INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS

Geneva

WORKING GROUP FOR THE DEVELOPMENT OF A UPOV DENOMINATION SIMILARITY SEARCH TOOL

Third Session
Geneva, October 2, 2015

TEST STUDY AND POSSIBLE USE OF A UPOV DENOMINATION SIMILARITY SEARCH TOOL WITHIN UPOV

prepared by the Office of the Union

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EXECUTIVE SUMMARY

1.   The purpose of this document is to propose the next step in the Test Study.

2.   The following abbreviations are used in this document:

CAJ:	Administrative and Legal Committee
CAJ-AG:	Administrative and Legal Committee Advisory Group
TC:	Technical Committee
WG-DST:	Working Group for Variety Denomination Search Tool

BACKGROUND

3.   The background to this matter is provided in document CAJ/71/3 "Variety denominations".

4.   The WG-DST, at its second meeting, held in Geneva, on June 9, 2015, received a presentation by Mr. Glenn Mac Stravic, Head, Brand Database Section, Global Databases Service, on the intermediate results of the Test Study.   A copy of the presentation is contained in document UPOV/WG-DST/2/4 "Intermediate Report of the WG-DST Test Study" (see document UPOV/WG-DST/2/6 "Report", paragraph 4).

5.   The Test Study identified the 11 best algorithms out of 15 which, after initial testing, performed better than all existing tools as measured by F3[1]. The F3 measure had been chosen because recall was assumed to be of higher importance than precision (see document UPOV/WG-DST/2/6 "Report", paragraph 5).

6.   The selected algorithms had been used to form 2,047 different combinations, and each of the combinations had been tested with 100 different "cutoff values"[2] (total of 204,700 settings). The top 10 settings that showed the best performance among all the tested settings measured by F3 were shown in the presentation (see document UPOV/WG-DST/2/6 "Report", paragraph 6).

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[1] $F3 = (1 + 3 \times 3) \times (\text{precision} \times \text{recall})/(3 \times 3 \times \text{precision} + \text{recall})$

[2]   The size of difference between a denomination and the test denomination calculated by an algorithm is called the similarity index. Cutoff value is the threshold of similarity index to determine whether the denomination is regarded as not so similar to the test denomination to the extent that it would require further, individual consideration before deciding if the denomination was (sufficiently) different from existing denominations (see Article 20(2) of the 1991 Act and Article 13(2) of the 1978 Act and 1961 Convention).

7.   The WG-DST agreed on using the F3 measure as a suitable basis for assessing performance because of the importance of recall for denomination similarity search purposes (see document UPOV/WG-DST/2/6 "Report", paragraph 7).

8.   The WG-DST agreed that the second step of the Test Study should be to consider whether to add an additional layer of phonetic criteria to the potential algorithms, by assessing if it would improve performance. In particular, it was agreed that it would be necessary to assess if precision would be sacrificed (see document UPOV/WG-DST/2/6 "Report", paragraph 8).

9.   The WG-DST agreed to prepare two or three algorithms with a phonetic layer and to compare the results to the algorithms without a phonetic layer. It was further agreed that the second step of the Test Study should be done on the PLUTO database using a dedicated test site. The WG-DST proposed to invite CAJ members and observers to participate in the second step of the Test Study, subject to consultation with the Chair of the CAJ (see document UPOV/WG-DST/2/6 "Report", paragraph 9).

10.   The WG-DST agreed that the set of algorithms for the test should be available by September 1, 2015 at the latest, and the result to be reported to the WG-DST, at is third meeting, to be held in Geneva, on October 2, 2015 (see document UPOV/WG-DST/2/6 "Report", paragraph 10).

11.   In response to a request from the Community Plant Variety Office of the European Union (CPVO) to test the set of algorithms on its own system, the WG-DST agreed that the source code of the set of algorithms written in JAVA would be made available, on request, to WG-DST members (see document UPOV/WG-DST/2/6 "Report", paragraph 11).

DEVELOPMENTS SINCE THE SECOND WG-DST MEETING

12.   During the process to prepare the selected algorithms with a phonetic layer, it was found that the selected algorithms showed substantially lower performance when applied to the PLUTO database. In particular, the algorithms produced too many denominations that were above the cut-off value[2] for similarity (low precision).

13.   The reason for the low precision is that the number of non-similar denominations identified in the first step of the test study was too small and the types of non-similar denominations were too narrow in diversity.

PROPOSED NEXT STEPS

14.   As a revised second step, in order to improve the precision of the selected algorithm(s), it is proposed to run the selected algorithms on the PLUTO database with the 20 test denominations used in the first test study and to produce lists of the denominations above the cut-off value. Members of the Union would then be invited to identify denominations above the cut-off values that were not so similar that they would require further, individual consideration before deciding if they were (sufficiently) different from existing denominations (see Article 20(2)[3] of the 1991 Act and Article 13(2)[4] of the 1978 Act).

15.   The above exercise, if completed by a sufficiently large number of experts, would establish a reliable "base truth" set of data. That data would then be used to refine the selected algorithm(s).

16.   Furthermore, it has been concluded from observation of the results obtained from the test study that the best algorithms selected by recombination of standard search algorithms could be significantly improved by customization. Such a step would be most effective if done by a specialist. Given the long-term benefits of developing the most effective search tool possible, it is proposed that the Office of the Union seek to

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[3]   Article 20(2) of the 1991 Act "[Characteristics of the denomination] The denomination must enable the variety to be identified. It may not consist solely of figures except where this is an established practice for designating varieties. It must not be liable to mislead or to cause confusion concerning the characteristics, value or identity of the variety or the identity of the breeder. In particular, it must be different from every denomination which designates, in the territory of any Contracting Party, an existing variety of the same plant species or of a closely related species."

[4]   Article 13(2) of the 1978 Act "The denomination must enable the variety to be identified. It may not consist solely of figures except where this is an established practice for designating varieties. It must not be liable to mislead or to cause confusion concerning the characteristics, value or identity of the variety or the identity of the breeder. In particular, it must be different from every denomination which designates, in any member State of the Union, an existing variety of the same botanical species or of a closely related species."

develop a customized algorithm as a further step, once the base truth data has been established and the algorithm refined.

17.   The timetable for the above exercise would be as follows:

(a)   Issue a circular to invite CAJ representations of the members of the Union inviting them to participate in the second step of the Test Study by October 6 with a deadline of November 4;
(b)   Produce a refined algorithm by December 2; and
(c)   Produce a customized algorithm by December 31, 2015.

18.   Subject to agreement of the above approach, it is proposed that the fourth meeting of the WG-DST, at which a customized denomination similarity search tool would be presented for consideration, would be organized in February, 2016, on a date to be fixed by the WG-DST at its third meeting.

19.   The WG-DST is invited to consider the proposed next steps as set out in paragraphs 14 to 17.

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