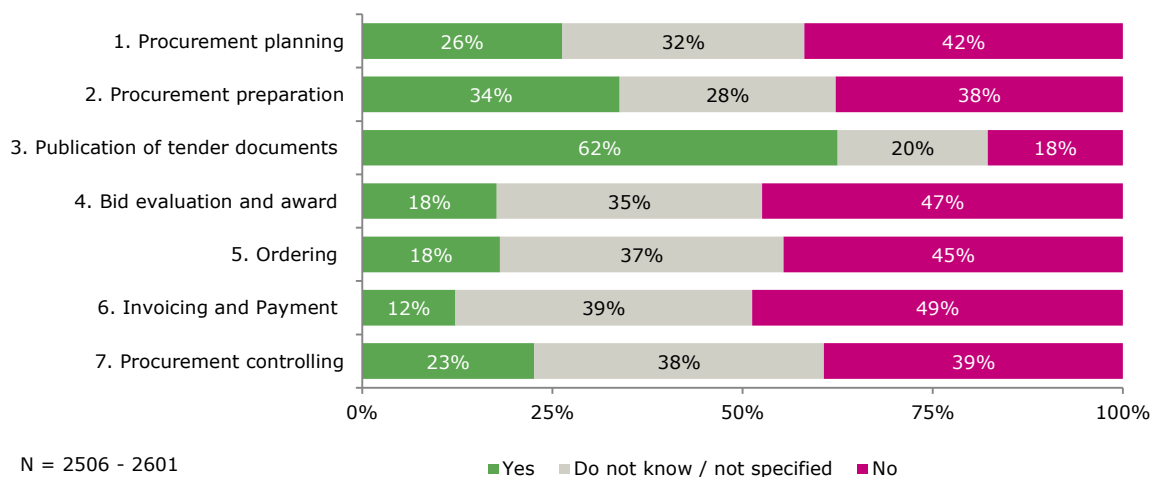
The respondents generally deem that classification systems provide added value mainly in the "Publication of tender documents" (64%) phase.

When looking at Figure 52 we see that the respondents also deem that the CPV has added value only in the "Publication of tender documents" phase.

Figure 52: Added value of the CPV in the procurement process (contracting authorities)

Is the use the CPV at the different steps of the procurement process an added value?

N = 2333 - 2400

■ Yes ■ Do not know / not specified ■ No
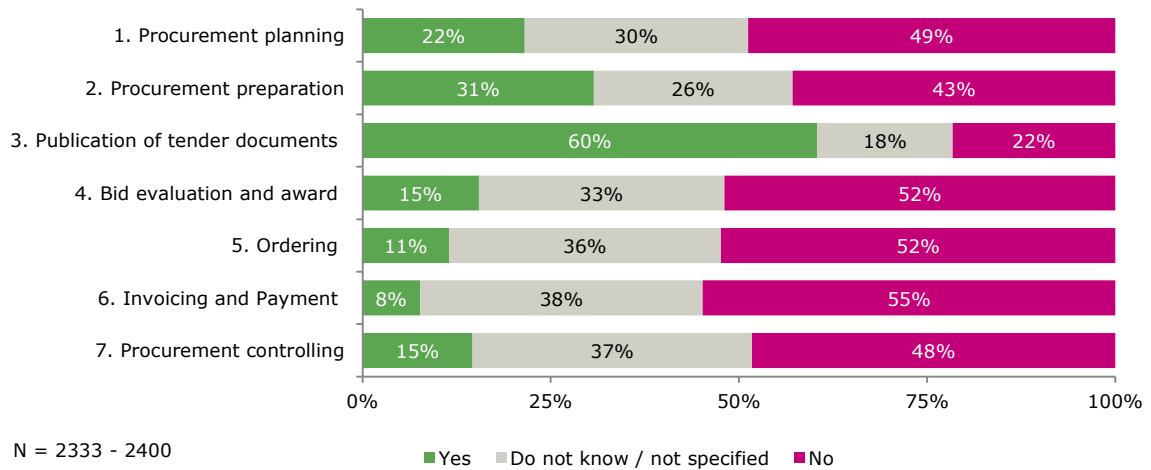
In comparison with the question of whether classification systems are generally regarded as adding value (see Figure 51), the CPV comes out slightly worse in all phases of the process.

The survey demonstrates, therefore, that the CPV is used mainly in the "Publication of tender document" phase, and it is largely only in this phase that is seen as adding value, as is the perception of classification systems in general.

The respondents consider it important that a system be easy to use, so there is an added value, as the following responses from the survey show by way of example:
- "be simple and understandable to everyone"
- "be simple to use"
- "clear, easy to use"
- "easy to use"
- "easy to use and understand"
- "simple to understand with logical structure"
- "simple, clear"
- "simplicity and easy to use".

Figure 53 shows the opinion of the respondents when asked if they would judge it an added value if there were a classification system that covered the complete procurement process.

Figure 53: Classification covering the complete procurement process (contracting authorities)

Would you judge it as an added value if there is a classification system that would cover the complete procurement process (from the assessment of demand to invoicing)?

26%	45%	29%

0%　　　　　25%　　　　　50%　　　　　75%　　　　　100%

N = 2586　　　　　■Yes　■Do not know / not specified　■No
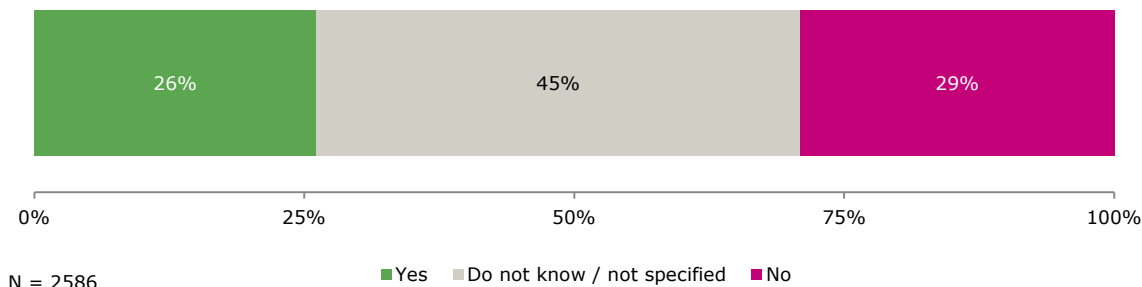
The proportion of those who see no added value in a classification system that covers the entire process is slightly larger (29%) than the proportion of those who see an added value (26%).

When looking at the reasons for their assessment, it should be noted that among those who answered "No", many answers suggest that the question was not understood, e.g.
- "After the bidding and contract, there is no interest for invoice etc. for anyone, but the winning party;"
- "We use CPV as a means to attract bidders within a specified product/service group;"
- "Sorry, but I think CPV is only a classification, nothing else, so in what way can that improve the actual system?"
- "Text-based search engines are more flexible".
- "CPV coding is of no value when you are normally looking for Quality, Price and Delivery time."

As the question seems to have been misunderstood by certain respondents the results should therefore be analysed with precaution.

Sell side: Sales process and classification systems

We are now looking at sales process. The questions below (Figure 54 to Figure 56) were asked to suppliers.

Figure 54 below shows whether respondents use a classification system and which at the different steps of the sales process.

Figure 54: Usage of classification systems in the sales process (bidders)

Which of the following classification systems do you use at the different steps of the sales process?

N = 1296 - 2157

Legend: CPV, GPC, UNSPSC, eCl@ss, Other, None
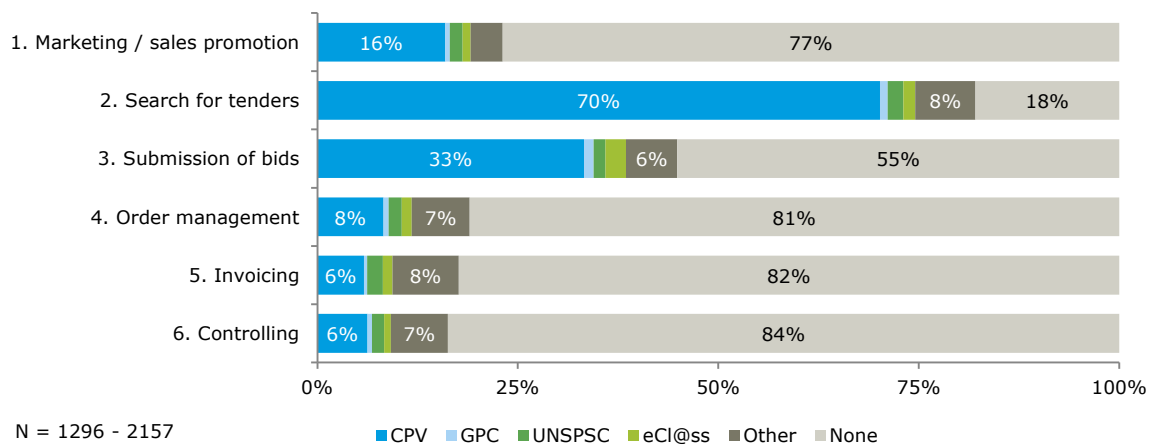
Classification systems are used by the majority of the suppliers only in the phase "Search for tenders". If a classification system is used, then it is most likely to be the CPV (70%). The "Invoicing" and "Controlling" phases are the exception; there, other systems are used more often, usually in-house commodity group systems.

In Figure 55 we consider at which phases of the sales process a classification system provides added value.

Figure 55: Added value of classification systems in the sales process (bidders)

Is the use of a classification system at the different steps of the sales process an added value?

N = 2569 - 2704

Legend: Yes, Do not know / not specified, No
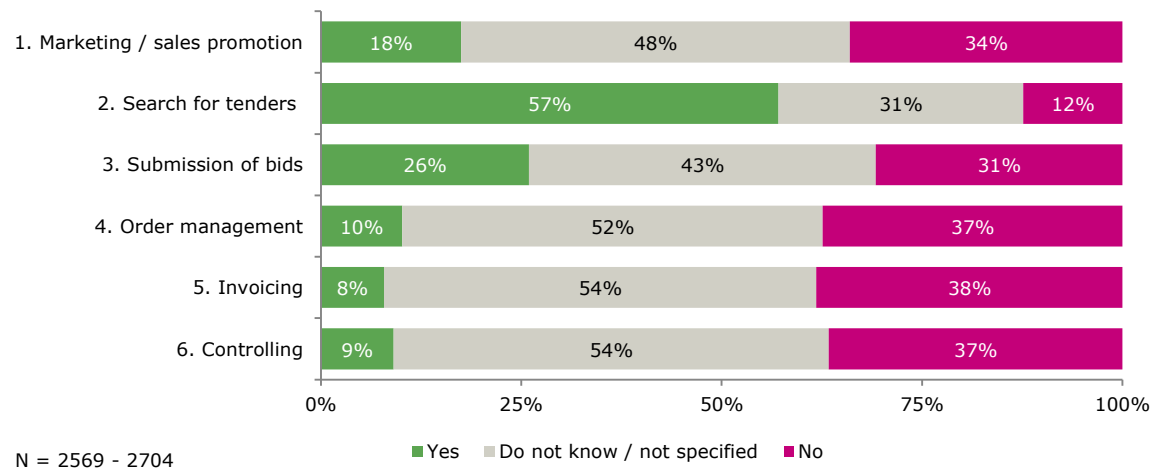
The respondents generally deem that classification systems provide added value mainly in the "Search for tenders" phase (57%).

When looking at Figure 56 we see that the respondents also deem that the CPV has added value only in the "Search for tenders" phase.

Figure 56: Added value of the CPV in the sales process (bidders)

Is the use of the CPV at the different steps of the sales process an added value?

N = 2587 - 2721   ■ Yes   ■ Do not know / not specified   ■ No
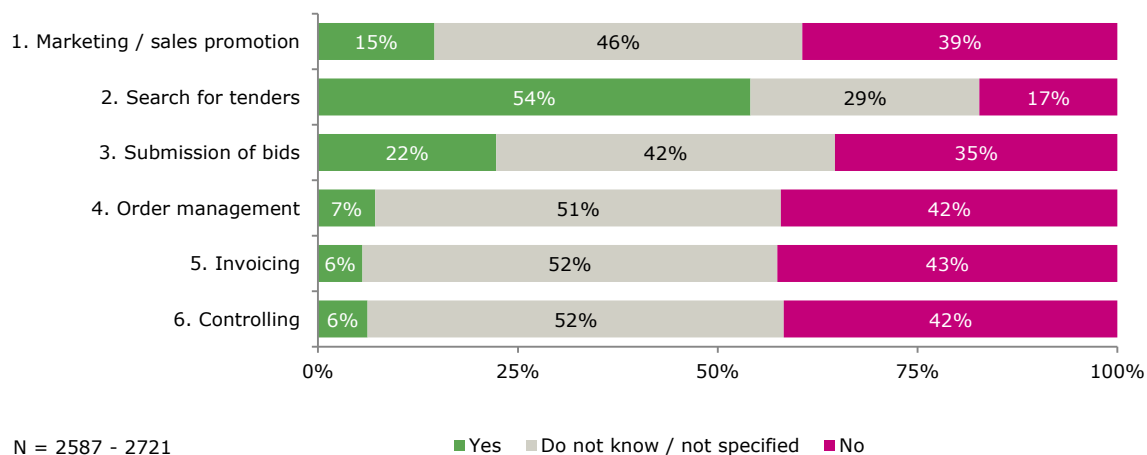
In comparison with the question as to whether classification systems are generally regarded as adding value (see Figure 55), the CPV comes out slightly worse in all phases of the process.

E-catalogues

E-catalogues are electronic documents established by suppliers which describe products and prices in a structured manner. From a technical perspective, they can take virtually any form, ranging from general text documents (e.g. in PDF or MS Word) or spread sheets that can be consulted by any human reader, to highly standardised XML formats which can also be automatically processed in a more systematic and useful manner in certain eProcurement systems[46].

The questions below (Figure 57 to Figure 60) were asked to both contracting authorities and suppliers.

Figure 57 below shows the usage of e-catalogues within organisations responding to the survey.

Figure 57: Usage of e-catalogues

Do you use e-catalogues within your organisation?

N = 483 - 2875
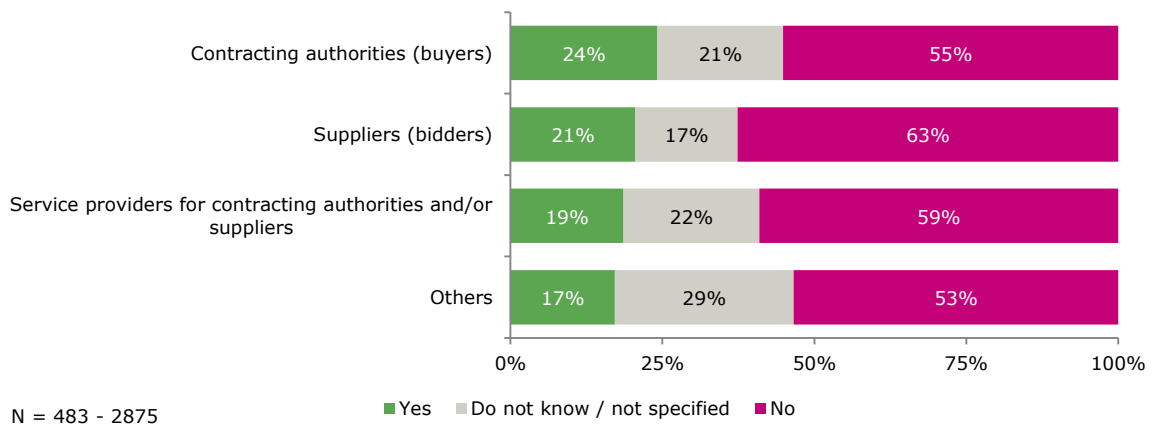
Electronic catalogues are hardly used by any of these organisations regardless of their role in relation to public procurement.

Figure 58 shows which classification system is mostly used within the e-catalogues.

Figure 58: Usage of classification systems within e-catalogues

Which classification system do you use within electronic catalogues?

N = 1642

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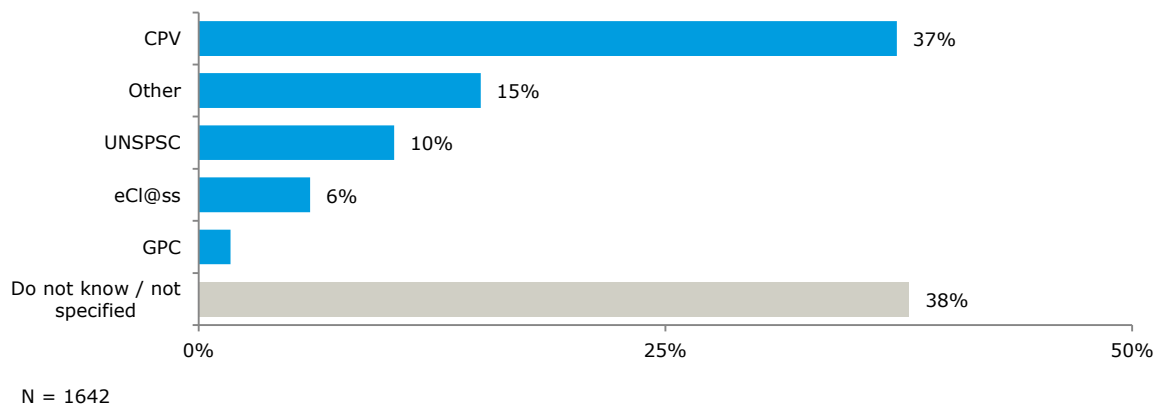
[46] http://ec.europa.eu/internal_market/consultations/docs/2010/e-procurement/siemens-study_en.pdf

Where organisations do use electronic catalogues the CPV is the most used classification system (37%). This was also confirmed during the interviews with eSenders (see also section <u>4.4</u>).

When asked if the CPV is very suitable for describing supplies in an electronic catalogue, 40% of the respondents answered with "strongly agree" or "agree" – see Figure 59.

Figure 59: Suitability of the CPV for e-catalogues

Do you agree with the following statement? The CPV is very suitable for describing supplies in an electronic catalogue.

| 6% | 34% | 25% | 12% | 5% | 18% |

■ Strongly agree ■ Agree ■ Neutral ■ Disagree ■ Strongly disagree ■ Do not know / not specified

N = 1632
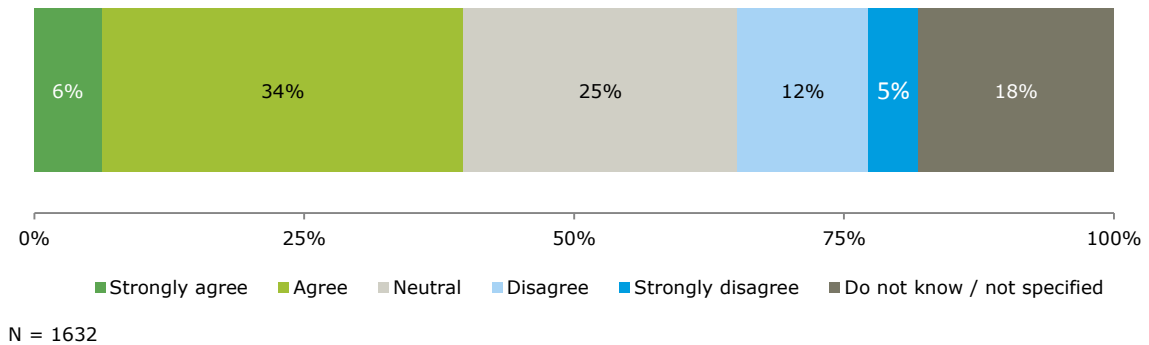
For those who gave a reason for their positive answer, there must be some question as to whether the answer was actually related to e-catalogues, as the following examples show.
- "A suitable CPV will eliminate ambiguity, confusion, and occult interest during the electronic tenders";
- "When searching for opportunities we use the CPV codes applicable to our organisation so that it only brings up these opportunities;"
- "The TED system provides fewer false positives than any other tender tracking system that we subscribe to;"
- "A code which is the same for all suppliers in Europe;"
- "Helps a public institution find the right contractors;"
- "Good idea - it directs people to use the correct code according to the description;"
- "The CPV value is an accurate way of assisting the interrogation of opportunities;"
- "The CPV helps to identify the tenders that are most/least relevant to us;".
- "I usually find the required codes;"

The results from Figure 58 and Figure 59 should therefore be analysed with precaution as the questions seem to have been misunderstood by certain respondents.

Figure 60 below shows respondents' perspective on the changes needed to facilitate the use of the CPV in e-catalogues.

Figure 60: Changes to facilitate the use of the CPV in e-catalogues

What changes are needed to facilitate the use of the CPV in e-catalogues?

Synonyms and keywords have to be added to the CPV	34%
The CPV needs to be more detailed	32%
Feature lists and attributes have to be added to the CPV	26%
No change is needed	9%
Other	6%
Do not know / not specified	28%

N = 1611
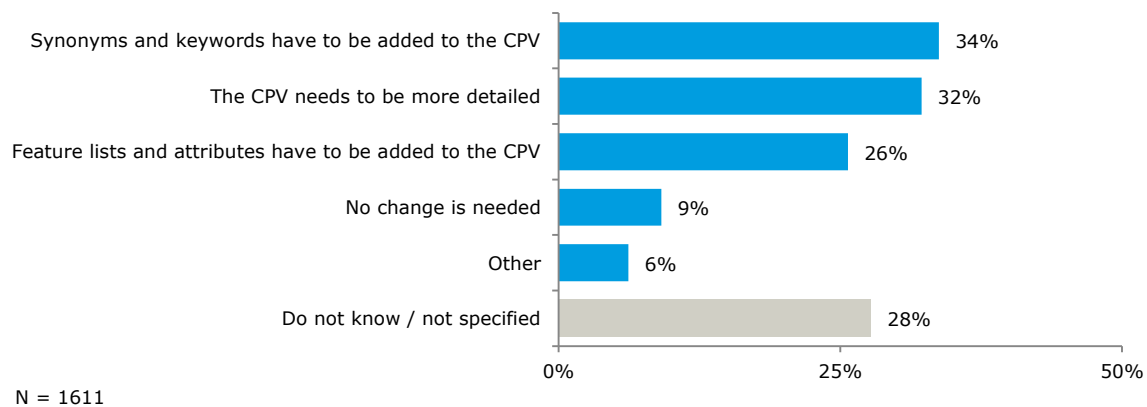
The changes thought to be most needed are synonyms and keywords (34%) and more detail (32%). A further 26% would like to see attributes and features added. Only 9% of the respondents say that no changes are needed to facilitate the use of the CPV in e-catalogues.

3.2.4 Requirements for classification systems in relation to e-procurement phases

In this section we describe criteria for the selection and use of classification systems in relation to the different phases of eProcurement. We draw on the assistance for classification systems[47] which is provided by PROZEUS. PROZEUS – supported since 2002 by the German Federal Ministry of Economics and Technology (BMWi) – has pioneered a "market as multiplier" standards dissemination approach that has been able to overcome the failure in disseminating e-Business standards to SMEs.

Table 24 shows Criteria for the selection and use of classification systems.

Table 24: Criteria for the selection and use of classification systems in alphabetical order

Criteria	Description
Acceptance	What is the dissemination of the system?
According to norms	Does the data model of the system comply with standards?
Application area	Can the system be used across industries?
Attributes	Does the system provide features complying with standards?
Certification	Can the products classified by a system be certified?
Cost/Time for implementation	How much effort is required to implement the system?
Documentation	How clear is the documentation?
Internationality	What is the international dissemination of the system?
Investment protection	What is the investment security of the system?
Keywords/ synonyms	Does the system facilitate the search by keywords?
Language versions	How many languages are available in what quality?
Possibilities for influencing the development	What are the possibilities for influencing the development of the system?
Possible savings	What are the potential savings when using the system?
Practicability	How easy is use of the system?
Process orientation	How far is the system integrated into existing process chains?
Search facilities	What possibilities does the system provide for research?
Support at change of version	What help will be given when a version changes?
Use exempt from charges	Is the use of the system free of charge?

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[47] http://www.prozeus.de/imperia/md/content/prozeus/broschueren/han_klassifikationsstandard.pdf

In the next step we assess the criteria listed in Table 24 in relation to their relevance for the e-procurement process.

Table 25: Assessment of criteria in relation to their relevance for the e-procurement process

Criteria	Assessment of the criteria
Acceptance	The acceptance of a classification system is relevant for all phases of e-procurement.
According to norms	It is relevant for all phases of e-procurement that the data model of the system complies with standards.
Application area	The application area of a classification system is relevant for all phases of e-procurement.
Attributes	This is especially important for the procurement planning phase.
Certification	The certification of classified products is relevant for suppliers.
Cost/Time for implementation	This criterion is more relevant for suppliers due to the fact that they assign their products to the classes.
Documentation	The documentation of a classification system is relevant for all phases of e-procurement.
Internationality	The international dissemination of a classification system is relevant for all phases of e-procurement.
Investment protection	The investment protection of a classification system is relevant for all phases of e-procurement.
Keywords/ synonyms	The use of keywords/synonyms is particularly relevant for the phases of procurement planning and procurement preparation. Generally the classification code should be assigned to the need to be procured in these phases. The search for the correct code will be easier if the classification system provides keywords/synonyms.
Language versions	The presence of sufficiently good quality language versions is particularly relevant for the procurement planning and procurement preparation phases.
Possibilities for influencing the development	The possibilities for influencing the development of a classification system are relevant for all phases of e-procurement.
Possible savings	The higher the utilisation rate and the dissemination of a standard the higher its potential savings. An essential element for the potential savings is the presence of attributes, as this enables more precise search opportunities. This is especially important for the procurement planning phase.
Practicability	The practicability of the system is enhanced by class-specific feature lists and lists of values. This is especially important for the procurement planning phase.
Process orientation	The process orientation is relevant for all phases of e-procurement.
Search facilities	The possibilities for research are particularly relevant for the procurement planning and procurement preparation phases.
Support at change of version	The support given at change of a version of a classification system is relevant for the implementation in IT systems and therefore relevant for all phases of e-procurement.
Use exempt from charges	The use of a classification system free of charge is relevant for all phases of e-procurement.

As a result of the review of the table above, the criteria can be grouped into four categories in relation to their relevance for the e-procurement phases (cf. section 3.2.2).

1. Criteria that are of equal importance for all e-procurement phases:
   - Acceptance
   - According to norms
   - Application area
   - Documentation
   - Internationality
   - Investment protection
   - Possibilities for influencing the development
   - Process orientation
   - Support at change of version
   - Use exempt from charges.

2. Criteria that are especially important for the procurement planning phase:
   - Attributes
   - Keywords/ synonyms
   - Language versions
   - Possible savings
   - Practicability
   - Search facilities.

3. Criteria that are especially important for the procurement preparation phase:
   - Keywords/ synonyms
   - Language versions
   - Search facilities.

4. Criteria that can be set aside in further consideration:
   - Certification
   - Cost/Time for implementation.

3.2.5 Scenarios for enhancement of the CPV

Based on a thorough comparison of the classification systems among each other made by PROZEUS we conclude the following:

Compliance with standards

If the CPV would be designed for usage in e-catalogues, it should integrate and refer to as many existing international standards as possible, in its structure, its data model and content (e.g. ISO 13584, ISO 29002 and others) Using standardised properties (if desired) to further describe classification classes (e.g. eCl@ss uses DIN properties), or standardised values list (if desired, e.g. RAL-values for colours) as well as, for example, ISO country and language codes (ISO3166 and ISO 639-1) will always lead to more interoperability.

Furthermore, the CPV should introduce rules and regulations (guidelines) to define the structure, terminology and semantic outline etc., e.g. the current usage of both the singular and plural forms of product classes is confusing and does not help in searching products.

Among the valid punctuation marks used in the CPV are the colon and the semicolon. We recommend deleting both of them in every text field to optimise machine-readable documents.

Attributes and keywords/synonyms

The CPV in its current 2008 version has a supplementary vocabulary which contains properties to describe product classes. Attributes and values are particularly important for the use of electronic catalogues by the end-user. They allow a precise search.

The CPV does not at the moment provide keywords or synonyms. Keywords/synonyms are far more important for preparing the tender documents than attributes and values. The detailed information made available through description of supplies/works/services via attributes and

values should not be relevant for the supplier in finding tenders as the following example from TED[48] shows:

- The object of the contract is furniture (39100000), office furniture (39130000) and miscellaneous furniture and equipment (39150000).
- The quality or scope of the tendering, which can only be seen by using the original language, is approximately 151 desks and conference tables in several versions, about 9 piece of shelving in several versions, about 141 pieces of sideboards in several versions, about 143 pieces of mobile file cabinets in several versions, about 139 pieces of office cupboards and lockers in several versions, 1 piece of reception counter, about 145 wastebaskets, and so on.
- Even though the code for tables, cupboards, desks and bookcases (39120000) may be missing, the potential suppliers should have no problem in identifying this tender if they are a manufacturer, retailer or reseller of furniture.
- There is no added value for the suppliers in finding the tender if the conference table, for example, is additionally described with the value for the attribute "thickness of the panel" or the value for the attribute "colour of table top".

Scenario 1: Self-development of attributes and keywords/synonyms

Below we describe the activities for self-development of attributes and keywords/synonyms for the CPV.

First of all, a data model must be developed for keywords and synonyms. Then, keywords and synonyms have to be defined for the 9,454 elements of the CPV. By way of comparison, eCl@ss started in 2002 with some 4,800 elements and 8,000 keywords; with version 6 it has about 33,000 classes and 51,000 keywords.

The CPV supplementary vocabulary consists of 903 items. Its use of properties is not yet comparable to those in the GPC or eCl@ss:

- Every item of the supplementary vocabulary can be combined with each class. For example, you can theoretically expand the description of a theatre seat (39111200) with the form BA09-6 Gas from the supplementary vocabulary which in practice does not make any sense.
- Most CPV properties are not descriptive but only describe the application area of a product class, e.g. for micro-economics (RB01-0), for macro-economics (RB02-3), for industrial economics (RB03-6) etc.
- The CPV does not distinguish between properties and values, e.g. properties like gold, silver, and platinum would be a value list of the property material.

The CPV should enhance the amount of information delivered with the supplementary vocabulary with the following measures:

- The CPV should restructure the properties and distinguish between properties and values;
- The CPV should define relations between classes and specific properties;
- The CPV should add more descriptive properties, while keeping the properties for the application areas.

By way of comparison, eCl@ss started in 2002 with some 4,800 elements and 2,500 properties; with version 6 it has some 33,000 classes, 8,600 properties and 6,800 values.

This scenario supports the user in increasing the use of e-procurement. It is not thought that the scenario would create more costs for the users.

This scenario is feasible. However, the effort to develop the attributes and keywords/synonyms should not be underestimated.

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[48] Supply contract - 352082-2012, http://ted.europa.eu/udl?uri=TED:NOTICE:352082-2012:TEXT:EN:HTML&tabId=1

Scenario 2: Collaboration with another classification system

Below we describe the activities for collaborating with another classification system to develop attributes and keywords/synonyms for the CPV.

The CPV could basically use the data model for keywords from another classification system. The main task would be to map all the elements of the other classification system with keywords to the corresponding CPV element. If necessary, the keywords from one element of the other classification system would be split into different CPV elements.

The CPV could also use the data model for properties and values from the other classification systems. It would also seem useful to restructure the CPV due to the fact that properties and values may be located at other hierarchical levels in the other classification system.

Attention would need to be paid to the maintenance process so that with a version change of the other classification system, the CPV keywords/synonyms and attributes were also adapted. The new properties and keywords/synonyms of existing elements would have to be updated and new elements with properties or keywords/synonyms mapped. It would be conceivable that the CPV would not be changed with every new release of the other classification system, but the mapping process would be a little more complex because several release upgrades would have to be performed at once.

This scenario supports the user in increasing the use of e-procurement. It is not thought that the scenario creates more costs for the users.

This scenario is feasible. The effort for the one-time mapping and for maintaining new versions should nevertheless be kept in mind.

Scenario 3: CPV as a classification system only for the publication of tender documents and not for e-catalogues

Below we describe the possibility of using the CPV solely for the publication of tender documents. Public authorities would be free to use their preferred classification system for e-catalogues. This could include the CPV.

This would have the following implications for practical usage:
- Contracting authorities would use the CPV for the publication of tender documents and could use another classification for e-catalogues.
- Bidders would use the CPV for identifying procurement opportunities. They might find themselves having to use one or more other classification system for their e-catalogues.

The possibilities open to both contracting authorities and bidders for using several classification systems in parallel would include:

1. The classification systems are not linked to each other:

   This would make it even more essential that contracting authorities be able to find the correct CPV code efficiently. It could be helpful to improve the CPV by reducing the level of detail to simplify the application of the CPV (cf. section 2.2.3) and by improving the structure of the CPV in terms of its consistency (cf. section 2.2.2). Furthermore it could be helpful to improve the search function offered by TED/SIMAP and to offer interactive instruments such as web seminars, a wiki and feedback functionalities for better guidance (cf. section 3.1.7).

   Equally, the absence of a link makes it all the more essential for *bidders* to be able to identify relevant procurement opportunities efficiently by reducing the incorrect use of the codes by buyers, leading to better search results for bidders. Implementing the measures above explained would achieve this. Furthermore it could be helpful to improve the search function offered by TED/SIMAP. Improving the text-based search would seem

to be the most helpful as this is (today) the dominant search approach for bidders (cf. section 2.1.3)

2. The classification systems are linked to each other.

   In this case; easy mapping of the CPV to other classification systems would be helpful in addition to the other improvements of reducing the level of detail and improving the structure. Doing this would improve conformity with other standards.

   Measures such as cMAP, which are carried out across all classification system in order to facilitate mapping, produce positive outcomes. The cMAP project has helped create a basis for simplifying the mapping between classification systems through the development of a mapping methodology, through the identification of the common maintenance for the mapping, through recommendations for the classification systems, through the definition of an architecture for an open standardised classification collaboration platform and through the definition of an synchronisation process.

This scenario is feasible.

3.2.6 The limitations of the CPV for e-procurement and the alternatives

The analysis of the CPV has shown that it can be used only to a limited extent for all phases of e-procurement.

The CPV has gaps in attributes and keywords/synonyms. These areas would need to be improved if the CPV were to integrate into e-procurement environments. There are several options for achieving this, starting with the self-development of attributes and keywords/synonyms through cooperation with another classification system to deliver attributes and keywords/synonyms, to using CPV exclusively for the publication of tender document.

The scenarios "1. Self development" and "2. Collaboration with another classification system" have the backdrop of the very elaborate development and maintenance which would be required.

The advantages of Scenario 3 with a simplified CPV structure are that the CPV can be better linked to other classification systems, that it makes it easier for the contracting authorities to select the right code when publishing the tender and that it makes it easier for suppliers to find suitable tenders efficiently. The disadvantage of Scenario 3 is that there would be no mandatory classification system for e-catalogues.

> **Conclusion:** The CPV can currently be used only to a limited extent for all phases of e-procurement. To integrate the CPV's gaps into an e-procurement environment, the CPV attributes and keywords/synonyms would need to be improved. Scenarios "1. Self-development" and "2. Collaboration with another classification system" appear feasible, but implementation would require considerable effort. The alternative is not to use the CPV for e-procurement but – as today – only as a classification system for the publication of tender documents (Scenario 3).

3.3 Maintenance (Updating the CPV in the light of market developments)

In the following section, we evaluate the status quo of the CPV maintenance process and provide recommendations on how to update the CPV in the light of to market developments. To obtain meaningful results for this task, our approach is based upon a three step process.

Firstly, we examine the maintenance processes of four classification systems CPV, eCl@ss, GPC and UNSPSC. This step is mainly informed by the outcomes of the CEN Workshop Agreement on "Classification and catalogue systems used in electronic public and private procurement" (CWA 16138[49]) and the Draft CEN Workshop Agreement on "Classification Mapping for open and standardized product classification usage in eBusiness" (cMap), Draft CWA version 4[50]. Section 4 of CWA 16138 comments on the similarities and differences between the four main existing product classifications in Europe. Section 6 of the cMap Draft describes the classification systems regarding the maintenance of mapping.

We then process the information gathered to compare the classification systems in terms of their maintenance processes. In the next step we look at the results of the online survey and assess them. Finally, we make recommendations for the possibilities of an update of the CPV.

3.3.1 Maintenance processes of the four classification systems

In this section we describe the release policies and the maintenance processes of the four classification. We conclude with a summary of the main differences and similarities.

1. CPV

Release Policy and release roadmap
The provision of new versions depends on numerous factors such as political decisions or legislative activity. It can generally be expected that the CPV will be modified not more than once every three to four years but other factors may influence this informal term. Therefore, no release roadmap exists.

Release Validity
There is only one version of CPV valid at a time.

Version compatibility[51]
No version compatibility policy is applied.

Types of change
From one version to the next version, codes can be added, transferred or removed. Descriptions that are attached to the codes can be amended. The structure can also be changed. A numerical code that has been deleted in one of the updates can be reused.

Change request
There is no formal change request process. Several mailboxes to which users can send comments, requests etc. are available[52] on the web. They serve as entry points for providing feedback.

Maintenance process
The CPV is an EU regulation; as such it follows the normal EU legislative process. The draft is first circulated to all interested Commission Directorates-General. It is next circulated to the Member States through the Advisory Committee for Public Contracts or ACPC. At the following step, the draft is reviewed by the Committee of the Regions and the Economic and Social Committee, and then submitted to the European Parliament

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[49] ftp://ftp.cen.eu/CEN/Sectors/List/ICT/CWAs/CWA16138.pdf

[50] ftp://ftp.cen.eu/CEN/Sectors/List/ICT/CWAs/cMap_CWA_Public_review.pdf

[51] Is a new release backward compatible and/or is an older release forward compatible?

[52] http://ec.europa.eu/internal_market/publicprocurement/contact_en.htm

Publication
The main vocabulary and the supplementary vocabulary can be downloaded free of charge from the SIMAP website[53] in four formats: PDF, XML, ODS and XLS. There is additional information available which can also be downloaded: CPV 2008 Guide (PDF), CPV 2008 Explanatory Notes (PDF) and CPV 2008 Supplementary Codes Explanatory Notes (PDF). The Commission provides release update files[54] which are called "correspondence tables". The structure of this file is rather simple. It includes all codes of the previous release and all codes of the subsequent, new release, including the description.

2. eCl@ss

Release Policy and release roadmap
eCl@ss differentiates between three different types of release:

- Major Releases (x.0):   are generally valid for approx. 2 to 3 years
- Minor Releases (n.x):   are published once or twice a year
- Service Packs (n.n.x):   are published as needed for every language version

Release Validity
Any version of eCl@ss is usable.

Version compatibility
- Major Releases (x.0):   are not downwards compatible to previous releases due to possible structural changes
- Minor Releases (n.x):   are downwards compatible within the same Major Release number
- Service Packs (n.n.x):   are downwards and upwards compatible to the previous Minor Release as well as to every Minor Release within the same Major Release number

Types of change
- Major Releases (x.0):   all possible modifications of existing structural elements (including structural modifications) and the addition of new structural elements, as well as modifications of the relations between existing structural elements.
- Minor Releases (n.x):   include the modification of certain attributes of existing structural elements (e.g. textual changes) and the addition of new structural elements, as well as new relations between new and/or existing structural elements
- Service Packs (n.n.x):   corrects a previously released language version by exclusively allowing textual changes in a specific language variant of the eCl@ss standard

Change request
Anyone interested can submit change requests free of charge on the eCl@ss Content Development Platform.

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[53] http://simap.europa.eu/codes-and-nomenclatures/codes-cpv/codes-cpv_en.htm
[54] http://ec.europa.eu/internal_market/publicprocurement/rules/current/index_en.htm

Maintenance process

The eCl@ss maintenance process is based on the recommended process proposed by the CEN Workshop ePDC[55] (see also Figure 61 below), which itself is based on ISO requirements[56] and at the same time is similar to the maintenance process of other standards such as the DIN property server[57].

eCl@ss uses globally unique identifiers for every object included in the eCl@ss standard. This IRDI (International Registration Data Identifier)[58] is based on ISO standards[59]. In this way, a classification class can be moved in the hierarchy, changing the class code and the version number without changing the object identifier.

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[55] See CWA 15295:2005 (Description of References and Data Models for Classification), p. 35ff.

[56] ISO/IEC Directives, Part 1: Procedures for the technical work. This part sets out the procedures to be followed within ISO and the IEC in carrying out their technical work: primarily the development and maintenance of International Standards through the activities of technical committees and their subsidiary bodies.

The states used for the items are derived from ISO guide 69 (Harmonized Stage Code system - Principles and guidelines for use)

[57] http://www.DINsml.net

[58] http://wiki.eclass.de/wiki/IRDI

[59] ISO/IEC 11179, ISO 29002, ISO/IEC 6523

Figure 61 The eCl@ss maintenance process
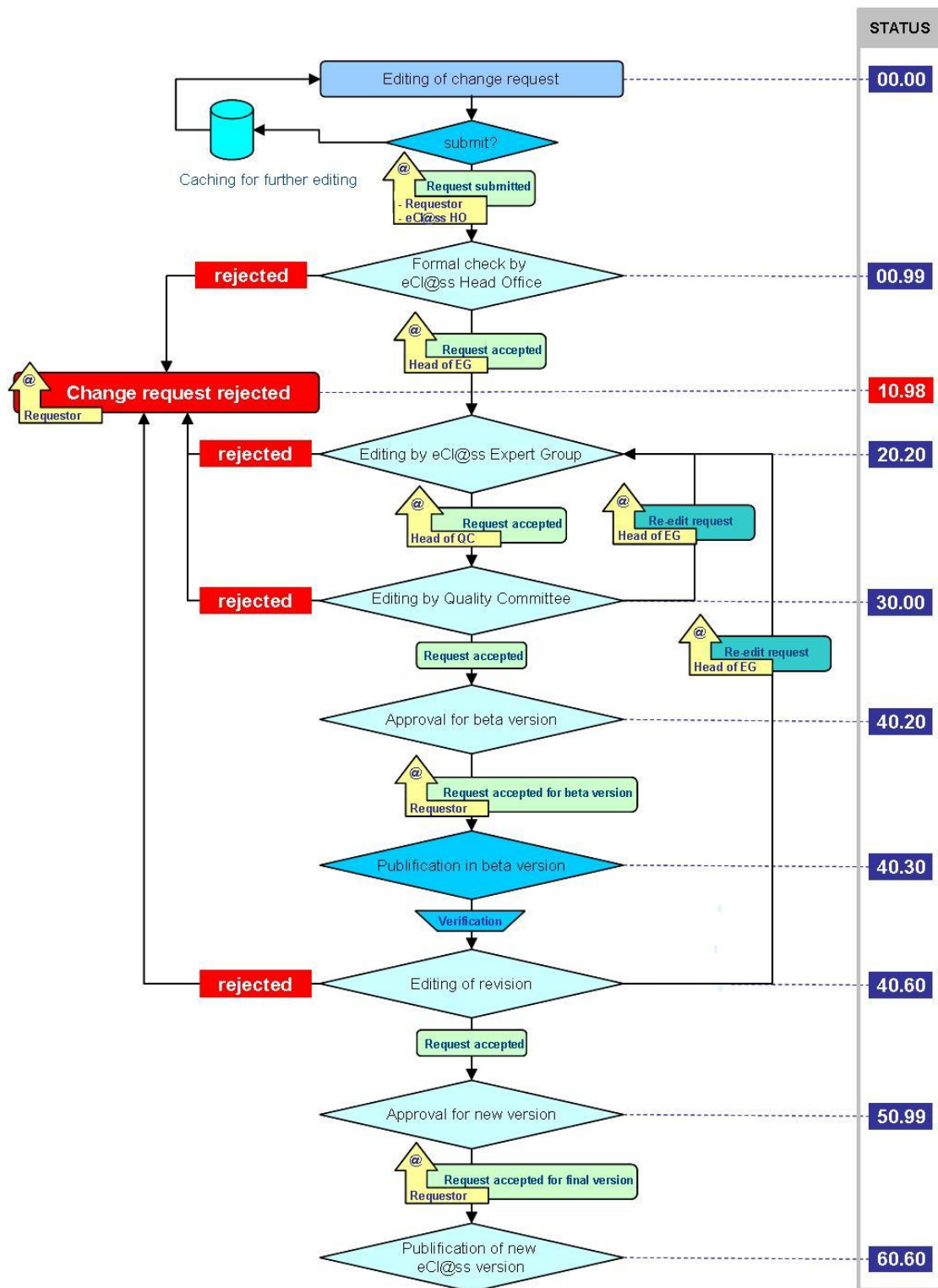
Source: http://wiki.eclass.eu/wiki/The_Release_Process

Publication

eCl@ss Release 7.1 can be downloaded from the eCl@ss Download Portal in two formats: CSV and XML. A fee applies for this download. eCl@ss provides Release Update Files (called "mapping tables) which are also subject to charge.

3. GPC

Release policy and release roadmap

GPC is the mandatory classification standard for GDSN[60]. Therefore, the publication of new GPC releases is aligned with the GDSN Maintenance Releases. GPC uses a "Consolidated Release" strategy to publish the GPC Schema twice per year, once in May and once in November, with defined release roadmaps.

Release Validity

There are two versions available: the most recent version and the version before that used in production in GDSN. However, there is no regulation regarding the use of older versions outside the GDSN user communities.

Version compatibility

Delta reports between two consecutive releases are available for all updates.

Types of change

A change request in GPC can refer to initiating a complex new segment development or deal with ongoing maintenance. The GPC components that can be affected are Hierarchy Structure (Segment, Family, Class and Brick), a Brick, a Brick Attribute, Brick Attribute Value or Documentation.

Change request

Any individual, company or organisation may submit a change request. The online Change Request Form can be accessed through the GSMP website[61].

Maintenance process

The change request process for GPC consists of five steps:
1. Statement of Business Need (what is the intended usage area);
2. Requirements Gathering & Analysis (the change request becomes a work order and the gathering of the business requirements begins. The business requirements are documented and analysed);
3. Business Solution Design (GPC has a centralised governance mechanism and uses the same rule set for every new industry sector);
4. Technical Solution Design – single data model for every segment;
5. eBallot – voting mechanism to migrate to a global standard.

Publication

The GPC standard is downloadable[62] by all companies without usage restrictions. The file formats are:
- The schema in xml, txt and xls;
- Info sheets in doc
- Visual map in xls
- Delta report in xml and xls.

4. UNSPSC

Release Policy and release roadmap

The UNSPSC is updated and released twice a year. The roadmap is flexible and depends mostly on industry and government need.

Release Validity

Any version of UNSPSC is usable.

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[60] GS1 Global Data Synchronisation Network
[61] http://wr.gs1.org/?CFID=38827&CFTOKEN=18070049
[62] http://www.gs1.org/gsmp/kc/gpc

Version compatibility

The new releases are downwards compatible to previous releases. Upward compatibility is guaranteed for the portions of the release that centre on classes added.

Types of change

From one version to the next version, codes can be added, edited, transferred or removed. Occasionally groups of members require that major rework in a segment must be done to sustain industry consensus.

Change request

Individual requests can be made by members through the website.

Maintenance process

There is a three node system to try and ensure maximum quality:

1. Approval: members have the ability to participate in finding a solution. Once consensus is reached, the candidate requests are prepared for vote by the membership;
2. Vote: those requests that pass the vote are collected for a back-end review;
3. Review by a third party: the back end checks that the work and the initial review were carried out correctly.

Publication

The current UNSPSC codeset in PDF format can be downloaded[63] by all users without charge. The version is released in PDF for the general public and in Excel format for members. The Excel version also includes an audit trail that documents changes in the version released.

Summary

Table 26 below shows the main differences between the CPV and the other classification systems. The other classification systems publish new versions much more frequently.

The main reason – apart from the legal aspects - seems to be that the other classification systems have a defined change request process in place. Furthermore, it is easier for users to cope with frequent new releases if they are not forced to make use of the current version (release validity) and if version compatibility is defined and supported with machine-readable documents.

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[63] http://www.unspsc.org/Default.aspx?sid=322830

Table 26: Summary maintenance processes of the four classification systems

Classification	Release Policy	Release Validity	Version compatibility	Maintenance process
CPV	Not defined, generally 1 version every 3-4 years	Only one	No policy applied today	No change request process Informal request system
eCl@ss	1 minor release per year, generally 1 major release every 2-3 years	Any version is usable	Major Releases are not downwards compatible, Minor Releases are downwards compatible within the same Major Release number	Change request process
GPC	2 versions per year	One version in GDSN, any version otherwise	Backward compatibility with delta reports	Change request process
UNSPSC	2 versions per year	Any version is usable	Backward compatibility	Change request process

3.3.2 Results of the online survey

The main objective of the online survey in relation to the maintenance process was to gather user information on the frequency of new CPV versions and the willingness to participate actively in further development of the CPV.

The questions below (Figure 62 and Figure 63) were asked to both contracting authorities and suppliers. The results are representative for the EU.

Figure 62 shows how often the CPV should be updated in the view of the respondents.

Figure 62: Update cycles of the CPV

How often should the CPV be updated in your view?

N = 523 - 3335
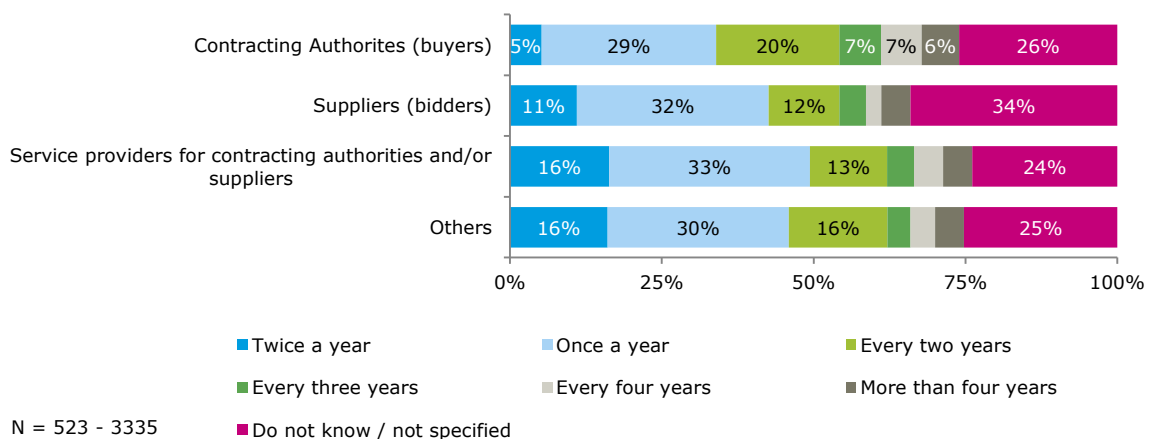
The respondents would like to see significantly shorter release cycles in the CPV than today. Overall, nearly 10% think that the CPV should be updated every four years or more. The single biggest group (around 31%) are those who think that the CPV should be updated once a year.

The Figure below shows that some 23% would participate in the maintenance of the CPV. However, the absolute number of respondents willing to participate is more than 2,000.

Figure 63: Participation in the further maintenance of the CPV

Would you be willing to participate actively in the maintenance and further development of the CPV?

N = 519 - 3322
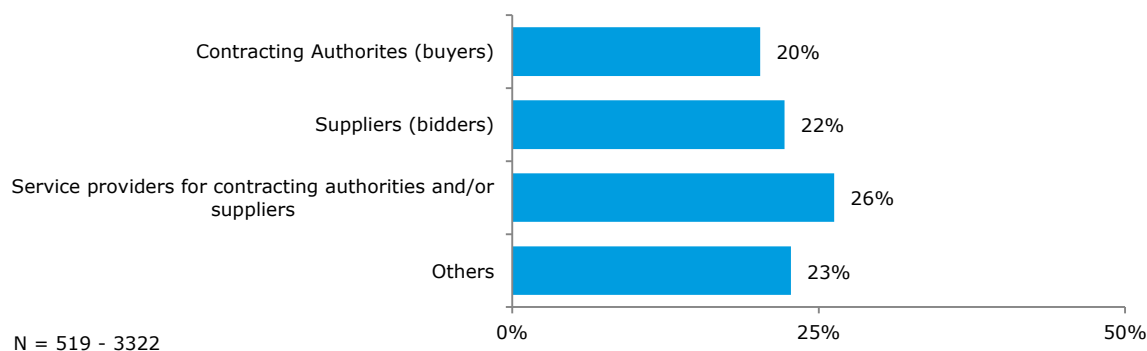
Summary
There are two important findings from the results of the online survey:
- The respondents asked for significantly shorter release cycles in the CPV than today;
- More than 2,000 respondents stated that they are willing to participate in the maintenance of the CPV.

3.3.3 Recommendations for the further maintenance of the CPV

In the section below we describe recommendations for further maintenance of the CPV based on our expert analysis. The recommendations are based on the assessment of the CPV processes against the maintenance schemas of the other three classification systems and on the results of the online survey.

Release policy, release roadmap and type of changes

The comparison of the classification systems and the results of the online survey give a clear picture. The release cycles in CPV should be significantly shorter. Based on this, we make the following recommendations in which we differentiate between major and minor releases.

Major releases include all types of change from just textual changes up to modifications of the structure of the CPV. These major releases are comparable to the existing procedure. Due to the fact that a major release may contain structural changes, it might not be downwards compatible to previous releases. This leads to the recommendation that major releases should be valid for at least three to four years to ensure stability.

Minor releases include all types of changes other than structural. With these kinds of updates it is possible to react to market developments and the need for troubleshooting at short notice. Minor releases have to be downwards compatible within the same Major Release number. This allows automated updates of systems which reduces costs and sources of error. We recommend one minor release every year.

The publication date of both, major and minor releases should be defined in a release roadmap. This would help all users of the CPV, contracting authorities, suppliers, software developers and service providers in moving to a new version.

Further, only one version of the CPV should be valid at any one time. This is a similar construct to that of the GPC. The new release would be published on a specific date defined through the roadmap. This new release is then implemented on TED and valid after a fixed period. Therefore, all users should have enough time to familiarise themselves with the new release on TED.

The following example illustrates the approach:

$t < T_0$ The CPV release implemented and used is version 3.2.

$T_0 + x$ CPV version 3.3 is published. This date is known by all users.

$T_0 + x + y$ From that date on, CPV version 3.3 is used on TED. This date is known by all users.

It should be kept in mind that the CPV is an EU regulation and therefore every change of the CPV has to follow an EU legislative process. This means that even for minor releases there might be a need to initiate a legislative procedure less than once per year. Against this background, it might be necessary to initiate a reflection on the legislative nature of the CPV to allow more flexibility.

Change requests and maintenance process

CWA 16138 recommended to all the classification authorities that they take over a standardised maintenance process, e.g. that proposed in CWA 15295:2005[64]. This process is shown in Figure 64. The eCl@ss maintenance process is based on the recommended process proposed by CWA 15295:2005.

It is our recommendation that proposals be registered online following the example of eCl@ss with its ContentDevelopmentPlatform[65]. The access to such a development platform should be via SIMAP. After a successful formal check of the change request, it would be accepted and opened up to discussion and evaluation.

The discussion and evaluation of the proposal should be carried out by expert groups. The more than 2,000 respondents to the online survey who are willing to participate in the maintenance of the CPV would be a very good basis for forming those expert groups. The integration of professional associations would also be a good instrument for obtaining expertise. The expert groups would also be responsible for editing the change requests. Expert groups could, of course, also create change requests for their dedicated area of interest.

Every edited change request should by checked by a quality committee responsible for compliance with quality guidelines before the final decision is taken as to whether a change request would be accepted and integrated in a future release.

The whole process should be supported by a workflow system. Every registered user should have the opportunity to follow the development process and have a view of the current draft of the new version.

The proposed maintenance process implies two kinds of cost: first, costs for installation and maintenance of the development platform, and second costs for supervision of the maintenance process itself. We assume that there are costs for the development of the CPV today and that the costs for the proposed further maintenance process would correspond approximately to these.

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[64] ftp://ftp.cen.eu/cen/Sectors/List/ICT/CWAs/CWA15295-00-2005-Aug.pdf

[65] http://www.eclass-cdp.com/portal/info.seam?conversationPropagation=none

Figure 64: Suggested ePDC⁶⁶ Maintenance Procedure
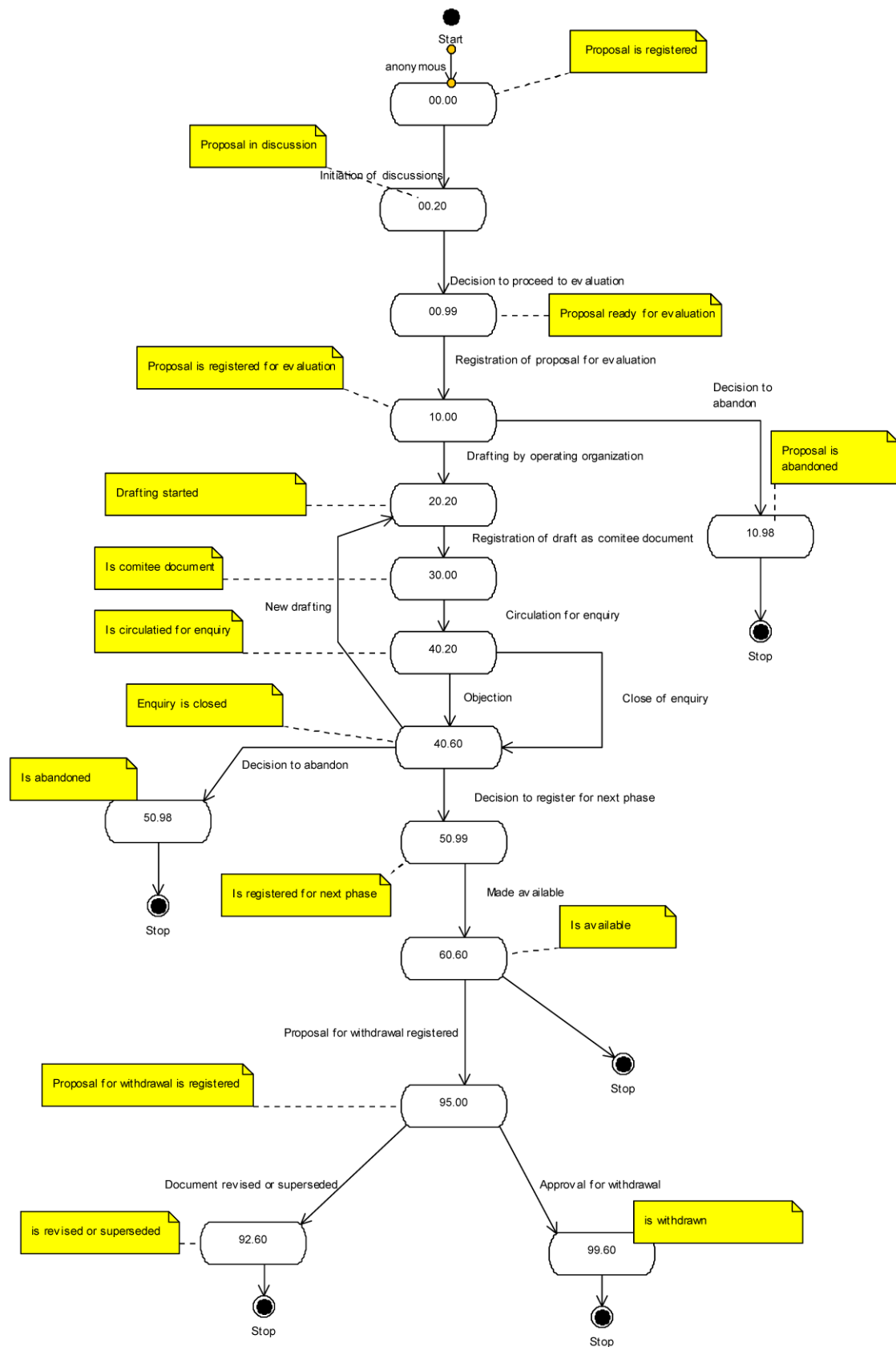
Source: CWA 15295, August 2005, Description of References and Data Models for Classification, page 35

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⁶⁶ Electronic Product Description and Classification

Publication

The common approach of the classification authorities is the publication of additional release update files (mapping tables) within a new release. This is very important to let a machine read the information so that the upgrade to a new release is made easy.

Furthermore, it would be helpful to make update documents for the users available in which the changes are documented.

3.3.4 Summary

The main difference between the CPV and the other classification systems is the absence of a defined release policy. There is only an informal change request system. From the user's point of view, there is a demand for significantly shorter release cycles in the CPV than today and they are willing to participate in the maintenance of the CPV. Once more, it should be kept in mind that the CPV is an EU regulation and therefore every change of the CPV has to follow the EU legislative process.

For the further development of the CPV could establish a release policy with major and minor releases and fixed release dates. Minor releases should be used to react to current market developments.

The maintenance process should be designed according to standardised maintenance processes, such as the one described in Figure 64. The users should be strongly integrated into the formulation of change requests and the development of the latter.

It is essential that release changes be supported with machine readable information to simplify the update process. Therefore, it would be helpful to delete colon and the semicolon in every text field to optimise machine-readable documents and to provide additional release update files (mapping tables) within a new release.

> **Conclusion:** Currently there is no defined release policy for the maintenance of the CPV. We suggest defining a release policy for the CPV which distinguishes between major and minor updates. Users want more frequent updates and are willing to contribute to updates. In the future, the users of the CPV should be involved more in the maintenance of the CPV. Finally, it might be necessary to think about whether a reflection on the legislative nature of the CPV should be initiated to allow more flexibility.

3.4 Summary of recommendations for improving the CPV

Based on our findings we make the following recommendations in regards to scenarios for supporting the functioning of the CPV:

1. The user-friendliness of the search function offered by TED/SIMAP should be improved (cf. section 3.1.5). Furthermore, interactive instruments such as web seminars, a wiki and feedback functionalities could be offered for better guidance (cf. section 3.1.6).

2. There are several possibilities for integrating the CPV in an e-procurement environment. The current CPV could be enhanced, one could collaborate with another classification system or different product classification systems could coexist. Each possibility has advantages and disadvantages (cf. section 3.2.6) and a decision amongst these could be taken.

3. A release policy for the CPV should be defined which distinguishes between major and minor updates. Users should be involved in the maintenance of the CPV in a structured way. Furthermore, a reflection on the legislative nature of the CPV should be initiated to allow more flexibility.

4. METHODOLOGICAL NOTES

The results presented above build on a variety of methods. This chapter contains details of the methodologies applied.

4.1 Analysis of TED notices database

CPV codes are used by contracting authorities when publishing contract notices on TED ("Tenders Electronic Daily"). TED is the single European Union official source of public procurement notices. The aim of TED is to bring contracting authorities and suppliers together. Contracting authorities are legally obliged to publish contract notices for above-threshold procedures on TED using SIMAP.

Contracting authorities can publish tenders through tree channels:
- Registered eSenders provide TED with publications in XML format;
- eNotices: contracting authorities can access special online forms in SIMAP and provide their information through these forms;
- Paper/e-mail: contracting authorities can also send forms by paper or e-mail.

Some 1,500 to 1,700 notices are published each day (contract notices, contract award notices etc.). Around 52% come from eSenders, about 43% are eNotices through SIMAP and the remaining 5% are provided by e-mail or on paper.[67]

All public procurement notices on TED must have a CPV code. Only for some special forms of notices is no CPV code required. Users can search by CPV codes when searching for notices relevant to them.

Data about publication on TED was used to calculate which code is used how often. The aim of this analysis was to identify those codes which appear most relevant (as evidenced by frequent use) and those which may be less relevant for public procurement (rarely used).

The Commission provided data for the analysis covering all procurement notices published on TED in the years 2009, 2010 and 2011. The data contained 495,691 contract notices.

As the CPV is mandatory when publishing on TED, each notice contained at least one CPV code.

Overall, CPV codes can be used in different ways in contract notices:
- One CPV code is the "Main object".
- Several additional codes can be given as "Additional objects" to specify the subject of the notice further.

In addition, one notice can cover several lots. Overall, the 495,691 notices in scope of this analysis contained 1,264,673 lots. CPV codes must also be cited at the level of lots. Thus, the following additional possibilities exist for using CPV codes:
- one CPV code is the "Main object" of the lot, and
- several additional codes can be given as "Additional objects" to specify the subject of the lot further.

The following table shows the number of usages for the 495,691 notices and 1,264,673 lots broken down by the four possibilities for using the CPV mentioned above.

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[67] See also Publications Office "Annual Management Report 2011", page 33, http://bookshop.europa.eu/en/annual-management-report-2011-pbOAAA12001/

Table 27: Usage of CPV codes 2009-2011

Usage	Number of occurrences 2009-2011
At the level of a notice as "Main object"	495,691
At the level of a notice as "Additional object"	458,683
At the level of a lot as "Main object"	1,264,673
At the level of a lot as "Additional object"	768,991
Total	**2,988,038**

Overall, therefore, between 2009 and 2011, contracting authorities applied a CPV code through TED 2,988,038 times. The detailed results by codes can be found in Appendix 1.

As the table above shows "Additional objects" are cited frequently. The analysis of a sample of tender notices showed, that citing "additional objects" is useful for tenders which cover a range of works/supplies/services (cf. section 2.2.4).

Further results of the analysis are presented in sections 2.1.2, 2.1.5 and 2.2.3.

4.2   Review of Commission's own findings

DG MARKT collected questions and answers from contracting authorities and other stakeholders on the CPV. The corresponding e-mails were provided to the consultants and examined. The e-mails have been grouped and evaluated according to the major evaluation questions of this study. The following text presents the findings.

In total, 46 e-mails were analysed dating from 2005 to 2011. During the review, each e-mail was analysed with regard to the evaluation questions as set out in the evaluation matrix of this study. Furthermore, each 'conversation' was categorised in relation to basic parameters such as date, language used or occupational sector of sender. Unfortunately, however, the small sample size did not allow for any generalisations about their content or the parameters defined.

The majority of e-mails were sent by public sector institutions. Most emails were inquiries about how to use the CPV system or how to find a specific CPV code for a tender (some 23 e-mails). In relation to the question "Which types of works/supplies/services codes prove to be useful and which ones do not?" several users found the distinction between works, supplies and services unclear. Furthermore, some users found it difficult to identify the relevant code for their purpose.

It was evident that some codes seem to be not detailed enough for some users. These users had difficulty finding codes that describe their subject accurately and had therefore to use several different codes for one tender to be able to describe the subject.

The maintenance process of CPV was subject of some user-mails: Some users asked for small changes (e.g. wording of codes). However, these cannot be quickly implemented due to the legal nature of the CPV. Overall, it became clear that the current maintenance process is not sufficiently *effective and efficient for single users*. In this context, it was unclear to some users if the codes used in contract notices before 2008 are still valid.

In the view of suppliers, the CPV has *several weaknesses*: first, the CPV does not always help to overcome the language barrier completely as details in tenders remain unclear. The central description of the notice, where interested suppliers can identify the concrete subject of the notice, is only published in the language of the contracting authority. The only way to identify the subject of a tender for international suppliers is the wording of the CPV code, which is available in all official EU languages.

TED in the past offered the possibility of an automated translation of the central description of the notice. However, the automated translation functionality in TED had to be discontinued for copyright reasons. According to the Publications Office it is planned to re-implement this

functionality in the future. Nevertheless, international suppliers can currently identify the subject of a tender only by the wording of the CPV code and could miss details of a tender which are clarified in the central description of the notice.

Furthermore, some existing codes do not fit according to some emails: the concrete tender subject was difficult to identify with the CPV. This is either because contracting authorities used a high level code, which results in a high level description of the notice because of the wording of these codes. Or there was no code available which described the exact nature of the tender or product which needed to be purchased (see for example the product "Body Volume Imaging via a 3D non-invasive body scan").

Finally, some users were offended by the wording of some codes: code 85311200 "Welfare services for the handicapped" and code 85312120 "Daycare services for handicapped children and young people". In this example, the word "handicapped" is perceived to be offensive. "The disabled" is considered more appropriate in English.

It should be kept in mind that this sample of 46 e-mails lacks representativity. Furthermore, users do not usually write e-mails to the Commission if they want to express their satisfaction with the CPV. It may be that the small sample size of 46 e-mails in five years is an indicator of the overall contentment of CPV users – or it may indicate their indifference to CPV.

To summarise, the email-messages analysed are of two types:

Messages on CPV code usage:
- CPV users were unsure which CPV code to use (23 mails);
- Appropriate codes needed by CPV users did not exist (5 mails);
- CPV codes were not translated correctly (2 mails).

Messages concerning the CPV system as a whole:
- The CPV system does not always overcome the language barrier as details in tenders remain unclear (3 mails);
- The CPV system is difficult to update (7 mails);
- The distinction between works, supplies and services is unclear for some users (5 mails).

4.3   Literature review

Scholarly publications and academic literature on topics relating to the CPV were analysed to identify further expert assessment of the functioning of the CPV, especially compared to other classification systems. The key findings of this analysis are presented below.

This research revealed that there is little in the way of scholarly publications and academic literature on topics relating to the CPV. Nevertheless, the academic sources which were identified proved to be valuable for an assessment of the functioning of the CPV. Furthermore, the information extracted from the literature review served as a framework for a proper understanding of the cMap workshop results and prepared the ground for subsequent expert interviews.

The following table lists all sources that were taken into account for the literature research:

Table 28: Sources of literature review

Author	Title	Year
Academic Literature		
Cornelius, P.	„Verstößt eine fehlerhaft klassifizierte öffentliche europaweite Ausschreibung gegen die EU-Regeln zum öffentlichen Auftragswesen und ist damit vergaberechtlich angreifbar?" (˝Does a falsely classified Europe-wide public tender violate EU law on public procurement? Does this make it liable to legal challenges?") In: Information. Wissenschaft & Praxis 2012; 63(2): 87–94[68]	2012
Fiorentino, L.	"Public Procurement and Competition". Paper presented at the International Public Procurement Conference, Rome, 21-23 September 2006. [69]	2006
Kierkegaard, S.M.	"Going, Going, Gone! E-Procurement in the EU" In: International Journal of Computing & Information Science 4(1): 30 – 39.[70]	2006
Leukel, J. and G. Maniatopoulos	"A Comparative Analysis of Product Classification in Public vs Private e-Procurement" In: The Electronic Journal of e-Government 3(4): 201 – 212[71]	2005a
Leukel, J. and G. Maniatopoulos	"Product Classification and Description in Public e-Procurement: Are There Lessons to be Learned From Private e-Procurement?" In: Remenyi, R. (ed): "5th European Conference on e-Government." Academic Conferences Ltd, Reading.[72]	2005b
Luis Polo Paredes, Jose María Álvarez Rodríguez, and Emilio Rubiera Azcona	"Promoting Government Controlled Vocabularies to the Semantic Web: EUROVOC Thesaurus and CPV Product Classification Scheme". Paper presented at the First International Workshop for Semantic Interoperability in the European Digital Library (SIELD), Tenerife, 2 June 2008.[73]	2008
Zuccolotto, S.	"Public Procurement in Europe". Rome: Istituto Poligrafico e Zecca dello Stato.[74]	2004
Studies on behalf of DG MARKT		
European Dynamics SA	Electronic Catalogues in Electronic Public Procurement[75]	2007
Valoris	Interoperability of CPV coding system in Electronic Public Procurement[76]	2003

In total, nine sources were reviewed with a focus on the evaluation questions noted in the evaluation matrix. The following results of the literature review are structured according to the evaluation questions that were answered best by the literature selected. These questions are:

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[68] http://www.degruyter.com/view/j/iwp.2012.63.issue-2/iwp-2012-0002/iwp-2012-0002.xml

[69] http://www.ippa.ws/IPPC2/PROCEEDINGS/Article_34_Florentino.pdf

[70] http://www.tradeinterchange.com.au/Downloadable/e-procurement%20in%20the%20eu.pdf

[71] http://www.ejeg.com/volume3/issue4

[72] http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.64.786&rep=rep1&type=pdf

[73] http://www.josemalvarez.es/web/mypapers/siedl2008.pdf

[74]
http://www.samili.com/form/smb/pension/EU%C0%C7%20%B0%F8%B0%F8%C1%B6%B4%DE%20%B0%FC%B7%C3%20%BE%C8%B3%BB%20%C0%DA%B7%E1.pdf

[75] http://ec.europa.eu/internal_market/publicprocurement/e-procurement/documents/index_en.htm

[76] http://ec.europa.eu/internal_market/publicprocurement/docs/eprocurement/studies/cpv-final-report-2006_en.pdf

- How should the CPV be updated in the future in regard to market developments?
- How could new interactive CPV tools (e.g. online tools) improve the current usability of the CPV?
- What strengths and weaknesses does the CPV have in the view of suppliers?
- Does the CPV facilitate suppliers' ability to identify public procurement opportunities?

With regards to question 1) "How should the CPV be updated in the future in regard to market developments?" the following quote by Leukel & Maniatopoulos (2005a, p. 210) was identified as most applicable:

"CPV's transparency regarding the standardization process is very low."

The context of this quote is a direct comparison of the 2003 CPV system with a different product classification scheme - eCl@ss - which is limited to private e-Procurement. According to Leukel & Maniatopoulos (2005a), the main difference with regards to the standardisation process lies in the fact that the eCl@ass organisation asks "any individual or company to submit change requests" (Leukel & Maniatopoulos: 2005a, p. 210) while the transparency of the CPV standardisation process is judged to be very low.

It is recognised that the 2003 CPV as well as the 2008 CPV did allow users to contact the Commission about the system (as is evident from the e-mail analysis discussed in section 4.2). However, CPV users were never explicitly asked to submit a request to change existing vocabulary as in the eCl@ss system.

While it is understood that CPV and eCl@ss vary widely with regard to their purpose, structure and legal framework. Nevertheless, it would be possible for the CPV system to become more transparent in this regard. (For recommendations for the CPV maintenance process see section 3.3).

Question 2) "How could new interactive CPV tools (e.g. online tools) improve the current usability of the CPV?" was addressed by a quote from a recent paper by Peter Cornelius (2012, p. 92):

"An interactive software tool with the capacity to suggest CPV codes based on the description of the tender would greatly facilitate the work of the contracting authorities and furthermore enhance the overall quality of classifications."[77]

Today some users find it difficult to identify the relevant CPV code for their tender. Cornelius suggests an interactive software tool that would identify the codes most relevant to the public contract in question. Thus, Cornelius does not propose changing the CPV system and also does not comment on its quality. Rather, he proposes an interactive software tool that could propose CPV codes "on the basis of the entered descriptions" (Cornelius: 2012). However, and even if such a software tool were to prove to be not technically, the quote serves as a reminder that a review of the CPV should not only include the logic and nature of codes, but also the way they are implemented (IT systems, support processes, communication, legal frameworks etc.)

For question 3) " What strengths and weaknesses does the CPV have in the view of suppliers?" a quote by European Dynamics (2007, p. 4) was identified:

"Currently, the existence of so many product description and classification schemes generates an interoperability problem, which can be overcome either by the establishment of one, unique scheme that can accommodate the needs of all industries and all purposes, or by the establishment of a mapping/reference framework which can allow the interoperable co-existence of different schemes."

While the use of the CPV system is mandatory above thresholds, other product classification schemes exist that also affect public procurement. Thus, the interoperability challenge of product classification schemes exists not only between the different systems used in public and private

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[77] Own translation.

procurement, but also with regard to the different systems used within public procurement. The "Nomenclature statistique des activités économiques dans la Communauté européenne (NACE)" or the "Central Product Classification (CPC)" are examples of those overlapping systems.

Two possible solutions are proposed for this interoperability problem: establish one unique system or establish a mapping or reference framework that would overcome any interoperability problems. Both solutions come with a drawback: a unique system would either be very complex or not be able to reflect adequately all items relevant to the needs of contracting and supplying parties. Reference frameworks, on the other hand, require constant updates for multiple classification systems and are thus time-consuming and cost-intensive.

The topic is further addressed in section 3.2.

Question 4) "Does the CPV facilitate suppliers' ability to identify public procurement opportunities?" is addressed by Polo, Alvarez, Rubiera (2008, p. 3) – see section 2.2.2.

Despite the paucity of scholarly publications and academic literature on topics relating to the CPV, some valuable insights could be gathered from the desk research on the functioning and context of CPV:

- CPV could integrate users more pro-actively to draw up and update contents;
- In order to facilitate the search for specific codes, CPV could update its search functions;
- Different classification systems create an interoperability problem for users. The structure of the CPV system is not always logically consistent.

4.4 Exploratory expert interviews

In a first round four exploratory expert interviews were conducted. The results of these interviews were used for gaining a first view on the CPV. They served as a starting point for the subsequent project steps, especially the drafting of the online survey (cf. section 4.8) and for developing the scenarios for improving the CPV (cf. chapter 3).

The first interviewee, Christian Galinski, is Director of the International Information Centre for Terminology (InfoTerm) and participated in the cMap workshops. The second interviewee, Peter Cornelius, works as an "information broker" and has published on the CPV system (cf. Table 28 above). Gérard Roulland, who is responsible for information systems for the French states purchasing office of the budget ministry, was interviewed as well. Last, an interview was conducted with experts from the publications office of the European Union (TED). This section presents some key findings of these discussions.

The experts stated that the coverage of CPV codes is very broad and adequate. The CPV seems to be one of the more developed classification systems compared to other classification systems. In addition, the CPV is capable of describing works, supplies and services accurately. However, codes as "other services" or "varia" should be avoided. The codes are also presented as titles in TED notices. Thus, if one of these codes is used, this leads to a meaningless title.

The benefit of the CPV for contracting authorities was assessed as high. According to an estimate of one expert interviewed, the number of correctly coded tenders is only about 90% of all tenders issued. This means that in roughly 10% of all cases publishing authorities apply a code that does not describe the nature of a tender correctly.

There are several reasons why codes might be applied wrongly; e.g. by using the wrong thematic code or use of a code that is at a very high structural level. First, some contracting authorities have very little experience with the CPV. Therefore these contracting authorities make mistakes by not providing the right, adequate code. Second, some contracting authorities do not spend sufficient time searching for specific codes and therefore use a high level code. In the final analysis, a high level code ought not to be in the interest of contracting authorities as this could

result in a high number of unsuitable tenders. Processing these tenders creates unnecessary costs.

One interviewee raised the question as to why the use of CPV is mandatory but not the use of the right code – here, however, it must kept in mind that the "right" use of CPV codes is not clearly defined. It was suggested that the correct use of the CPV could be verified by the authorities and misuse might be subject to legal sanctions.

For suppliers, the benefit of CPV was also assessed as high. Suppliers search for relevant tenders by searching CPV codes – in addition to full text searches.

During the last revision of the CPV, the aim was to take the supplier's perspective into account more. One expert interviewed stated that this was not, however, done consistently enough. The CPV structure does not represent business sectors – which causes inconsistencies for users. Typically, suppliers think in business sectors; publishing authorities think more in product categories. Today, the CPV system is constructed by product. TED has defined business sectors on its website and grouped relevant codes accordingly in order to facilitate access for suppliers to CPV logic. To avoid this interim construction, the highest level of the CPV should in this expert's view be business sectors.

Language barriers still seem to be a difficulty for users. The original text that describes the tender is shown only in the language of the contracting authority; only the code text is shown in other languages. As some contracting authorities tend not to use the codes which are an exact fit, the code text does not always suit the object of a tender. This creates difficulties for foreign suppliers in gaining a complete understanding of a tender. The solution to this would be the use of codes which are an exact fit and the use of multiple codes to describe the subject of the tender better.

It was mentioned in interviews as well that suppliers are sometimes not familiar with the CPV. In general, awareness of CPV and TED functionalities is low according to interviewees. It is therefore a challenge to educate end-users about the CPV. Interviewees stated that the use and benefits of the CPV for doing business with the public sector needs better promotion, especially for SMEs.

Several possible improvements to the system were mentioned in the expert interviews:

1. Attributes
CPV could be amended by "attributes", as a lot of codes only make sense when defined more precisely, e.g. logic of attributes: code "table", attribute "three legs of metal". Today, the supplementary vocabulary meets this criterion – but usage is very low. In the course of this study suitable recommendations will be developed.

2. Synonyms
It could be beneficial for suppliers if they were able to search not only for the names of the CPV codes but also for keywords and synonyms. Today a user needs to know exactly what he is looking for and needs to use the same terms as the CPV to formulate his search. Here, the online search tool described in section 3.1 would be a possible solution.

3. Tender text structure
Tender texts could be more easily accessible for SME if they were written according to structure guidelines (on text length, main mandatory points, bullet point structure).
It should be possible to put tags in the tender text in order to give SME an additional means of identifying relevant tenders.

4. More languages
It was proposed that the CPV should be available in more languages, including regional languages (e.g. Catalan) even if they are not an official EU language.
For translating the CPV some experiences from eCl@ss can be useful. eCl@ss is available in 17 languages including two different variants of Chinese. The lead languages are English and German. Suggestions for new/modified codes (so-called "change requests") need to be provided

in English even when coming from a non-English speaking country. Regional partners are responsible for the translation of codes into the different languages. Previously, an attempt was made to work with translation agencies, but too many mistakes occurred because a good translation requires both language and subject knowledge. Translators are usually not subject experts for the works/supplies/services described by the single codes. For the CPV, the mapping between eCl@ss and CPV could help when translating new codes in the course of a revision of the CPV.

5. Feedback mechanisms (social media approach)
- Users could have the possibility of reporting errors and suggestions immediately within a standard feedback mechanism;
- Users could be able to create content (see Wikipedia)
- Users could suggest entries, categories etc.

6. Experts
CPV may need more expert staff in order to communicate more often and more intensively with end users.

7. Self-learning
Like Google, TED could facilitate the search for users by re-directing wrong or incomplete search inquiries to the correct items. In the end, the system could learn from the user inquiries. The TED search function could propose possible search items to users while typing (see Google).

8. e-learning tools
Some SME might not be familiar with the CPV. e-learning tools, such as a web seminar, would ease the access for these clients to the CPV. Such tools could be used to explain the basic dynamics and issues relating to the CPV.

Overall, for contracting authorities and suppliers, the CPV was perceived as a benefit by the experts interviewed. In addition, the CPV system seems to describe issues accurately and seems to have broad coverage. But it was obvious for the experts interviewed that some contracting authorities and suppliers do not know how to use this system. This results in the use of wrong codes for tenders and missed business opportunities for suppliers. On this basis, a number of recommendations were drafted for improvements mentioned in the interviews.

Interviews with TED eSenders

In a second round four interviews with TED eSenders were conducted. eSenders are private or public institutions that collect contracting notices from different contracting authorities to provide them in XML format to TED.[78] As working with CPV codes is part of eSender's every day work their experiences and assessments are valuable for the overall review of the functioning of the CPV. We approached selected eSenders for an expert interview. The following table provides an overview of the conducted interviews. In each interview the functioning of the current CPV and scenarios for improving the CPV – especially in regards to integrating the CPV in e-procurement environments – were discussed. The results of the interviews are incorporated into chapters 2 and 3.

Table 29: eSenders Interviews

eSender	Countries of activity	Interviewee	Date of interview
SPF P-O Service E-Procurement	Belgium	Mr Christian Henrard	21.11.2012
Millstream Associates Ltd	Scotland, Norway, IrelandReview of the functioning of the CPV Codes/system	Mr Tim Williams	27.11.2012
Visma Opic AB	Sweden, Norway, Denmark	Mrs Asa Fredriksson	27.11.2012

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[78] For a list of the current eSenders see http://simap.europa.eu/ojs_esenders/list_of_ojs_esenders/index_en.htm

| TenderNed | Netherlands | Mr Kornelis Drijfhout | 28.11.2012 |

4.5   Discussion of codes with practitioners

The single CPV codes were discussed in detail with practitioners from the respective subject areas. The discussions were based on an interview guide for the discussions with practitioners.

The CPV codes were grouped into 24 families for the purpose of structuring our work. Each family consists of division with related subjects. All the CPV Code families (except 13) were discussed with in total 30 practitioners from 15 different organisations, c.f. Appendix 5.

The results of the discussions with practitioners are described in chapter 2.

4.6   Analysis of a sample of tender notices

A sample of tender notices was analysed to asses to what extent the CPV codes are accurately used by contracting authorities when publishing contract notices on TED. This considered:
- to what extent contracting authorities chose codes that actually describe the works/supply/service procured, and
- to what extent contracting authorities chose codes that are at the right level of the classification, meaning that the codes chosen are not too general nor too specific .

Given the amount of tender notices available it was necessary to draw up a sample for further analysis. It was calculated that a sample of 380 tender notices of the 112,419 tender notices provided would be sufficient to reach a degree of confidence of 95%. However, to be on the safe side, it was decided to draw up a sample of 405 cases.

Two main sources of possible inaccurate use were expected based on evidence collected previously:
- discussion of codes with practitioners indicated that the CPV is perceived to be best structured for supplies, less good for works and least good for services, so an inverse ratio of inaccuracies was expected;[79]
- where a high level code is chosen it can be supposed that in many cases a more specific code would have been available, so it was expected that there would be more inaccuracies if a code at a high level (less detailed) of the hierarchy is chosen and fewer inaccuracies if codes at a low level (detailed) of the hierarchy are chosen.

In order to be able to test these hypotheses, the sample was designed as a disproportionate stratified sample. Consequently the following criteria were applied for the stratification of the sample:
- Type of contract: works/supplies/services;
- Level of the main CPV code given in the tender notice:
  - High level: Divisions (2-digit level) and groups (3-digit level);
  - Medium level: Classes (4-digit level) and categories (5-digit level);
  - Low level: Subcategories (8-digit level).

The following tables show the number of tender notices in the original population and the number of tender notices in the sample by type of contract and level of code

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[79] However, the analysis showed that in fact the level of incorrect use is highest not for services (as originally presumed) but for works (cf. section 2.2.4).

Table 30: Tender notices - original population

Number of tender notices		Type of contract			Total
		Works	**Supplies**	**Services**	
Level of the main CPV code	**High level** (Divisions and groups)	5,286	6,082	11,979	23,347
	Medium level (Classes and categories)	10,511	13,243	20,196	43,950
	Low level (Sub-categories)	24,520	12,069	8,533	45,122
Total		**40,317**	**31,394**	**40,708**	**112,419**

Table 31: Tender notices - sample

Number of tender notices		Type of contract			Total
		Works	**Supplies**	**Services**	
Level of the main CPV code	**High level** (Divisions and groups)	45	45	45	135
	Medium level (Classes and categories)	45	45	45	135
	Low level (Sub-categories)	45	45	45	135
Total		**135**	**135**	**135**	**405**

Each of the cases sampled was analysed in terms of accuracy of the assigned codes (main CPV and additional CPVs where relevant). The results of this step were then extrapolated to the original population.

The outcomes of the analysis are presented in section 2.2.4.

4.7   Comparison of the CPV with other classification systems

In order to assess the CPV's coverage in comparison to other classification systems, we made use of the CEN cMap project and the CEN CC3P project "Classification and catalogue systems for public and private procurement". The objective of these projects is to generate a mapping of the main four product classification systems (CPV, GPC, eCl@ss and UNSPSC). This section builds on the results of these two projects.

The cMap project "Classification and Mapping for eBusiness and eProcurement" is a follow up project of the CC3P project which was completed in 2010 with CWA (CEN Workshop Agreement) 16138[80]. The CC3P project carried out an analysis of how different product classification systems can be aligned with each other to obtain knowledge about the possibility for mapping or aligning these different systems.

The cMap project extends the results of the CC3P project in two main areas:
• finishing a full mapping of all domains of the four product classification systems;
• defining an architecture and a governance mechanism for a mapping platform in terms of building blocks and its requirements.

The following comments are based on
• the Draft CEN Workshop Agreement on "Classification Mapping for open and standardized product classification usage in eBusiness" (cMap), Draft CWA version 4[81], and
• the CEN Workshop Agreement on "Classification and catalogue systems used in electronic public and private procurement" (CWA 16138).

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[80] ftp://ftp.cen.eu/CEN/Sectors/List/ICT/CWAs/CWA16138.pdf
[81] ftp://ftp.cen.eu/CEN/Sectors/List/ICT/CWAs/cMap_CWA_Public_review.pdf

The cMAP draft document analyses four product classification systems used in eBusiness in Europe (and beyond) for an initial mapping and research in regards of methods, methodologies and platforms.

The CWA 16138 document studies four product classifications used in eBusiness in Europe. Section 5 of CWA 16138 indicates the differences between the four classifications at all levels. Section 6 of CWA 16138 provides recommendations on interoperability of product classifications.

The versions of the product classification systems used here are:
- UNSPSC v11 English
- eCl@ss 6.0.1 English
- GPC 30062008 English
- CPV 2008 English

In this section we provide key information about the history or origin, owner and structure of each classification system.

The comparison of the CPV with the other classification systems was also used to analyse the coverage of the CPV (cf. section 2.2.1), the structure of the CPV (cf. section 2.2.2) and the maintenance process of the CPC (cf. section 3.3).

The classification systems have different application areas and purposes of use:
- The CPV is focused on public procurement in Europe.
- eCl@ss has diverse target groups (procurement, catalogues, logistics, engineering/CAx and spend analysis[82]) and seeks to fulfil the requirements of different markets worldwide. eCl@ss is more common in Europe than in the rest of the world.
- The GPC's main use areas are cross-referencing, data synchronisation, catalogues and procurement. The GPC is used worldwide.
- The UNSPSC has a focus on spend analysis and procurement, and is more common in the USA than in the rest of the world.

CPV

CPV is the Common Procurement Vocabulary. CPV is the only classification system that has to be used for the publication of public procurement notices in the EU. It applies to works, supplies and services. The first version of the CPV was born in 1993. The latest version is CPV 2008.

The CPV consists of a main vocabulary and a supplementary vocabulary.

The main vocabulary is based on a tree structure comprising codes of up to nine digits associated with a wording that describes the works, supplies or services forming the subject of the contract. The CPV consists of a certain hierarchical structure:

- The first two digits constitute the division.
- The third digit constitutes the group
- The fourth digit constitutes the class.
- The fifth digit constitutes the category.
- The sixth digit constitutes finally sub-categories.

Overall 45 divisions, 272 groups, 1,002 classes, 2,379 categories and 5,756 subcategories exist (9,454 codes in total).

The supplementary vocabulary may be used to expand the description of the subject of a contract. The items are made up of an alphanumeric code with a corresponding wording allowing

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[82] Spend analysis is the process of collecting, cleansing, classifying and analysing expenditure data with the purpose of reducing procurement costs, improving efficiency and monitoring compliance. It can also be leveraged in other areas of business such as inventory management, budgeting and planning, and product development. (Wikipedia: http://en.wikipedia.org/wiki/Spend_analysis)

further details to be added regarding the specific nature or destination of the works/supplies/services to be purchased. The alphanumeric code is made up of:
- a first level comprising a letter corresponding to a section,
- a second level comprising a letter corresponding to a group,
- a third level comprising three digits corresponding to subdivisions.
- the last digit serves to verify the previous digits.

eCl@ss

eCl@ss is an international standard for classification and product description. It is a horizontal standard, i.e. cross-segmental; therefore it includes products from different industrial sectors or branches. In 1999, an eCl@ss working group was set up by major German companies (mainly from the chemical industry) and German industrial associations. eCl@ss is an international association based in Germany (eCl@ss e.V.) which was founded in November 2000 and took responsibility for standardising product and service classifications and descriptions. eCl@ss e.V is the owner of the eCl@ss classification system.

eCl@ss is a hierarchical system for grouping materials, products and services according to a logical structure with a level of detail that corresponds to the product-specific properties that can be described using norm-conforming properties. Products and services can be allocated to a four-stage numeric eCl@ss class structure, i.e. they are classified in a hierarchical structure. The eCl@ss data model is designed in such a way that products and services are classified exclusively at the commodity class level (level 4). The classification classes are described with an 8-digit coded name:
- the first two digits identify the segments,
- the second two digits identify the main groups,
- the third two digits identify the groups,
- the fourth two digits identify the commodity classes.

Figure 65: Structure of eCl@ss
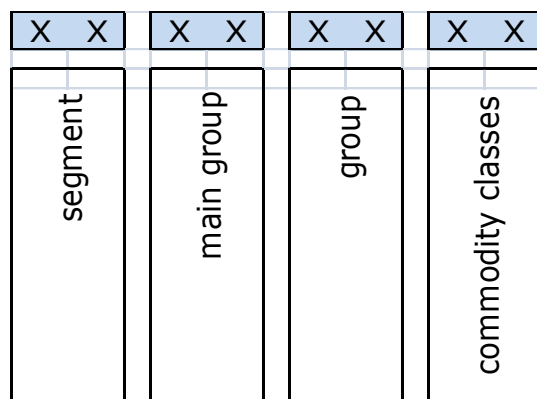
At the fourth level, products and services can be unambiguously described by properties (e.g. material, colour, article number) that are partly standardised by the German National Standardization Institute DIN. The sum of all properties of a subgroup is called a set of properties. A property can have values which determine the most useful characteristics of the property (e.g. property: colour, value: red). The sum of all values of a property is called a set of values. A set of values is open, which means it does not have to be complete.

At each level, keywords are attached to classes to help search for the same product with different possible names used by the market.

GPC

Global Product Classification (GPC) is the chosen GS1 (Global Standards One) standard mandatory classification system for the Global Data Synchronisation Network (GDSN).

In 1999, the board of VICS, the Voluntary Interindustry Commerce Solutions Association, a North American Industry-driven body that develops solutions to improve efficiency and effectiveness in the supply chain, authorized the development of a Product Classification Standard. The same year, the UCC (Uniform Code Council) Board (now GS1 US) approved the Product Classification Project. The two initiatives merged to develop the Food and Beverage classification segment. In 2001, the initiative became global with GS1 accepting governance as a global project.

GS1 (Global Standards One) Global Office is the owner of the GPC classification system. GS1 "is a neutral not-for-profit organisation, which facilitates collaboration amongst trading partners, organisations and technology providers, leveraging standards to ensure visibility along the entire supply chain."[83]

GPC is a hybrid hierarchical system that comprises four levels plus one:
- the first two digits identify the segments,
- the second two digits identify the families,
- the third two digits identify the classes,
- the fourth, lowest and most detailed level of the hierarchy consists of bricks with eight digits preceded by a "1",
- the lowest level in the hierarchy, the brick, has a level beneath it called the brick variant (brick attribute to which brick attribute values are allocated).

Figure 66: Structure of GPC
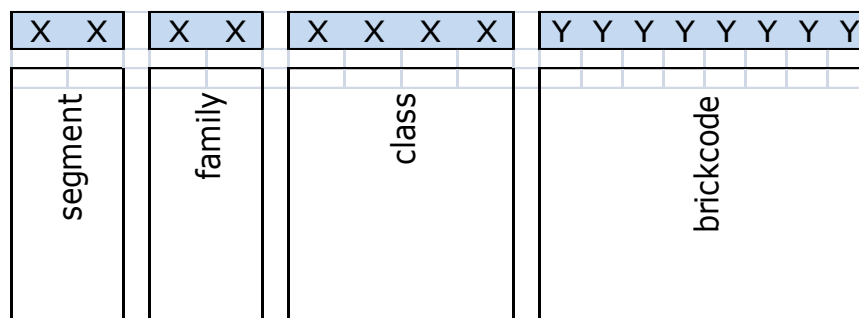
UNSPSC

The United Nations Standard Products and Services Code (UNSPSC) provides an open, global multi-sector standard for classification of products and services.

The UNSPSC was introduced in 1998 by Dun and Bradstreet as the proprietary code set called the SPSC (Standard Product & Services Code). In 1998 it was merged with UNCCS (United Nations Commodity Coding System) of the UNDP (United Nations Development Programme).

The UNDP is the owner of the UNSPSC Classification System. The GS1 GPC is aligned with UNSPSC. The UNSPSC system is maintained by GS1 US as the solution provider.

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[83] Cf. GS1, "The GS1 Supply Chain Visbility Framework", page 16, http://www.gs1.org/docs/GS1_SupplyChainVisibility_WhitePaper.pdf

The UNSPSC is a hierarchical classification with five levels:
- the first two digits identify the segments (XX000000)
- the second two digits identify the families (--XX0000)
- the third two digits identify the classes (----XX00)
- the fourth two digits identify the commodities (------XX)

Figure 67: Structure of UNSPSC
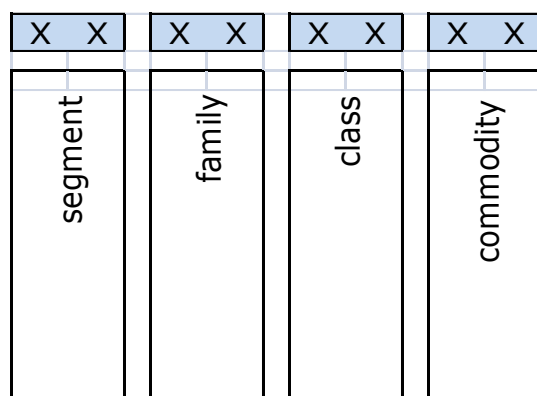
The UNSPSC can be further extended by adding a ninth and tenth digit after the commodity number. These numbers can indicate business relationships to the supplier such as rental/lease, wholesale, retail or original equipment manufacturer (OEM).

4.8   Online survey of users of the CPV

An online survey of users of the CPV was conducted to gather feedback from contracting authorities and bidders.

The questionnaire was developed by Ramboll and BME and contained questions on the usage of the CPV, suggestions for improvements and the usage of product classification systems in the procurement process. The complete questionnaire can be found in Appendix 6. Some questions were filtered by roles in the procurement process to directly address the specific respondent and also to point out the different needs and situations of suppliers (bidders) and contracting authorities (buyers).

The survey was carried out by means of Ramboll's SurveyXact system. This is a web-based system to assist collection, analysis, presentation and distribution of survey data.

The survey was available in five languages (English, French, German, Italian and Polish) in order to achieve a certain geographical variation of the respondents. The survey was not, however, intended to be strictly geographically representative.

The respondents were contacted by two means:

1. By extracting contact details of from the TED data (cf. section 4.1). Contracting authorities' contact details were derived from contract notices. Suppliers' contact details were derived from contracting award notices. These notices contain information on successful tenderers. This made it possible to extract 122,783 e-mail addresses (55,556 contracting authorities and 67,227 bidders). We sent e-mails with an invitation to participate to all potential respondents in early September 2012 followed by a reminder about two weeks later.
2. The Publications Office invited all users registered with TED to participate in the survey.

A total of 12,089 users of the CPV participated in the survey. The number of responses was sufficient to draw statistically representative conclusions on EU level (but not on individual Member States' level).

The following table shows the number of responses received from the two sources by language.

Table 32: Online survey respondents by source and language

Language	Total number of respondents	Responses from users whose e-mail addresses were extracted from notices published on TED	Responses from registered TED users
English	5,322	2,108	3,214
German	3,127	1,121	2,006
French	2,020	1,369	651
Italian	1,071	218	853
Polish	549	257	292
Total	**12,089**	**5,073**	**7,016**

The distribution of the respondents by Member State can be seen in the following table.

Table 33: Online survey respondents by Member State

EU/EEA Member States		Number of respondents
AT	Austria	256
BE	Belgium	284
BG	Bulgaria	73
CY	Cyprus	7
CZ	Czech Republic	65
DE	Germany	2,145
DK	Denmark	207
EE	Estonia	11
ES	Spain	93
FI	Finland	51
FR	France	1,574
GR	Greece	105
HU	Hungary	103
IE	Ireland	84
IS	Iceland	9
IT	Italy	1,070
LI	Liechtenstein	0
LT	Lithuania	31
LU	Luxembourg	59
LV	Latvia	17
MT	Malta	9
NL	Netherlands	248
NO	Norway	33
PL	Poland	552
PT	Portugal	101
RO	Romania	105
SE	Sweden	99
SI	Slovenia	47
SK	Slovakia	35
UK	United Kingdom	1,060
Other/unspecified		3,556
Total		**12,089**

The Figure below provides information on the respondents' role in public procurement.

Figure 68: Role of respondents

What is your role in relation to public procurement?

| 35% | 38% | 22% | 5% |

■ Contracting Authorities (buyers)

■ Suppliers (bidders)

■ Service providers for contracting authorities and/or suppliers

■ Others

N = 12,089
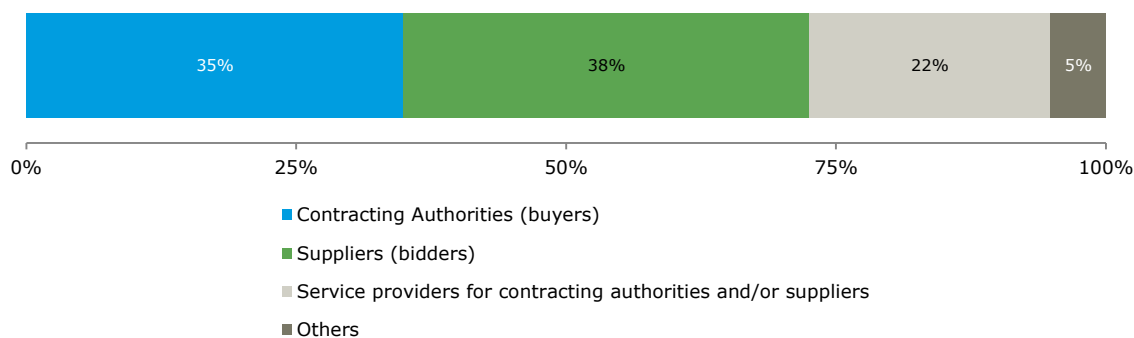
The distribution of respondents by roles in Figure 68 show an even spread between buyers and bidders took part in this survey, and that together these two groups formed the majority of all respondents (73%). Another large group are service providers for contracting authorities and/or suppliers, who accounted for 22% of all respondents.

CPV users were asked how frequently they actually use the system.

Figure 69: Frequency of CPV use

How frequently do you deal with the CPV?

N = 2745
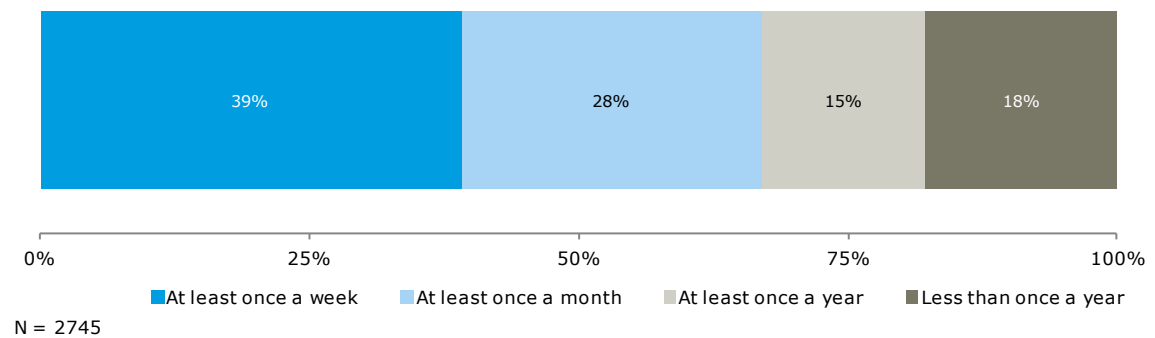
As Figure 69 shows, a large majority deals with the CPV system on a regular basis. 67% use the system at least once a month, of which almost 40% do so at least once a week.

To check the extent of response from SME, bidders were asked to state the number of employees working for their company.

Figure 70: Number of employees per company (bidders)

How many employees work for your company?

N = 2830
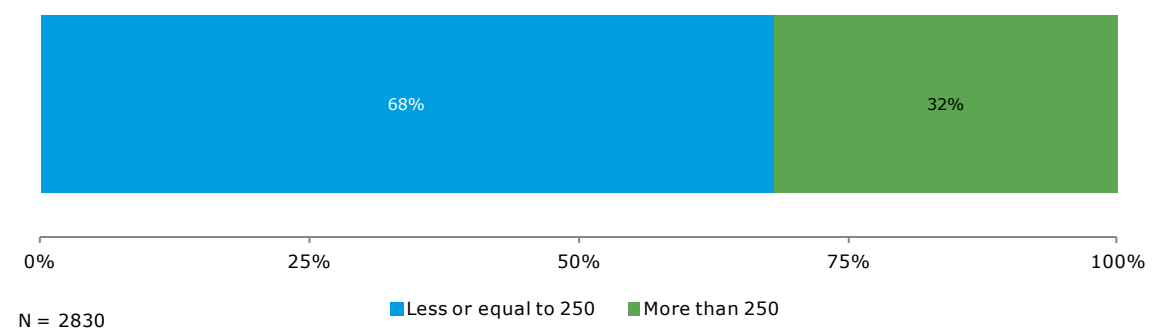
Figure 70 shows that two thirds of all bidders who filled out the survey work for an SME, defined as a company employing 250 employees or fewer. Only 32% of the responding bidders work for companies with more than 250 employees.

APPENDIX 1
CPV CODE USAGE AND ASSESSMENT OF STRUCTURE AND CONTENT

This appendix is provided in a separate file (Excel).

It shows the following information:

1. Sheet "CPV Codes":
    - Columns A to G: List of CPV codes
    - Columns H to L: Usage by Contracting Authorities above EU-thresholds (cf. section 2.1.2)
    - Column M: Usage by Contracting Authorities below EU-thresholds (cf. section 2.1.2)
    - Column N: Usage by suppliers when searching on TED (cf. section 2.1.3)
    - Columns O to X: Codes problematic in relation to structure and/or content (cf. section 2.2.2)

2. Sheet "Supplementary Vocabulary":
    - Columns A to F: List of Supplementary Vocabulary items
    - Columns G to K: Usage by Contracting Authorities above EU-thresholds (cf. section 2.1.2)

APPENDIX 2
LEVEL OF DETAIL OF CPV AND ITS USAGE BY DIVISIONS

The following table (see next page) shows for each division the average level of the structure and the average level of use. The averages refer to the five levels of the CPV:
1. Divisions
2. Groups
3. Classes
4. Categories
5. Subcategories

For more details see section 2.2.3 and Figure 19.

Table 34: Average level of structure and use by divisions

Division		Average level of structure	Average level of use
03	Agricultural, farming, fishing, forestry and related products	4,59	4,04
09	Petroleum products, fuel, electricity and other sources of energy	4,35	3,71
14	Mining, basic metals and related products	4,03	3,57
15	Food, beverages, tobacco and related products	4,55	3,32
16	Agricultural machinery	3,18	2,33
18	Clothing, footwear, luggage articles and accessories	4,15	3,29
19	Leather and textile fabrics, plastic and rubber materials	3,79	2,87
22	Printed matter and related products	3,82	3,12
24	Chemical products	4,54	3,32
30	Office and computing machinery, equipment and supplies except furniture and software packages	4,79	4,18
31	Electrical machinery, apparatus, equipment and consumables; lighting	4,53	3,66
32	Radio, television, communication, telecommunication and related equipment	4,38	3,60
33	Medical equipments, pharmaceuticals and personal care products	4,62	3,87
34	Transport equipment and auxiliary products to transportation	4,56	4,02
35	Security, fire-fighting, police and defence equipment	4,40	3,95
37	Musical instruments, sport goods, games, toys, handicraft, art materials and accessories	4,70	3,58
38	Laboratory, optical and precision equipments (excl. glasses)	4,26	3,25
39	Furniture (incl. office furniture), furnishings, domestic appliances (excl. lighting) and cleaning products	4,59	3,80
41	Collected and purified water	2,25	2,57
42	Industrial machinery	4,58	4,05
43	Machinery for mining, quarrying, construction equipment	4,06	3,36
44	Construction structures and materials; auxiliary products to construction (except electric apparatus)	4,65	4,33
45	Construction work	4,85	4,21
48	Software package and information systems	3,78	2,84
50	Repair and maintenance services	4,26	3,39
51	Installation services (except software)	3,86	3,04
55	Hotel, restaurant and retail trade services	3,31	3,07
60	Transport services (excl. Waste transport)	3,58	2,86
63	Supporting and auxiliary transport services; travel agencies services	4,36	3,61
64	Postal and telecommunications services	4,27	3,35
65	Public utilities	2,82	2,60
66	Financial and insurance services	4,20	4,00
70	Real estate services	3,83	2,85
71	Architectural, construction, engineering and inspection services	4,35	3,49

Division		Average level of structure	Average level of use
72	IT services: consulting, software development, Internet and support	4,44	3,20
73	Research and development services and related consultancy services	3,31	2,18
75	Administration, defence and social security services	4,00	3,67
76	Services related to the oil and gas industry	3,72	2,67
77	Agricultural, forestry, horticultural, aquacultural and apicultural services	3,63	3,71
79	Business services: law, marketing, consulting, recruitment, printing and security	4,04	3,61
80	Education and training services	3,38	2,39
85	Health and social work services	4,46	3,40
90	Sewage, refuse, cleaning and environmental services	4,41	3,63
92	Recreational, cultural and sporting services	4,07	3,24
98	Other community, social and personal services	4,02	3,49

APPENDIX 3
QUANTITATIVE ANALYSIS OF THE STRUCTURE OF THE CPV

This appendix is provided in a separate file (Excel).

The file provides a quantitative analysis of the structure of the CPV.

It uses the information on which code is used how often from the analysis of the TED notices database (cf. section 4.1) and combines this with further indicators.

Columns I to W show for information purposes which codes are used most and least often. The frequency of use is ranked into groups from "1 – very high" to "5 – very low". Column K compares all individual codes, column N only the divisions, column Q only the groups etc.

Columns Y to AO investigate which areas of the CPV should be more or less detailed. The analysis compares for areas of the CPV the frequency of use and the number of elements. Areas which are used relatively often but consist of relatively few codes should be more detailed, whereas areas which are used relatively seldom but consist of a relatively large number of codes should be less detailed.

The comparison is carried out for divisions, groups and classes. The results are shown in column AO. The calculation shows that:
- of the 45 divisions, 3 should be more detailed and 1 should be less detailed;
- of the 272 groups, 11 should be more detailed and 10 should be less detailed;
- of the 1002 classes, 91 should be more detailed and 32 should be less detailed.

Finally, in columns AQ to AS, further areas of the CPV are identified which could be less detailed. Here codes are identified which have inferior codes but where the inferior codes are used less often than their superior code. The usual situation is for inferior codes to be used more often than their superior code. These inferior codes are potentially redundant as the level of detail they provide is apparently not needed in practice.

The calculation shows that
- of the 45 divisions, there are none where the inferior codes are potentially redundant;
- of the 272 groups, the inferior codes of 31 groups are potentially redundant;
- of the 1002 classes, the inferior codes of 154 classes are potentially redundant;
- of the 2379 categories, the inferior codes of 283 categories are potentially redundant.

APPENDIX 4
EVALUATION MATRIX

The evaluation matrix (see following pages) shows the links between the evaluation questions and the methodology.

The rows present the different evaluation questions. The columns present the different tasks of the methodology. The matrix indicates which evaluation question will be answered on the basis of which task(s).

The first set of tables covers Tasks 1 and 2 while the second set of tables covers Task 3.

Table 35: Evaluation matrix - Tasks 1 and 2

Evaluation questions				Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
				Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
				Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
Ex-post: Overall functioning of the CPV as-is?	Does the CPV meets its objectives? I.e.: - Is CPV suited to define the object of the contract in	Does the CPV provide a common basis for formulating procurement needs by contracting	Which codes are most used and which ones are never or very rarely used?			X	x					
			Which types of works/supplies/services codes prove to be useful and which ones do not?	X				x			x	x

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[84] E.g. contracting authorities, Publication Office, public and private providers of tender publications in Member States etc.

[85] E.g. from contracting authorities or business associations

Evaluation questions				Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
				Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
				Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
	public procurement notices? - Is the CPV effective as a means of matching	authorities?	What are the main reasons for high and low usage (e.g. main error sources, accuracy of the coded terms)	X				x			x	x

Evaluation questions			Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
			Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
			Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
	public procurement needs and offer? - Does the CPV enhance efficiency, competition and transparency in EU public procurement markets?	For codes used only rarely or never: What are the causes? E.g. - poor description? - incorrect structure? - work/supply/service not publically procured in practice? - any other reasons?	x				x			x	x

Evaluation questions				Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
				Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
				Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
			Which classification level (4; 6; 8 digit codes etc.) is the most appropriate for each main category of works/supplies/services?	x	x		x	x			x	x
			Would reducing the number of classification levels (e.g. provide only 4 or 6 digit codes) allow simplification while still enabling procurers and suppliers to fulfil same business goals?	x	x			x			x	x

Evaluation questions					Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
					Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
					Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
				Is the coverage complete?	x	x			x		x	x	x
				To which extent are the codes accurate, i.e. the codes identify unequivocally a work/supply/service element with the appropriate precision and are included in the right classification level?	x				x			x	x
				To which extent are the codes accurately being used by contracting authorities?						x			

Evaluation questions				Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
				Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
				Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
			Which categories of works, supplies and service are repeatedly defined with wrong codes? Possible causes: - codes just do not describe the work/supply/service element intended? - codes describe the intended entity but in a either too narrow or too broad way (a higher or lower reference should have made instead)? - any other causes?						x		x	x

Evaluation questions				Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
				Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
				Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
			Does the CPV enable contracting authorities to easily express their public procurement needs?	x				x			x	x
			What strengths and weaknesses does the CPV have in the view of contracting authorities?	x							x	x
	Does the CPV provide a common basis for	Does the CPV facilitate suppliers' ability to identify public procurement opportunities?	x				x			x	x

Evaluation questions				Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
				Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
				Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
		identifying procurement opportunities for suppliers?	What strengths and weaknesses does the CPV have in the view of suppliers?	x							x	x
		Does the CPV foster the cross border element of public procurement?	Does the CPV facilitate cross-border procurement?	x	x			x			x	x
	Are the CPV objectives relevant?	Are procurement needs difficult to express without using CPV?		x				x			x	x
		Are tender opportunities difficult to identify for potential tenderers without using CPV?		x				x			x	x

Evaluation questions			Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
			Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
			Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
	Does the CPV reach its objectives in an effective and efficient manner?	What costs does the CPV generate?	What are the costs of identifying and applying CPV incurred on contracting authorities?								x	x
			What are the costs of identifying and applying CPV incurred on tenderers?								x	x
		What benefits does the CPV	How costly would expressing procuring needs be without using CPV?								x	x

Evaluation questions				Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
				Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
				Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
		generate?	How costly would identifying potential tenders be without using CPV?								x	x
Ex-ante: How can the CPV system, its functioning and its content be improved?	Through which concrete actions and recommendations can the CPV system, its functioning and its content be improved?	Which codes should be deleted, modified or added?		x				x			x	x
		How can the CPV integrate into an e-procurement environment?	For which e-procurement areas is the current CPV not suited and why?	x							x	x
			To what extent can the CPV be used as a works/supplies/services description in e-catalogues?	x							x	x

Evaluation questions				Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
				Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
				Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
			What changes are needed to facilitate the use of the CPV in e-catalogues?	x							x	x
			To which extent could the CPV evolve to become suitable for all e-procurement phases (alone or in combination with other classification methods)? How is the cost-benefit ratio?	x							x	x

Evaluation questions				Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
				Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
				Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
			Should the CPV retain its current scope or should it evolve?	x								x	x
		How to up-date the CPV in regard to market	How effective and efficient is the current maintenance process?	x								x	

Evaluation questions				Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
				Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/specifications	Sub-task 1.3: The coverage and completeness of codes	Explorative experts interviews[84]	Online survey among contracting authorities and successful tenderers
				Review of Commission's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurement	Discussion of codes with BME practitioners and further experts[85]		Comparison of CPV with other classification systems		
		developments?	Which difficulties occur linked to the legal nature of the instrument which make it hard to update or correct material errors?	x							x	
			How should the CPV be updated in the future in regard to market developments?	x							x	
			Should the legal nature of the CPV be changed?	x							x	

Evaluation questions				Task 1: Detailed statistical analysis of current codes and update proposals							Task 2: Gather feedback /concerns from users	
				Sub-task 1.1.: The usefulness of codes and appropriateness of the current subdivision/classification systems					Sub-task 1.2: Analysis of sample of tendering notices/s pecificati ons	Sub-task 1.3: The coverage and complete ness of codes	Explorati ve experts interview s[84]	Online survey among contracti ng authoritie s and successfu l tenderers
				Review of Commissi on's own findings	Further academic literature research	Analysis of TED notices database	Analysis of usage for below-threshold public procurem ent	Discussio n of codes with BME practition ers and further experts[85]		Comparis on of CPV with other classificat ion systems		
		What tools could support the functioning of the CPV?	How could new interactive CPV tools (e.g. online tools) improve the current usability of the CPV?	x							x	
			What are the cost/benefits of a CPV query tool considering both: - a stand-alone service - integrated functionality on TED	x								
		What additional scenarios could improve the CPV system?		x							x	x

Table 36: Evaluation matrix - Task 3

Evaluation questions				Task 3: Expert analysis of CPV future scenarios and recommendations				
				Examination of cMap workshops	Sub-task 3.1: Analyse the capacity of the CPV to integrate into an e-procurement environment	Sub-task 3.2: CPV Maintenance – how to up-date the CPV in regard to market developments	Sub-task 3.3: CPV supporting tools and initiatives	Sub-task 3.4: Propose additional scenarios
					Analysis of e-procurement phases; development and evaluation of scenarios	Benchmark with maintenance processes of other classification systems	Analysis of existing instruments; examine cost-benefit-ratios for two scenarios[86]	Assessment of additional scenarios (tbd)
Ex-post: Overall functioning of the CPV as-is?	Does the CPV meets its objectives? I.e.: - Is CPV suited to define the object of the contract in	Does the CPV provide a common basis for formulating procurement needs by contracting authorities?	(…)					
			Is the coverage complete?	x				

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[86] Stand-alone, integrated in TED

Evaluation questions			Task 3: Expert analysis of CPV future scenarios and recommendations				
			Examination of cMap workshops	Sub-task 3.1: Analyse the capacity of the CPV to integrate into an e-procurement environment	Sub-task 3.2: CPV Maintenance – how to up-date the CPV in regard to market developments	Sub-task 3.3: CPV supporting tools and initiatives	Sub-task 3.4: Propose additional scenarios
				Analysis of e-procurement phases; development and evaluation of scenarios	Benchmark with maintenance processes of other classification systems	Analysis of existing instruments; examine cost-benefit-ratios for two scenarios[86]	Assessment of additional scenarios (tbd)
public procurement notices? - Is the CPV effective as a means of matching public procurement needs and offer? - Does the CPV enhance efficiency, competition and transparency in EU public procurement markets?	Does the CPV provide a common basis for identifying procurement opportunities for suppliers?	(…)					
	Does the CPV foster the cross border element of public procurement?						
Are the CPV objectives	Are procurement needs difficult to express without using CPV?						

Evaluation questions			Task 3: Expert analysis of CPV future scenarios and recommendations				
			Examination of cMap workshops	Sub-task 3.1: Analyse the capacity of the CPV to integrate into an e-procurement environment	Sub-task 3.2: CPV Maintenance – how to up-date the CPV in regard to market developments	Sub-task 3.3: CPV supporting tools and initiatives	Sub-task 3.4: Propose additional scenarios
				Analysis of e-procurement phases; development and evaluation of scenarios	Benchmark with maintenance processes of other classification systems	Analysis of existing instruments; examine cost-benefit-ratios for two scenarios[86]	Assessment of additional scenarios (tbd)
	relevant?	Are tender opportunities difficult to identify for potential tenderers without using CPV?					
	Does the CPV reach its objectives in an effective and efficient manner?	What costs does the CPV generate?	(…)				
		What benefits does the CPV generate?					
Ex-ante: How can the CPV system, its functioning and its content be	Through which concrete actions and recommendations can the CPV system, its	Which codes should be deleted, modified or added?					
		How can the CPV integrate into an e-procurement	For which e-procurement areas is the current CPV not suited and why?	x	x			

Evaluation questions				Task 3: Expert analysis of CPV future scenarios and recommendations				
				Examination of cMap workshops	Sub-task 3.1: Analyse the capacity of the CPV to integrate into an e-procurement environment	Sub-task 3.2: CPV Maintenance – how to up-date the CPV in regard to market developments	Sub-task 3.3: CPV supporting tools and initiatives	Sub-task 3.4: Propose additional scenarios
					Analysis of e-procurement phases; development and evaluation of scenarios	Benchmark with maintenance processes of other classification systems	Analysis of existing instruments; examine cost-benefit-ratios for two scenarios[86]	Assessment of additional scenarios (tbd)
improved?	functioning and its content be improved?	environment?	To what extent can the CPV be used as a works/supplies/services description in e-catalogues?	x	x			
			What changes are needed to facilitate the use of the CPV in e-catalogues?	x	x			
			To which extent could the CPV evolve to become suitable for all e-procurement phases (alone or in combination with other classification methods)? How is the cost-benefit ratio?	x	x			
			Should the CPV retain its current scope or should it evolve?	x	x			

Evaluation questions			Task 3: Expert analysis of CPV future scenarios and recommendations				
			Examination of cMap workshops	Sub-task 3.1: Analyse the capacity of the CPV to integrate into an e-procurement environment	Sub-task 3.2: CPV Maintenance – how to up-date the CPV in regard to market developments	Sub-task 3.3: CPV supporting tools and initiatives	Sub-task 3.4: Propose additional scenarios
				Analysis of e-procurement phases; development and evaluation of scenarios	Benchmark with maintenance processes of other classification systems	Analysis of existing instruments; examine cost-benefit-ratios for two scenarios[86]	Assessment of additional scenarios (tbd)
		How to up-date the CPV in regard to market developments?	How effective and efficient is the current maintenance process?	x		x	
			Which difficulties occur linked to the legal nature of the instrument which make it hard to update or correct material errors?	x		x	
			How should the CPV be updated in the future in regard to market developments?	x		x	
			Should the legal nature of the CPV be changed?	x		x	

Evaluation questions				Task 3: Expert analysis of CPV future scenarios and recommendations				
				Examination of cMap workshops	Sub-task 3.1: Analyse the capacity of the CPV to integrate into an e-procurement environment	Sub-task 3.2: CPV Maintenance – how to up-date the CPV in regard to market developments	Sub-task 3.3: CPV supporting tools and initiatives	Sub-task 3.4: Propose additional scenarios
					Analysis of e-procurement phases; development and evaluation of scenarios	Benchmark with maintenance processes of other classification systems	Analysis of existing instruments; examine cost-benefit-ratios for two scenarios[86]	Assessment of additional scenarios (tbd)
		What tools could support the functioning of the CPV?	How could new interactive CPV tools (e.g. online tools) improve the current usability of the CPV?				x	
			What are the cost/benefits of a CPV query tool considering both: - a stand-alone service - integrated functionality on TED				x	
		What additional scenarios could improve the CPV system?		x	x			x

APPENDIX 5
LIST OF PRACTICIONERS WITH WHOM THE CPV CODES WERE DISCUSSED

The following table provides an overview of the discussions held with practitioners (cf. section 4.5).

Table 37: Practitioners

Family	Division	Name	Expert (Organisation)	Acronym
1	03	Agricultural, farming, fishing, forestry and related products	Deutsche Gesellschaft für Internationale Zusammenarbeit	GIZ
1	16	Agricultural machinery	Deutsche Gesellschaft für Internationale Zusammenarbeit	GIZ
1	77	Agricultural, forestry, horticultural, aquacultural and apicultural services	Deutsche Gesellschaft für Internationale Zusammenarbeit	GIZ
1	77	Agricultural, forestry, horticultural, aquacultural and apicultural services	Deutsche Rentenversicherung Bund	DRV Bund
2	24	Chemical products	Deutsches Zentrum für Luft- und Raumfahrt	DLR
2	09	Petroleum products, fuel, electricity and other sources of energy	N-Ergie AG Nürnberg	NER
2	09	Petroleum products, fuel, electricity and other sources of energy	Deutsche Rentenversicherung Bund	DRV Bund
2	09	Petroleum products, fuel, electricity and other sources of energy	BME expert	BME
2	76	Services related to the oil and gas industry	BME expert	BME
3	14	Mining, basic metals and related products	Deutsches Zentrum für Luft- und Raumfahrt	DLR
3	14	Mining, basic metals and related products	BME expert	BME
3	43	Machinery for mining, quarrying, construction equipment	Deutsche Gesellschaft für Internationale Zusammenarbeit	GIZ
3	43	Machinery for mining, quarrying, construction equipment	Beschaffungsamt BMI	BeschA
3	43	Machinery for mining, quarrying, construction equipment	N-Ergie AG Nürnberg	NER
4	15	Food, beverages, tobacco and related products	Deutsche Gesellschaft für Internationale Zusammenarbeit	GIZ
5	18	Clothing, footwear, luggage articles and accessories	Polizei Hessen	PTLV
5	19	Leather and textile fabrics, plastic and rubber materials	Polizei Hessen	PTLV
6	50	Repair and maintenance services	Beschaffungsamt BMI	BeschA
6	50	Repair and maintenance services	Polizei Hessen	PTLV
7	32	Radio, television, communication, telecommunication and related equipment	Zweites Deutsches Fernsehen	ZDF
7	32	Radio, television, communication, telecommunication and related equipment	Beschaffungsamt BMI	BeschA

Family	Division	Name	Expert (Organisation)	Acronym
8	48	Software package and information systems	Zweites Deutsches Fernsehen	ZDF
8	48	Software package and information systems	Beschaffungsamt BMI	BeschA
8	48	Software package and information systems	Polizei Hessen	PTLV
8	72	IT services: consulting, software development, Internet and support	Beschaffungsamt BMI	BeschA
9	30	Office and computing machinery, equipment and supplies except furniture and software packages	Beschaffungsamt BMI	BeschA
9	30	Office and computing machinery, equipment and supplies except furniture and software packages	Deutsche Rentenversicherung Bund	DRV Bund
9	22	Printed matter and related products	Deutsche Rentenversicherung Bund	DRV Bund
10	31	Electrical machinery, apparatus, equipment and consumables; lighting	Deutsches Zentrum für Luft- und Raumfahrt	DLR
10	31	Electrical machinery, apparatus, equipment and consumables; lighting	Beschaffungsamt BMI	BeschA
10	31	Electrical machinery, apparatus, equipment and consumables; lighting	N-Ergie AG Nürnberg	NER
11	33	Medical equipments, pharmaceuticals and personal care products	Deutsche Rentenversicherung Bund	DRV Bund
11	33	Medical equipments, pharmaceuticals and personal care products	Universitätsklinikum Münster	UKMS
11	33	Medical equipments, pharmaceuticals and personal care products	Universitätsklinikum Heidelberg	UKHD
11	33	Medical equipments, pharmaceuticals and personal care products	Landschaftsverband Rheinland	LVR
12	34	Transport equipment and auxiliary products to transportation	Beschaffungsamt BMI	BeschA
12	34	Transport equipment and auxiliary products to transportation	Polizei Hessen	PTLV
12	34	Transport equipment and auxiliary products to transportation	Deutsche Rentenversicherung Bund	DRV Bund
12	60	Transport services (excl. waste transport)	Landschaftsverband Rheinland	LVR

Family	Division	Name	Expert (Organisation)	Acronym
14	38	Laboratory, optical and precision equipments (excl. glasses)	Deutsches Zentrum für Luft- und Raumfahrt	DLR
14	38	Laboratory, optical and precision equipments (excl. glasses)	Universitätsklinikum Münster	UKMS
15	39	Furniture (incl. office furniture), furnishings, domestic appliances (excl. lighting) and cleaning products	Beschaffungsamt BMI	BeschA
15	39	Furniture (incl. office furniture), furnishings, domestic appliances (excl. lighting) and cleaning products	Deutsche Rentenversicherung Bund	DRV Bund
15	39	Furniture (incl. office furniture), furnishings, domestic appliances (excl. lighting) and cleaning products	Zweites Deutsches Fernsehen	ZDF
15	39	Furniture (incl. office furniture), furnishings, domestic appliances (excl. lighting) and cleaning products	Landschaftsverband Rheinland	LVR
16	42	Industrial machinery	Deutsches Zentrum für Luft- und Raumfahrt	DLR
16	42	Industrial machinery	Beschaffungsamt BMI	BeschA
16	42	Industrial machinery	N-Ergie AG Nürnberg	NER
17	44	Construction structures and materials; auxiliary products to construction (except electric apparatus)	Deutsches Zentrum für Luft- und Raumfahrt	DLR
17	44	Construction structures and materials; auxiliary products to construction (except electric apparatus)	MVV Energie AG	MVV
17	44	Construction structures and materials; auxiliary products to construction (except electric apparatus)	Beschaffungsamt BMI	BeschA
17	44	Construction structures and materials; auxiliary products to construction (except electric apparatus)	N-Ergie AG Nürnberg	NER
18	45	Construction work	Deutsches Zentrum für Luft- und Raumfahrt	DLR
18	45	Construction work	MVV Energie AG	MVV
18	45	Construction work	N-Ergie AG Nürnberg	NER
19	51	Installation services (except software)	Deutsches Zentrum für Luft- und Raumfahrt	DLR
19	71	Architectural, construction, engineering and inspection services	Deutsches Zentrum für Luft- und Raumfahrt	DLR

Family	Division	Name	Expert (Organisation)	Acronym
19	71	Architectural, construction, engineering and inspection services	MVV Energie AG	MVV
19	71	Architectural, construction, engineering and inspection services	Beschaffungsamt BMI	BeschA
20	65	Public utilities	Hamburg Wasser	HHW
20	65	Public utilities	BME expert	BME
20	41	Collected and purified water	Hamburg Wasser	HHW
20	90	Sewage, refuse, cleaning and environmental services	Berliner Stadtreinigungsbetriebe	BSR
20	90	Sewage, refuse, cleaning and environmental services	Deutsche Rentenversicherung Bund	DRV Bund
	90	Sewage, refuse, cleaning and environmental services	Hamburg Wasser	HHW
21	66	Financial and insurance services	Deutsche Rentenversicherung Bund	DRV Bund
21	64	Postal and telecommunications services	Deutsche Rentenversicherung Bund	DRV Bund
21	55	Hotel, restaurant and retail trade services	Beschaffungsamt BMI	BeschA
22	80	Education and training services	Landschaftsverband Rheinland	LVR
22	85	Health and social work services	Landschaftsverband Rheinland	LVR
22	92	Recreational, cultural and sporting services	Deutsche Rentenversicherung Bund	DRV Bund
22	98	Other community, social and personal services	Deutsche Rentenversicherung Bund	DRV Bund
22	98	Other community, social and personal services	Beschaffungsamt BMI	BeschA
23	79	Business services: law, marketing, consulting, recruitment, printing and security	Beschaffungsamt BMI	BeschA
23	79	Business services: law, marketing, consulting, recruitment, printing and security	Deutsche Rentenversicherung Bund	DRV Bund
23	73	Research and development services and related consultancy services	Beschaffungsamt BMI	BeschA
23	73	Research and development services and related consultancy services	Zweites Deutsches Fernsehen	ZDF
23	75	Administration, defence and social security services	Beschaffungsamt BMI	BeschA
23	75	Administration, defence and social security services	Deutsche Rentenversicherung Bund	DRV Bund
24	35	Security, fire-fighting, police and defence equipment	Polizei Hessen	PTLV
24	35	Security, fire-fighting, police and defence equipment	Beschaffungsamt BMI	BeschA

APPENDIX 6
QUESTIONNAIRE FOR ONLINE SURVEY OF CPV USERS

This appendix is provided in a separate file.