MP3 Player Powered by Voice Commands

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INTRODUCTION

The Assistive Technology is an interdisciplinary area of knowledge, which includes products, special software and hardware that aim to promote or expand functional abilities of people with disabilities, inabilities or reduced mobility, improving their accessibility, social inclusion, digital inclusion and quality life. The digital inclusion of people with disabilities is the right to access autonomously to Information and Communication Technologies for intellectual development (education, knowledge generation and leisure activities) and operational, promoting the inclusion of all in the information society.

METHODS

- The software presented in this paper, called "**MP3 Player**", was implemented using the integrated environment of visual development with support for object-oriented programming and used to create applications with graphical interfaces *Borland® Delphi 7 Enterprise Edition* for *Microsoft® Windows 7* operating system (**Figure 1**).
- That application is designed to respond to 7 voice commands, identified in **Figure 2: a**) "Prior", **b**) "Next", **c**) "Select", **d**) "Clear", **e**) "Play", **f**) "Stop", and **g**) "Close". By means of the commands "Prior", "Next", "Select", and "Clear" the user select which songs will be played. The "Play" command connect the player and the selected songs begin to be played. The "Stop" command stops the music running and, finally, the "Close" command shuts down the application.
- The ability of speech recognition implemented in software was designed using the component "**DEscuta**" of the technology "DVOZ Biometria" (**Figure 3**).
- Experiments to validate the features and usability of the "**MP3 Player**" were held during the month of March 2014 with a group of 12 people, 7 (58.33%) males with a mean age around of 36 years old and 5 (41.67%) females with a mean age around of 31.6 years old.
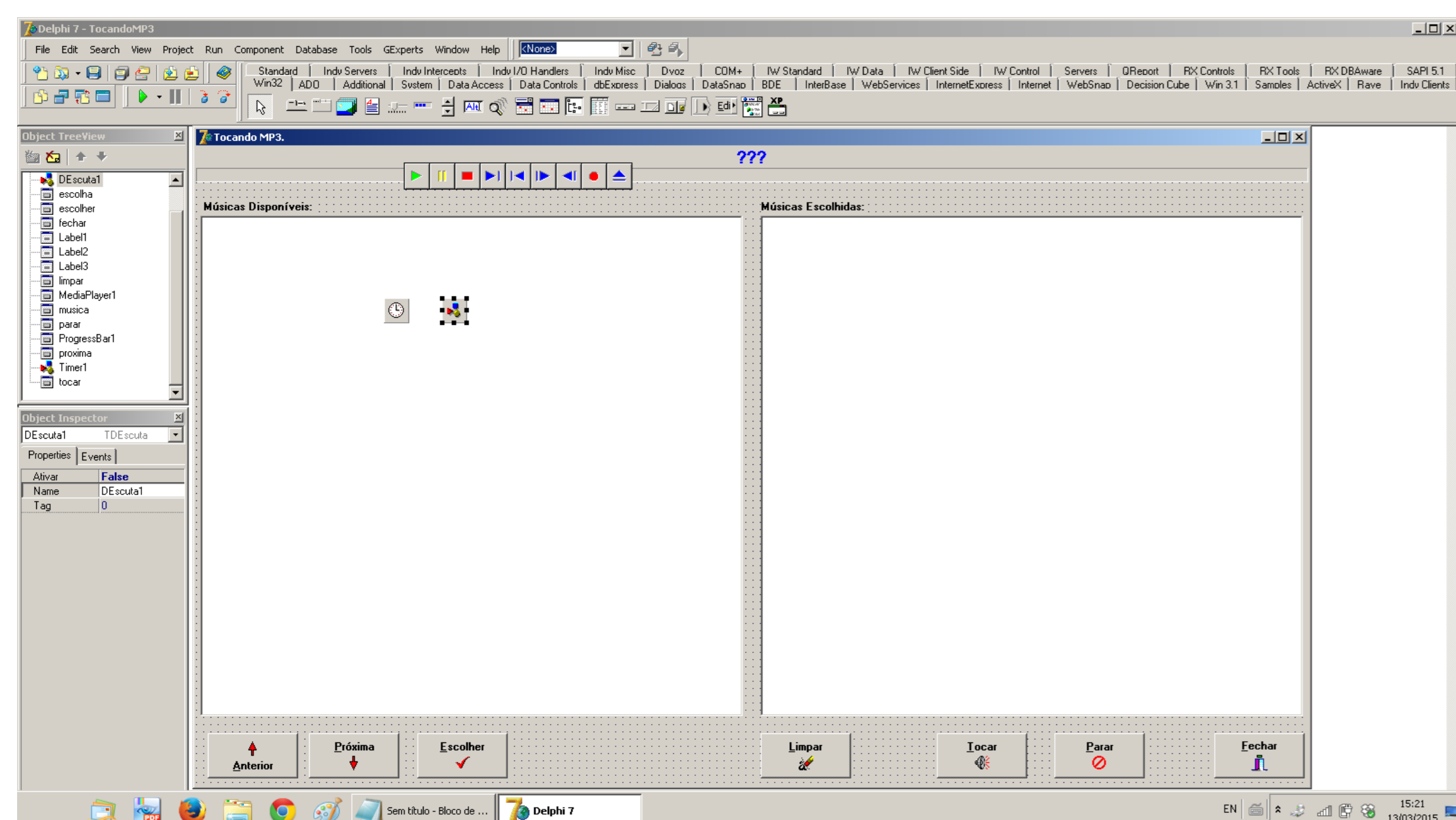

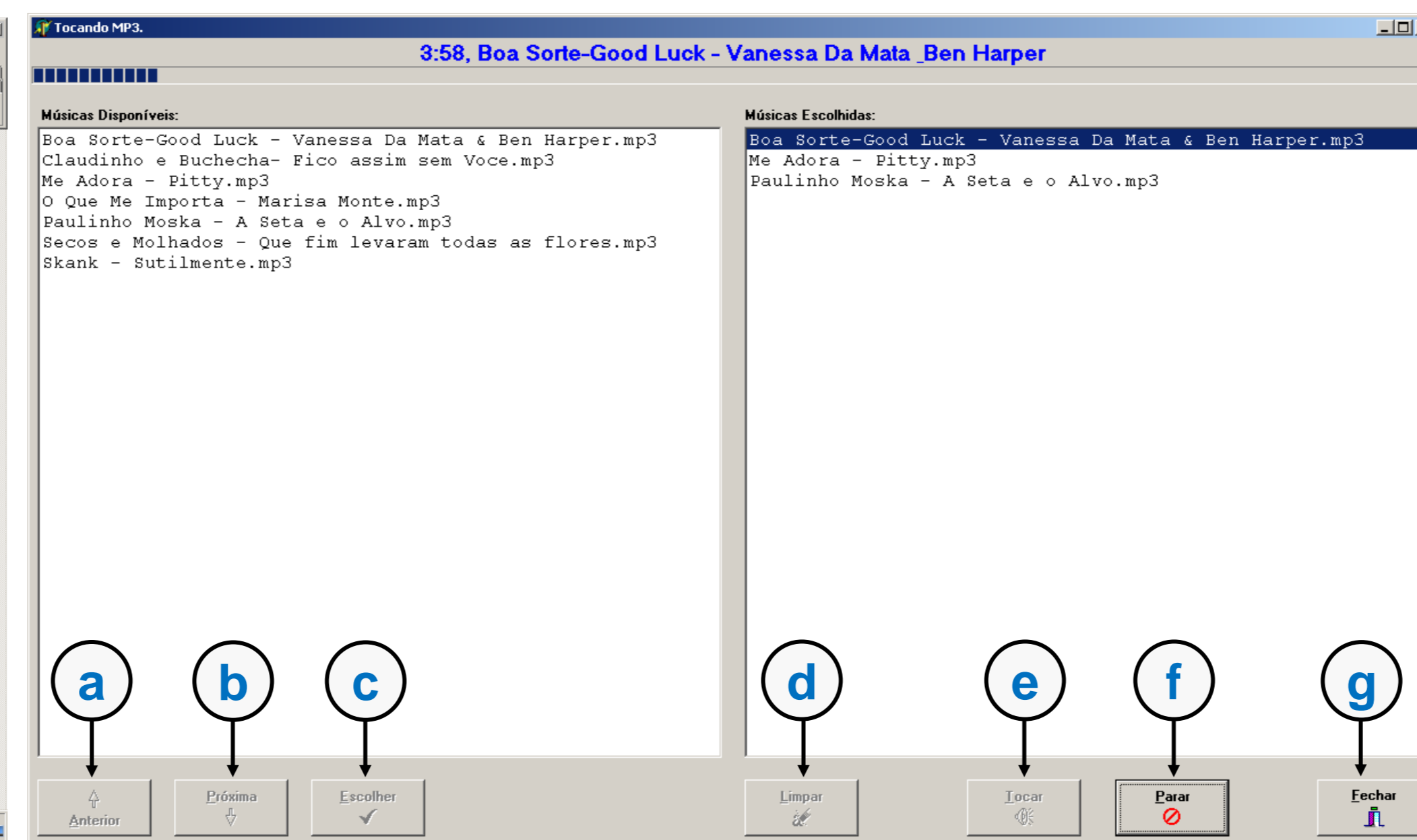**Figure 1.** Delphi programming environment – "MP3 Player" at design time.
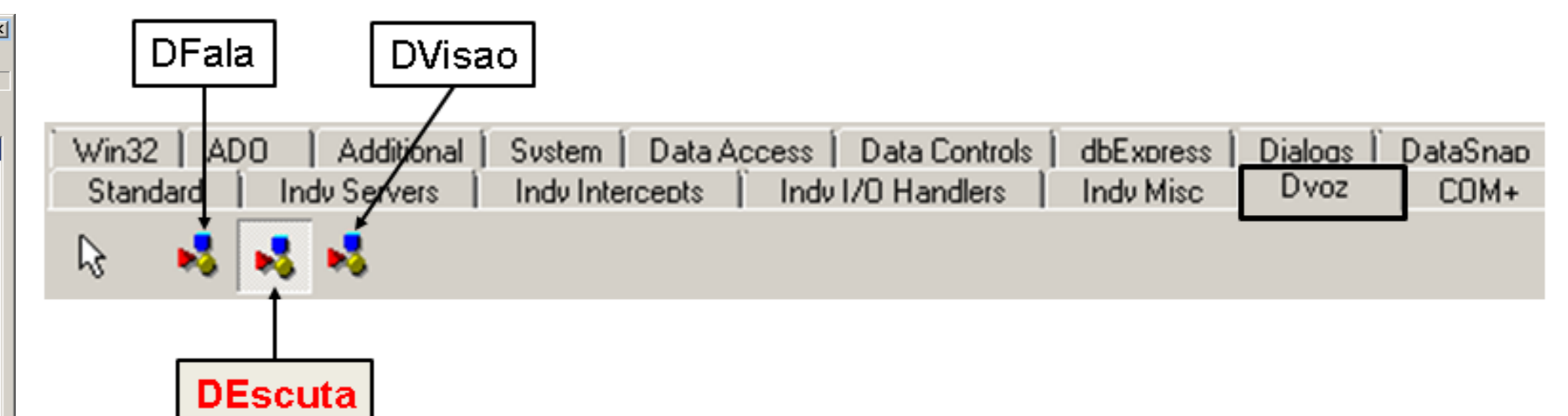

Figure 2. "MP3 Player" at runtime.

Figure 3. Components of the technology "DVOZ Biometria".

RESULTS

- For each of the experiments, the person involved received a about 2 min training on the features of "MP3 Player".
- Then was asked to be executed a set of 18 voice commands, in the order: "Next", "Next", "Select", "Clear", "Next", "Select", "Next", "Select", "Clear", "Prior", "Select", "Prior", "Prior", "Select", "Play", "Stop", "Stop", and "Close". Step by step was recorded the number of attempts required, so that its voice command present a positive response. Overall, 226 voice commands were submitted, 10 unsuccessful attempts, representing an overall performance of 95.58% accuracy (**Table 1**).

CONCLUSIONS

- This paper presents a "**MP3 Player**", application that was modeled and developed to run on Windows 7 operating system in order to "play" music in MP3 format responding to voice commands. This feature allows the end software can be used to assist people with disability to use the input devices such as keyboard or mouse.

- The application "**MP3 Player**" powered by voice commands presented may represent a technological product to assist people with disabilities to use the resources that the computer offers to perform daily activities independently.

Table 1. Results of the experiments "attempts" *vs.* "% accuracy".

order	command	attempts	% accuracy
1	Next	12	100%
2	Next	12	100%
3	Select	12	100%
4	Clear	13	92,32%
5	Next	14	85,71
6	Select	12	100%
7	Next	12	100%
8	Select	12	100%
9	Clear	12	100%
10	Prior	12	100%
11	Select	12	100%
12	Prior	12	100%
13	Prior	12	100%
14	Select	12	100%
15	Play	12	100%
16	Stop	14	85,71%
17	Stop	17	70,59%
18	Close	12	100%
TOTAL		226	95,58%