

6 LanGuide Content Manager: Web-Based Platform to Support LSP Learning Content

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In this chapter we present the LanGuide Content Management System. It has been designed and developed as a Web-based application and it is aimed at linguists who want to create exercises in different languages, fields and levels for learning purposes. This software application offers a wide variety of different types of exercises according to the common methodology and exercise template defined in the LanGuide project. In addition, it is complemented with a common repository of resources to store and share complementary materials for the exercises, such as videos, texts, audio files and pictures. The tool allows the management of both authors and exercises with different filters to ease searches. In addition, it includes a preview function which allows linguists to check the resulting exercise created and simulate its behavior to check inconsistencies before its final publication. We also present the assessment of the tool with real users which proves its usefulness within the LanGuide project.

Keywords: Content management system, Web-based tool, LanGuide resources repository

Introduction

One of the outputs of the LanGuide project was the preparation of digital technology and a mobile app to put the language guidance tool into a frame of up-to-date digital technologies for language guidance and language acquisition. At present, a similar tool which can give the users an insight into their knowledge plus the guidance on how to improve their knowledge and, in addition, completely free of charge, is not currently available. Thus, one

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of the main goals of the LanGuide project is to develop a set of software applications that will be freely available on the web site of the project.

This chapter presents the LanGuide Content Manager, a Web-based application developed to allow linguists and experts in language teaching to create exercises and activities in different languages allowing LSP learning, according to the methodology defined in the LanGuide project. In addition, the Content Manager includes a repository of resources – such as pictures, videos and audio files – generated by the authors, that can be used by any author to be integrated in the design of the exercises.

During the development of the Content Manager, it has been taken into account that the collection of exercises created by linguists will have to be displayed in the mobile application developed in the project to be finally performed by the target end users of the app, who are students, teachers and administrative staff. Communication between the Content Manager and the mobile app is supported through the corresponding API and a robust and reliable client-server architecture, as described further on in the chapter. The system was initially deployed on the free online *Heroku* server. Currently, the project is deployed on a new and definitive server, hosted in and managed by the University of Primorska, as coordinators of the LanGuide project.¹

The Content Manager has been assessed twice by the linguists who have used it to create exercises in different languages. The feedback received in the first assessment has allowed us to improve the system and fix some bugs, thus obtaining an improved version which was assessed again to proof its validity as a robust Content Management System.

LanGuide Content Manager Architecture and Technologies

In this section we describe the client-server architecture used for the implementation of the Content Manager, indicating the different technologies used both for the front end and the back end, as shown in Figure 6.1.

Front End and Back End Implementation

The front end has been developed using *Pug Template Language*, which is a very powerful tool to create templates in a uniform and robust manner (Hibbard, 2019).

We have used *Node.js* for the development of the whole back end and the corresponding API to communicate with the mobile app. *Node.js* is an

¹ <https://cm.languide.si>.

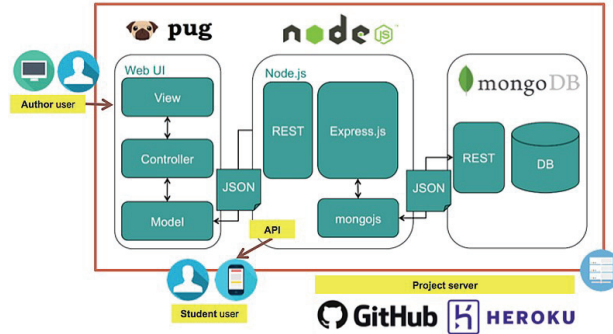


Figure 6.1
LanGuide Content
Manager Architecture
and Technologies

open-source, cross-platform, back-end JavaScript runtime environment that executes JavaScript code outside a web browser (Orsini, 2013). Node.js lets developers use JavaScript to write command line tools and for server-side scripting—running scripts server-side to produce dynamic web page content before the page is sent to the user’s web browser. Consequently, Node.js represents a ‘JavaScript everywhere’ paradigm (Scott, 2020) unifying web-application development around a single programming language, rather than different languages for server-side and client-side scripts.

Database Implementation

The database of the Content Manager has been implemented in MongoDB, a NOSQL database system (Bradshaw et al., 2019). It is hosted online at MongoDB Atlas to facilitate the deployment of the project and its management over the Internet.

LanGuide Content Manager Appearance and Functionality

This section presents the appearance and functionality of the Content Manager as it is in its final version, after performing some iterations for improvements and extensions.

Accessing the Content Manager

Access to the Content Manager is restricted to linguists or experts in language teaching who should previously have been registered into the system by the system administrator. The current version of the Content Manager is not open for external users unless invited by the LanGuide project coordinators.

To access the Content Manager, authors should sign in with the credentials provided, as shown in Figure 6.2. This functionality includes the pos-

Figure 6.2

Accessing the Content Manager with Provided Credentials

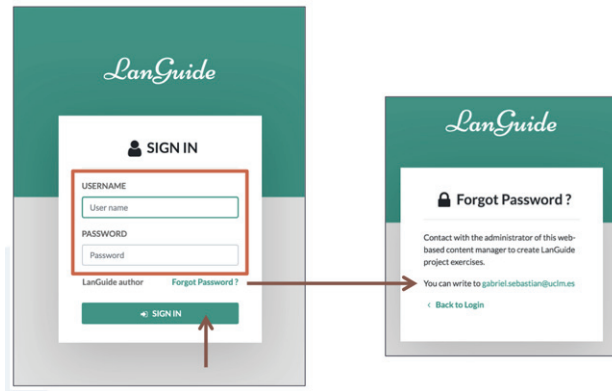
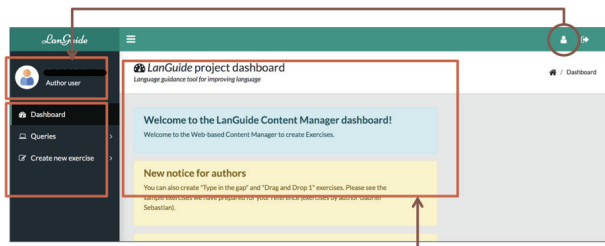


Figure 6.3

Content Manager Main Window



sibility of recovering forgotten passwords through the system administrator.

Main Functionality

The main functionality of the Content Manager can be accessed through the menu options on the left-hand side of the main window. Users can search for specific exercises or create new exercises, as shown in Figure 6.3. Users can search exercises by author or filter exercises according to different categorization fields. The system allows the creation of four types of exercises: Multiple choice, Select, Type in the gap and Drag and drop, as shown in Figure 6.4. It has been designed for users to be able to view all exercises, but they only can edit or delete the exercises created by themselves.

The system includes a dashboard, which has been designed as a notice board, to present updates or new features of the content manager that the authors need to be aware of when creating exercises or multimedia resources in the repository. The dashboard also provides access to the exercises and list of authors, as shown in Figure 6.5.

Figure 6.4
Menu with Basic
Functionality

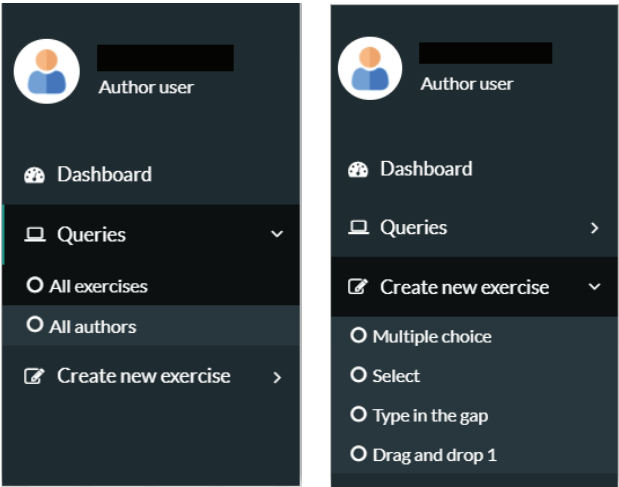
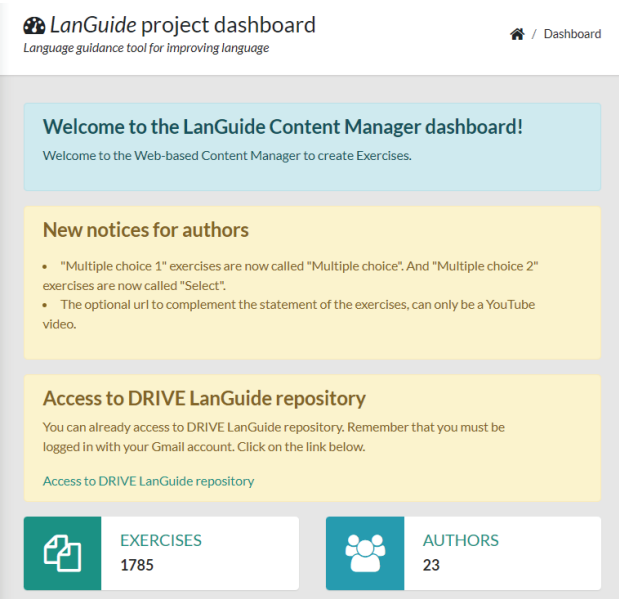


Figure 6.5
Content Manager
Dashboard



Authors. This function allows the visualization of the list of authors registered in the system, as shown in Figure 6.6. We can consult their name, email, and view the exercises created.

Exercises. This function allows the visualization of the list of exercises created in the Content Manager by the different authors. They can be sorted according to different categories (author, skill, level, etc.), as shown

The screenshot shows the LanGuide project interface. On the left, the 'Author List' section displays a list of authors and their creation dates. On the right, the 'Author: Cebzon, Neva' detail page shows her email and a list of exercises.

Author List

Authors information
List of people using the Web-based Content Manager to create exercises.

- Arraez, Ovidio (February 19th, 2021 -)
- Brkic B, Marija (February 19th, 2021 -)
- Cebzon, Neva (February 19th, 2021 -)
- Dimulescu, Cristina (February 23rd, 2021 -)
- Dobrin, Radu (March 12th, 2021 -)
- Fabijanic, Ivo (February 19th, 2021 -)
- Lozano, Maria (March 4th, 2021 -)
- Malenica, Franc (February 19th, 2021 -)
- Mustapic M, Enilija (February 19th, 2021 -)
- Nachitov, R, Lucia (February 19th, 2021 -)
- Nachitov, Andreea (February 19th, 2021 -)
- Owen, Alisd (June 10th, 2021 -)
- Pavetic, Nika (June 10th, 2021 -)
- Rautell, Philip (March 4th, 2021 -)
- Sebastian, Gabriel (February 19th, 2021 -)
- Slavuj, Vanja (February 19th, 2021 -)
- Sorgo, Lara (February 19th, 2021 -)
- User, Administrator (January 29th, 2021 -)
- Villegas, Emma B. (February 19th, 2021 -)
- Volk, Jens (May 7th, 2021 -)
- wpluser, wpluser (February 17th, 2021 -)
- Srtbac, Nemes, Jelena (June 10th, 2021 -)
- Sumarijak, Alena (May 7th, 2021 -)

Author: Cebzon, Neva
Email: neva.cebzon@rfs.upr.si
February 19th, 2021 -

Exercises

NC 001 - EN MOB greetings 001a
NC 002 - EN MOB greetings 001b
NC 003 - EN MOB greetings 002
NC 004 - EN MOB greetings 003a
NC 005 - EN MOB greetings 003b
NC 006 - EN MOB greetings 004a
NC 007 - EN MOB greetings 004b
NC 008 - EN MOB greetings 004c
NC 009 - EN MOB greetings 005
NC 010 - EN MOB socializing 011a
NC 011 - EN MOB socializing 011b
NC 012 - EN MOB socializing 012a
NC 013 - EN MOB socializing 012b
NC 014 - EN MOB socializing 013
NC 015 - EN MOB socializing 014a
NC 016 - EN MOB socializing 014b
NC 017 - EN MOB socializing 015
NC 020 - EN MOB numbers and dates 001

Figure 6.6
List of Authors
and Author Details

The screenshot shows the 'Exercise List' page. It includes a search bar, a table of exercises with columns for Exercise title, Author, Skill, Level, Learner, Language, and Activity type, and a pagination bar at the bottom.

Exercise List

You have to know that...
You can see all the exercises, but you can only edit the exercises created by you.

Show 10 entries Search:

Exercise title	Author	Skill	Level	Learner	Language	Activity type
Suffices (1)	Dimulescu, Cristina	Vocabulary	Basic	Student	English	type_in_the_gap
Suffices (2)	Dimulescu, Cristina	Vocabulary	Basic	Student	English	type_in_the_gap
Suffices (3)	Dimulescu, Cristina	Vocabulary	Basic	Student	English	type_in_the_gap
VS002 EAP_Slu_Bas_Writing	Slavuj, Vanja	Writing	Basic	Student	English	type_in_the_gap
VS013 EAP_Tex_Bas_Reading	Slavuj, Vanja	Reading	Basic	Teacher	English	type_in_the_gap
VS017 EAP_Tex_Bas_Writing	Slavuj, Vanja	Writing	Basic	Teacher	English	type_in_the_gap
AC004V1	Brkic B, Marija	Vocabulary	Intermediate	Administrator	English	type_in_the_gap
AC004WB	Brkic B, Marija	Writing	Intermediate	Administrator	English	type_in_the_gap
ANCD	Nachitov, Andreea	Vocabulary	Intermediate	Administrator	English	type_in_the_gap
Application for a job	Fabijanic, Ivo	Writing	Intermediate	Administrator	English	type_in_the_gap

Showing 251 to 260 of 1,785 entries

Previous 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 1028 1029 1030 1031 1032 1033 1034 1035 1036 1037 1038 1039 1040 1041 1042 1043 1044 1045 1046 1047 1048 1049 1050 1051 1052 1053 1054 1055 1056 1057 1058 1059 1060 1061 1062 1063 1064 1065 1066 1067 1068 1069 1070 1071 1072 1073 1074 1075 1076 1077 1078 1079 1080 1081 1082 1083 1084 1085 1086 1087 1088 1089 1090 1091 1092 1093 1094 1095 1096 1097 1098 1099 1100 1101 1102 1103 1104 1105 1106 1107 1108 1109 1110 1111 1112 1113 1114 1115 1116 1117 1118 1119 1120 1121 1122 1123 1124 1125 1126 1127 1128 1129 1130 1131 1132 1133 1134 1135 1136 1137 1138 1139 1140 1141 1142 1143 1144 1145 1146 1147 1148 1149 1150 1151 1152 1153 1154 1155 1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170 1171 1172 1173 1174 1175 1176 1177 1178 1179 1180 1181 1182 1183 1184 1185 1186 1187 1188 1189 1190 1191 1192 1193 1194 1195 1196 1197 1198 1199 1200 1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1217 1218 1219 1220 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1421 1422 1423 1424 1425 1426 1427 1428 1429 1430 1431 1432 1433 1434 1435 1436 1437 1438 1439 1440 1441 1442 1443 1444 1445 1446 1447 1448 1449 1450 1451 1452 1453 1454 1455 1456 1457 1458 1459 1460 1461 1462 1463 1464 1465 1466 1467 1468 1469 1470 1471 1472 1473 1474 1475 1476 1477 1478 1479 1480 1481 1482 1483 1484 1485 1486 1487 1488 1489 1490 1491 1492 1493 1494 1495 1496 1497 1498 1499 1500 1501 1502 1503 1504 1505 1506 1507 1508 1509 1510 1511 1512 1513 1514 1515 1516 1517 1518 1519 1520 1521 1522 1523 1524 1525 1526 1527 1528 1529 1530 1531 1532 1533 1534 1535 1536 1537 1538 1539 1540 1541 1542 1543 1544 1545 1546 1547 1548 1549 1550 1551 1552 1553 1554 1555 1556 1557 1558 1559 1560 1561 1562 1563 1564 1565 1566 1567 1568 1569 1570 1571 1572 1573 1574 1575 1576 1577 1578 1579 1580 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599 1600 1601 1602 1603 1604 1605 1606 1607 1608 1609 1610 1611 1612 1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624 1625 1626 1627 1628 1629 1630 1631 1632 1633 1634 1635 1636 1637 1638 1639 1640 1641 1642 1643 1644 1645 1646 1647 1648 1649 1650 1651 1652 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1767 1768 1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 1786 1787 1788 1789 1790 1791 1792 1793 1794 1795 1796 1797 1798 1799 1800 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815 1816 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867 1868 1869 1870 1871 1872 1873 1874 1875 1876 1877 1878 1879 1880 1881 1882 1883 1884 1885 1886 1887 1888 1889 1890 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902 1903 1904 1905 1906 1907 1908 1909 1910 1911 1912 1913 1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934 1935 1936 1937 1938 1939 1940 1941 1942 1943 1944 1945 1946 1947 1948 1949 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 226

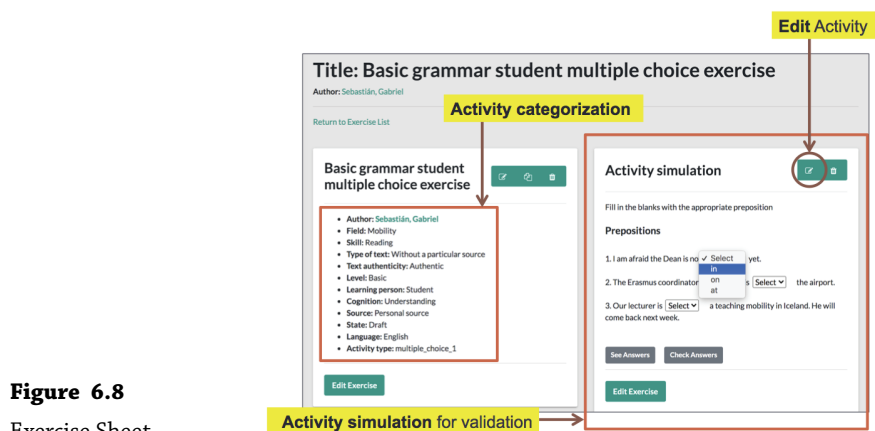


Figure 6.8
Exercise Sheet

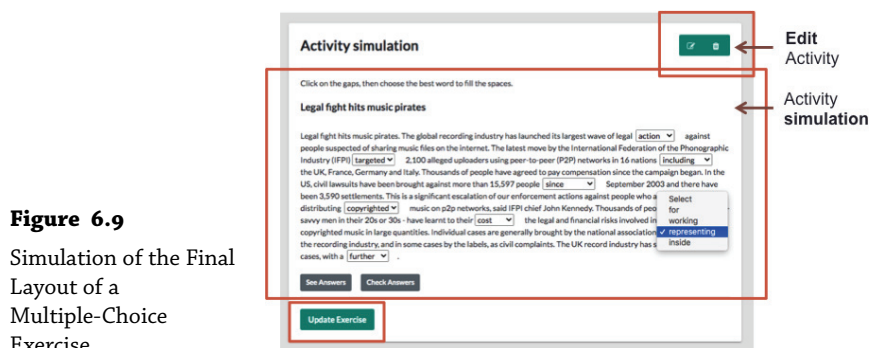


Figure 6.9
Simulation of the Final
Layout of a
Multiple-Choice
Exercise

been introduced during the definition of the exercise. Figure 6.9 shows the simulation interface of a Multiple-choice exercise, highlighting the main options of this interface. This way, we can see the final layout of the exercise and check its correctness before publishing it.

Creating and Modelling Exercises with The Content Manager

When creating an exercise, the Content Manager shows at the beginning the warnings and notices that the authors should take into account during the exercise configuration. This information is different depending on the type of exercise. Figure 6.10 shows an example of the information provided before the creation of a Multiple-Choice exercise.

Firstly, authors must define the Exercise Categorization (shown in Figure 6.11) by typing in and selecting the different options, which correspond to the categorization of exercises defined in the LanGuide Methodology. This categorization is the same for all types of exercises.

Figure 6.10
Information Provided before the Creation
of a Multiple-Choice Exercise (above)

Figure 6.11
Exercise Categorization Form as Defined
in the LanGuide Methodology (right)

Figure 6.12 Detail of Some Options from the Exercise Categorization

Some details of the categorization options are shown in Figure 6.12, where we can see the number of available Languages in which authors can create exercises, the Fields, Skills and Learning person, to show but a few.

In addition to the categorization fields, the exercises are modelled with a series of metadata that define their presentation and final behaviour. Authors have the possibility to include a link to a YouTube video, insert an image, text or audio file from the repository of multimedia resources.

As an example, next we show the metadata definition of a ‘Type in the gap’ exercise (see Figure 6.13).

Figure 6.13

Exercise Configuration
for Type in the Gap
Exercises

The 'Exercise configuration' form includes fields for Title, Instructions, URL, Image, Audio, and Text, each with a placeholder text indicating where to enter content. Below these is a 'Phrase Items' section with three sub-fields: 'Text' (before the gap), 'Gap' (the gap itself, with a note about multiple solutions), and 'Text' (after the gap). An 'Add Item' button is at the bottom left of this section. At the bottom right of the form are three buttons: '1. Validate', '2. Submit', and 'Cancel'.

The 'Exercise configuration' form for 'Drag and Drop' includes a 'Phrases On Same Paragraph' checkbox and a 'Matchings' section. The 'Matchings' section contains four items, each with a 'Statement' and an 'Answer' field. The first item has 'Really, (1)' as the statement and 'my' as the answer. The second has '(2)' as the statement and 'English' as the answer. The third has '(3)' as the statement and 'is' as the answer. The fourth has '(4)' as the statement and 'rich' as the answer. An 'Add Item' button is at the bottom left. At the bottom right are three buttons: '1. Validate', '2. Submit', and 'Cancel'.

Figure 6.14

Exercise Configuration for a Drag and Drop
Exercise

The 'Activity simulation' interface shows the exercise 'Composing a phrase...' with the instruction 'Match correctly the phrase:'. Below this is a row of four items: 'Really, (1)' with a dropdown menu showing 'my', '(2)' with a dropdown menu showing 'English', '(3)' with a dropdown menu showing 'is', and '(4)' with a dropdown menu showing 'rich'. Each item has a green checkmark next to it. Below the row is a red notice: 'Notice: The simulation of "Drag and drop 1" exercises, does not offer a "drag and drop" interaction experience. The real experience will be available when using the APP. Here, the simulation only serves to "validate" the exercises modeled by the authors.' At the bottom are three buttons: 'See Answers', 'Check Answers', and 'Reset'. At the very bottom is a green 'Edit Exercise' button.

Figure 6.15

Exercise Simulation Corresponding to the
Drag and Drop Exercise of Figure 6.14

Another example is shown in Figure 6.14, where we can see the exercise configuration for a Drag and Drop exercise. The look and feel of that exercise can be seen in the activity simulation, which is shown in Figure 6.15. It is important to note that the simulation of the Drag and Drop exercises cannot offer the real interaction experience for the final users. This will be possible when performing the exercise in the mobile app. In this case, the simulation is useful to check the correctness of the exercise created.

Functionality of The Administrator Role in The Content Manager

The Content Manager includes the role of Administrator with specific functionality for the management of the target users of the system, who are the

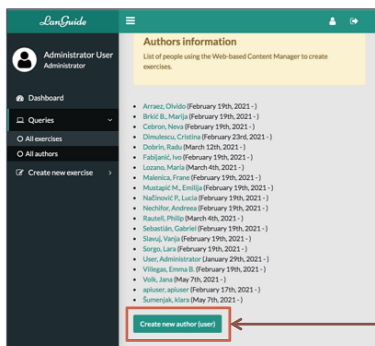


Figure 6.16
Creation of New Authors by the
Administrator Role

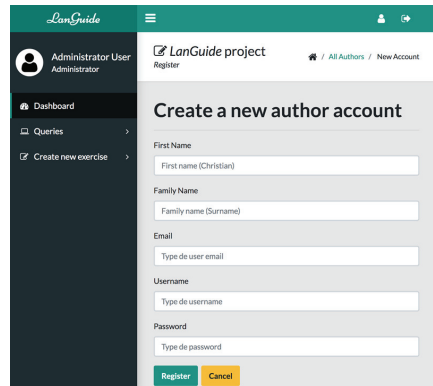


Figure 6.17
Registering a New Author by the
Administrator Role

authors of the exercises. The main functionality of the Administrator is the following:

- Register new users with the role of author (Figure 6.16)
- Edit the data of a user with the role of author (Figure 6.17)
- Delete a previously created user with the role of author (Figure 6.18)

Common Repository for Multimedia Resources

The Content Manager integrates a shared repository to store multimedia resources, such as pictures, YouTube videos, audio files or long texts. Authors can access to the repository directly through the Content Manager, as shown in Figure 6.19. Figure 6.20 shows some of the resources created by the linguists of the project to be used in the exercises.

The repository of multimedia resources has been configured in such a way that anyone can use the resources of any author but can only delete or modify the resources created by themselves. Authors can associate a resource stored in the repository to a specific exercise in the corresponding exercise configuration form, as shown in Figure 6.21.

Evaluation of The LanGuide Content Manager

The Content Manager has been assessed twice. The first assessment took place after the first fully operational version was released and deployed in the definite server² and the linguists of the project had used it to create the first exercises with the tool.

² <https://cm.languide.si>.

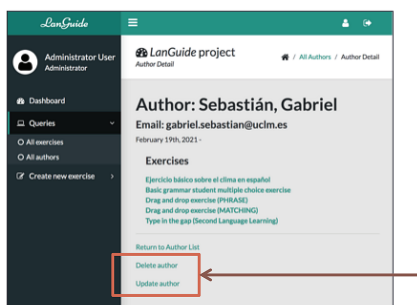


Figure 6.18
Deleting and Updating Authors by the Administrator Role

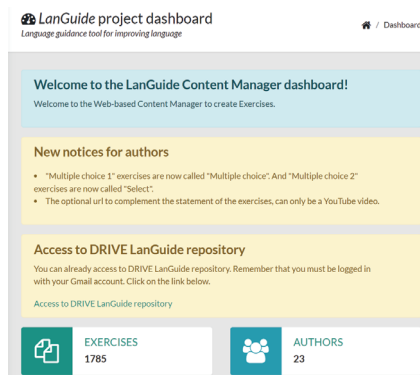


Figure 6.19
Direct Access to the LanGuide Repository of Multimedia Resources

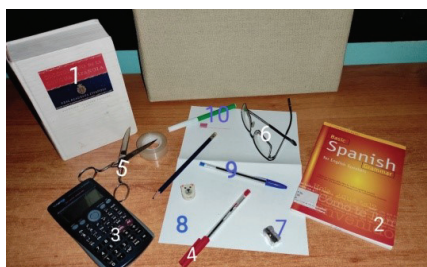
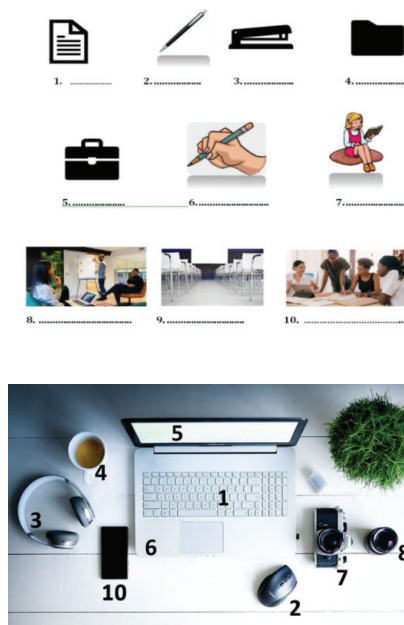


Figure 6.20 Example of Resources Stored in the Multimedia Repository



The evaluation was focused on the quality in use, usability and learnability of the Content Manager and was performed with 12 participants with the role of authors who used the system to create and manage exercises for some time before the assessment. All participants have user-level office skills and experience in using some everyday web applications.

Nine out of the 12 participants were women and 3 of them were men. All

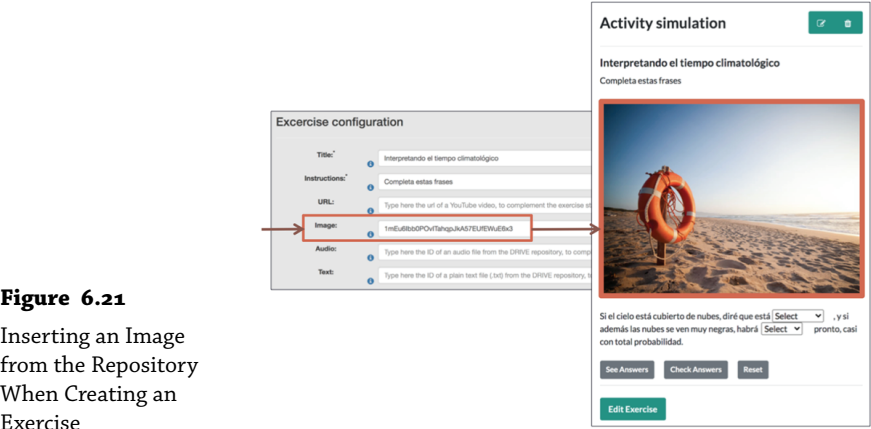


Figure 6.21
Inserting an Image
from the Repository
When Creating an
Exercise

Table 6.1 SUS Questionnaire

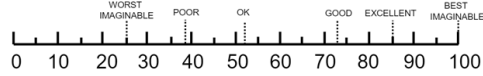
s1	I think that I would like to use the Content Manager frequently.
s2	I found the Content Manager unnecessarily complex.
s3	I thought the Content Manager was easy to use.
s4	I think that I would need the support of a technical person to be able to use the Content Manager.
s5	I found the various functions in the Content Manager were well integrated.
s6	I thought there was too much inconsistency in the Content Manager.
s7	I would imagine that most people would learn to use the Content Manager very quickly.
s8	I found the Content Manager very cumbersome to use.
s9	I felt very confident using the Content Manager.
s10	I needed to learn a lot of things before I could get going with the Content Manager.

of them had a basic understanding of the tool before starting the evaluation. All participants were provided with their credentials and access instructions, as well as a simple user manual on how to use the functionality of the application.

We have based the evaluation on the widely used method called System Usability Scale (SUS) (Brooke, 1996). The SUS scale consists of a set of 10 questions, as shown in Table 6.1. In the questionnaire, odd-numbered items are positive, while even-numbered items are negative, in order to reduce acquiescence response bias. Participants were asked to respond in a Likert scale of five points – from 1 to 5 – representing respectively: ‘strongly disagree,’ ‘disagree,’ ‘neutral,’ ‘agree’ and ‘strongly agree.’ After applying the corresponding formula to the answers, as defined by Brooke (1996), the

Figure 6.22

Valuation Rule for the SUS Scale

**Table 6.2** Results of the Content Manager Evaluation

Participant	s1	s2	s3	s4	s5	s6	s7	s8	s9	s10	(1)	(2)	(3)
1	5	1	5	2	4	2	4	1	4	2	85,0	87,5	75,0
2	5	3	4	1	5	2	4	1	4	2	82,5	81,3	87,5
3	2	5	2	4	3	4	2	4	4	3	32,5	31,3	37,5
4	3	4	3	5	2	3	4	4	2	3	37,5	40,6	25,0
5	5	1	5	2	5	1	5	1	5	1	97,5	100,0	87,5
6	4	4	3	4	4	3	4	2	4	3	57,5	62,5	37,5
7	3	1	5	1	2	1	5	4	5	1	80,0	75,0	100,0
8	4	2	4	2	4	2	4	2	4	1	77,5	75,0	87,5
9	4	1	4	2	5	2	4	1	5	1	87,5	87,5	87,5
10	5	1	5	1	5	1	5	1	5	1	100,0	100,0	100,0
11	5	1	5	2	5	1	5	1	5	2	95,0	100,0	75,0
12	3	2	4	1	2	3	4	2	4	1	70,0	62,5	100,0
Average											75,2	75,3	75,0

Notes Column headings are as follows: (1) SUS, (2) usability, (3) learnability.

result is a number between 0 and 100, whose meaning is shown in Figure 6.22. The results of the assessment are shown in Table 6.2, which lists the scores of the ten statements of the questionnaire. In the last columns, the overall SUS score (SUS), the Usability factor score (Us.), and the Learnability factor score (Le.) are listed separately. The SUS score is 75.2 which is considered between ‘good’ and ‘excellent’ according to the adjective ratings (Bangor et al., 2009) defined for the SUS scale (see Figure 6.22). The SUS results for the 12 participants are shown in Figure 6.23.

We have also investigated the assessment of usability and ease of learning based on two sets of factors. Statements 4 and 10 of the SUS questionnaire (Table 6.1), contribute to the evaluation of the ease of learning, while the remaining statements of the questionnaire contribute to the evaluation of the usability (Lewis, 2009). Adding the scores of statements 4 and 10 and multiplying by 12.5 we can evaluate the system learnability, which is shown in the last column of Table 6.2. The average score regarding learnability is 75.0 out of 100, which means that this tool has a high degree of learnability, requiring just a little bit of time and help. The usability score is calculated by adding the score of the other statements and then multi-

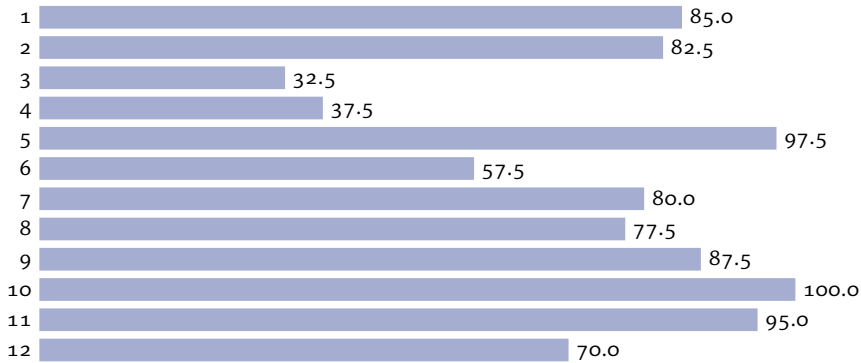


Figure 6.23 SUS Results

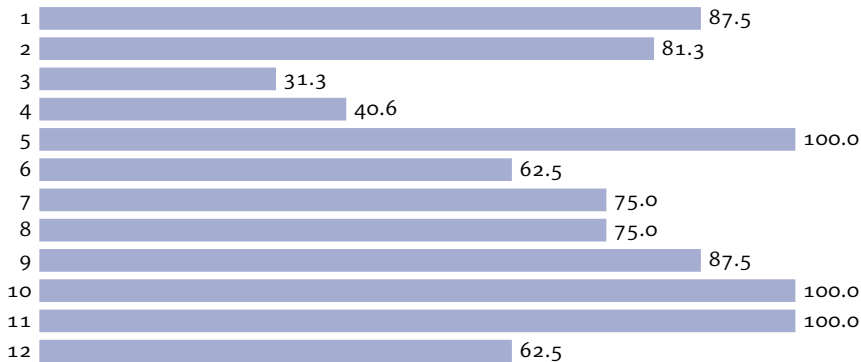


Figure 6.24 Usability Results

plying all by 3.125. The average score regarding usability is 75.3 out of 100, which indicates a very good attitude of the users towards the LanGuide Content Manager.

The results obtained for usability and learnability are shown in Figure 6.24 and Figure 6.25, respectively. As we can see in the different charts, most users have high scores, except two users (3 and 4) who show the lowest scores, even below 50. But in general, from the above analysis, we can conclude that most of the users are quite satisfied with the Content Manager as a tool to create and manage exercises within the LanGuide project and show a very good attitude towards the usability and learnability of the LanGuide Content Manager.

Conclusions and Final Remarks

This chapter presents the LanGuide Content Manager, one of the IT tools developed within the LanGuide project to provide a system for linguists to

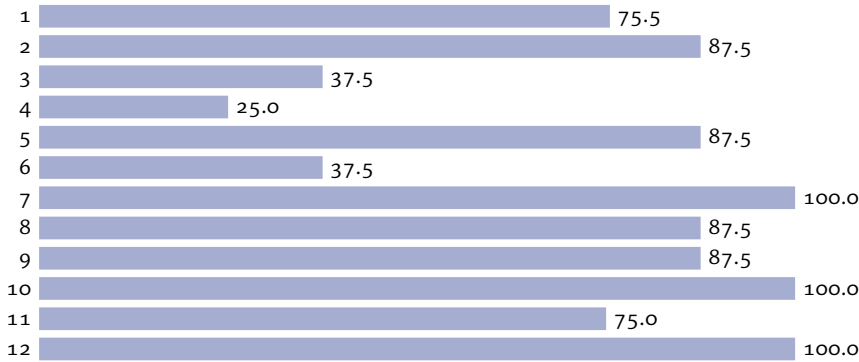


Figure 6.25 Learnability Results

create learning exercises in different languages, levels and fields according to the LSP and methodology defined in the project.

The Content Manager has been developed as a Web-based application applying the latest development technologies to allow users to access the tool in an easy way through any browser. During the development of the Content Manager, the current usability criteria have been followed to provide the users with a good interaction experience and reduce the learning curve that any IT tool has. In addition, the Content Manager has been enriched with a repository of multimedia resources to allow users to create and share multimedia resources to be included in the exercises.

The Content Manager includes all the features defined during the project and includes the possibility of previsualizing the exercises created for the authors to check that they had been correctly created.

The linguists of the project have used the LanGuide Content Manager to create the more than 1500 exercises currently available in the system. After a long period of using the system, we have performed a formal evaluation applying one of the most widely used evaluation methods, the System Usability Scale (SUS). The evaluation results have been very positive, providing a result between good and excellent. So, we can conclude that the LanGuide Content Manager fulfills the needs defined in the project to support linguists during the creation of LSP learning exercises.

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