Designing a relational database to alleviate the impacts of foreign words on the Turkish Language

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Abstract

The impacts of recent advances in technology on Turkish language have been seen obviously in the fields of computer, electric and electronics. Additionally, latest developments in information and communication technologies with the appearance of the Internet have affected Turkish in the areas of commerce, education and entertainment. As the rapid advancements in ICTs are usually discovered by developed countries, those reveal the need for new words in Turkish. The spread of the foreign originated terms impairs the tradition of the Turkish language and its image. For instance, the simplest negative impact of foreign words can be seen on the Turkish vowel harmony. Since the use of the foreign originated words in Turkish language impairs both the Turkish spelling and utterance, the use of the equivalence of the foreign terms has been perceived as an important solution. Despite of this solution, it is not possible for Turkish speakers and writers to analyse the origins of the words that they select. In particular, the publications such as journals, papers, reports are evident in this case. Therefore, to alleviate the negative impacts of foreign words, a relational database design is essential. Upon the execution of this design, the origin of the words and their equivalences in papers, journals and reports can be identified with ease by Turkish's speakers and its writers and those words can be swapped with their equivalences in Turkish language to alleviate the impact of foreign languages on Turkish prior to the press of journals and reports.

Keywords: Impacts of foreign words, Turkish Language, relational database, terms

1. Introduction

People communicate with each other for many purposes such as expression of needs and want, information transfer, social closeness and social etiquette (Locke, 1988). There are various types of human communication namely verbal (e.g. face-to-face & telephone), non-verbal (e.g. body language & gestures), written (e.g. Internet & textbooks) and visual (e.g. maps & graphs). However, language is an extremely important way of communication with people as it fundamental part of all types of human communication. Today, it is assumed that the number of languages in the world varies between 3,000 and 6,000 (Özsoy, Balcı, & Turan, 2012) whereas large differences between languages exist especially in terms of number of their speakers. For instance, the number of speakers of the Chinese language is more than a billion whereas the last known speaker of the Clallam language (i.e. Hazel Sampson) died in 2014 and Clallam now no longer has any speakers on the world. Nowadays, the speakers of all the languages on the world interact with each other in a way. Languages, especially those with the long history, such as Arabic, Chinese and Turkish are particularly affected by other ones (Sarı, 2008). It is also true that Turkish like other languages has tendency to change and improve (Özkan & Musa, 2004). The impact of foreign languages on the Turkish language varies over time because many foreign originated words

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used in the Turkish language were derived from different times (Tekten, 2009). The emerging developments in the 21st century such as those in politics, culture, science, and so on affect all individuals as it affects all of the assets in the language. Particularly, the Turkish language based on a very long history has been affected by those developments inevitably. Especially the impacts of technological advancements have been obviously seen in the fields of computer, electric and electronics on the Turkish language. Additionally, recent advances in information and communication technologies (ICTs) with the appearance of the Internet have affected Turkish in the areas of commerce, education, law and entertainment.

The influence of the Internet on the Turkish Language was investigated by Yaman and Erdoğan (2007) based on four factors namely *sound characteristic*, *words*, *syntax* and *orthography*. They observed that new expressions, patterns, symbols and using practices are usually entering in the Turkish language via the Internet and spoil the structure of the Turkish language and cause degeneration. For instance, foreign originated words do not take suffixes based on the palatal harmony of the Turkish language such as "kontrolü" derived from "control" and "folklore" derived from "folk". The writing and speaking of the foreign originated words are also different such as the words "Show-Şov" & "Şarj-Şarz" (Tekten, 2009).

The spread of the foreign originated terms impair the tradition of the Turkish language and its image (Akalın, 2003). For instance, the basic negative impact of foreign words can be seen on the Turkish vowel harmony. In particular, the publications such as journals, papers, reports are evident in this case. As the use of the foreign originated words in Turkish language impairs both the Turkish spelling and utterance, the use of the equivalence of the foreign terms has been perceived as an important solution. Turkish Language Association (TDK) made available the Turkish equivalence of 1948 foreign originated words on 12 July 2010 using a Foreign Word Equivalence Manual, which is available on-line. Despite of this solution, it is not possible for Turkish speakers and writers to analyse the origins of the words that they speak and write.

Therefore, to alleviate the negative impacts of foreign words, a relational database design is required. Upon the execution of this design, the origin of the words and their equivalences used in papers, journals and reports can be identified with ease by Turkish's speakers and its writers. In this way, prior to the press of journals and reports, the foreign originated words can be swapped with their equivalences in Turkish language. Therefore, the impact of foreign languages on Turkish can be alleviated.

2. The impacts of foreign words on the Turkish Language

As the spread of the foreign originated words impair the tradition of the Turkish language and its image, Bedri (2001) points out that the major issue of Turkish in the recent years is highly associated with the number of the words taken from foreign languages. The negative impacts of the foreign words can be examined by investigating the various aspects of the Turkish language. The great linguist Edward Sapir characterized the Turkish language as exhibiting a sober logic (Sapir, 1921). Slobin and Zimmer (1986) emhpasize the sober logic of the Turkish language as cyrstalline strings of agglutinated morphemes, regular and exceptionless in their arrangements. Today, due to the impacts of the foreign words, the Turkish language gives an illusion to foreigners that Turkish has no grammar as it is abound in exceptions and irregular words (Tekten, 2009).

As Turkish is an agglutinative language, the suffixes added to the foreign originated words such as "hacker", "online" and "mortgage" cause Turkish to appear strange and ridiculous.

Yiğit and Karaduman (2011) implemented a study to find out the views of teacher-canditates about their preference between the Turkish and English languages while using terms in the discipline of computer science (e.g. server-sunucu, driver-sürücü and computer-bilgisayar) and the findings indicate that teacher-canditates are not sensitive and not conscious about the use of the Turkish language as the arithmetic mean of the items in their survey findings are so close to each other. However, they also emphasize that female teacher-candidates are much more sensitive about the use of computational terms using the Turkish synonyms. Today, the impacts of the Internet environment and media are appearing on the use of language in societies. Temur and Vuruş (2009) implemented a study on the influence of the Internet on the Turkish language and revealed that the characteristics of the Turkish sounds are not taken into consideration namely: the use of The Turkish letters (e.g. cok uzgunum, chark etti & ewe gitmem gerek); orthographic rules (e.g. slm-selam and bn kçr-ben kaçar); and word and sentence structures (e.g. chok cool çıkmıssın).

3. A model for designing a relational database

Tekten (2009) classifies the impacts of the foreign originated words on the instruction of Turkish as a foreign language into many categories namely: suffixing Turkish words with the foreign originated words (e.g. dost<u>ane</u> and kafa<u>dar</u>); destroying the Turkish harmony (e.g. kontrolü and folklore); differences between writing and speaking as Turkish is pronounced as written (e.g. show-şov and cafe-kafe); various forms of the foreign originated words (e.g. radyo-radio & doctor-doktor); masculine and feminine grammar as Turkish is neuter (e.g. aktör-aktris and müdür-müdire); prefix use (e.g. bihaber and asosyal); complexity in syllabification (e.g. telgraf, electron and ekstra). Tekten also emphasizes the utilization of the Turkish equivalence of the foreign originated words may alleviate the impacts of foreign words (e.g. hürriyet-özgürlük, dost-arkadaş, kalp-yürek and realizm-gerçekçilik). Aydoğan (2001) also analyses the foreign originated words under two categories: the compatible and incompatible with the image of the Turkish languages (e.g. palace-palas, show-şov, full-ful and casino-gazino). Additionally, Başçetinlik (2009) analyses the use of the foreign originated words in the Turkish language in terms of the phonetics of the letters (e.g. ch-ş, q-k, x-k, x-s, w-v and sh-ş). She also found that there is a tendency regarding the transcription of the Turkish letters to English so as to ensure that foreigners pronounce the Turkish words in correct (e.g. arkadaş-arkadash).
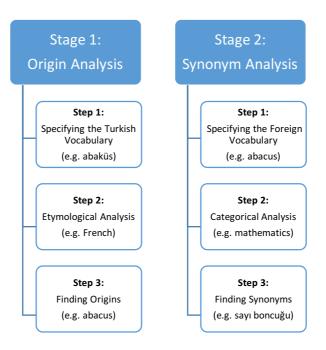
Distinctly, Özkan & Musa (2004) analyses the impacts of the foreign languages in terms of the syntax of the Turkish language and they also emphasize that the impact of the foreign languages influence the lexical, morphological and syntactic characteristics of Turkish. Moreover, Arslan (2012) seeks the impacts of the Turkish language on other languages in the process of teaching and learning Turkish as a foreign language. For instance, the use of 349 Turkish words were specified in the Chinese language (İnayet, 2008). In addition to the image and syntax of Turkish, the roots of the words in Turkish should be also analysed so as to determine the foreign originated words on the Turkish language. Memmedova (2009) examines the influences of non relative languages to each other and notes that some of the words borrowed from foreign languages holds their traditional meeaning (e.g. banka, banyo, bira, çimento and lokanta). The use of the Turkish equivalence of the foreign originated is considered as a major

solution. Ören (2005) emphasizes that there are many ways to aliavete the impacts of the foreign originated words especially in the discipline of informatics namely: having linguistic consciousness, the use of the Turkish equaivalance, enrichment of the terms in informatics and digitilizing all the studies in the Turkish Language Association. Moreover, Yunusoğlu (2006) investigates the terminology related to the computer technology in terms of their metaphoric structures and expressions.

Yunusoğlu notes that there is a significant relationship between the meaning of terms in computer and in the daily life (e.g. window, mouse and file). However, the metaphors used in the source language (e.g. English & French) related to the computational technology may not be the same in the target language (i.e. Turkish). The mentioned studies described above point out that a number of factors should be considered so as to design a relational database to alleviate the impacts of the foreign originated words on the Turkish language. It is possible to propose a model for designing a relational database with the purpose of alleviating the impacts of foreign originated words on the Turkish language upon the analysis of the findings obtained from the academic studies as illustrated in Figure 1.

Figure 1. A model for designing a relational database

As shown in the Figure 1, the model consists of two stages namely: (i) origin analysis and (ii) synonym analysis. The model points out that the origins of the foreign originated words and their equivalences should be analysed to deal with the impacts of foreign languages on the Turkish language. To carry out an origin analysis, three steps should be applied. First, the vocabulary which currently appears in the Turkish language, regardless of whether they are originally Turkish or not, should be stored into the database to specify the origins of the foreign originated words. Second, the etymology analysis should be carried out to find out regarding the language which a foreign originated word is derived from. Third, the original spelling of the foreign originated words is investigated.

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After analysing the origin of the words used in Turkish, the equivalences of the foreign originated words should be implemented in three steps. First, the foreign vocabulary should be investigated in order to ensure that the Turkish equivalence of the foreign originated words is obtained. Second, a categorical analysis should be applied since majority of the foreign originated words are derived from a foreign language through a discipline (e.g. geography & medicine). Third, the equivalence of the foreign originated words is also investigated to make sure that the synonym analysis is implemented accurately.

4. Designing a relational database

Databases play a crucial role within science, business, education, law, culture and all areas of human studies since they are fundamental to the scientific advances (Sumathi & Esakkirajan, 2007). A database is described as a well-organized collection of data stored in a computer system in a meaningful way that it can be easily accessed or changed. It is also important to create, manage and maintain a database in order to ensure that data is available to people in the accurate form and in a timely manner to let them interpret the data in a meaningful way (Homan & Kovacs, 2009). A number of database models have been developed in order to verify the data availability, integrity and security with the aid of database management systems namely hierarchical, network, relational and associative databases. Relational databases are the most popular and widely used database structure in the world and are also supported by a variety of vendors such as Oracle and Microsoft. It is important to design a relational database to alleviate the impacts of the foreign words on the Turkish language in terms of lexical, morphological and syntactic aspects of the Turkish language. The model described in Figure 1 is taken into account in order to design the relational database as illustrated in Figure 2 and 3.
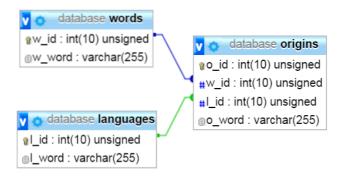
4.1. Specifying the origins of the words in Turkish

Etymology is described as the study of the origin and history of words. A number of methods are used to study the origins of words such as philological research, use of dilectogical data and comparative methods and the study of semantic change. Turkish Language Association (TDK) prints a number of dictionaries (e.g. The Great Turkish Dictionary, GTD) with the origins of the foreign originated words in Turkish. The GTD indicates that the foreign originated words in Turkish are derived from various languages (e.g. Arabic, English, French & Greek). Moreover, the GTD also illustrates that a number of words share the same spelling and pronunciation with different meanings.

For example, the word "aba" is used in Turkish as a mother. However, it is also described as a foreign originated word derived from Arabic to describe a thick and coarse cloth made of wool. It is therefore important to design a relational database which deals a number of words that are homonyms. As illustrated in Figure 2, tables called "words", "languages" and "origins" were created to analyse and specify the origins of words in the Turkish language. The table "words" is used to store the vocabulary of the Turkish languages without any inflectional morphomes. Moreover, the table "languages" shows all the languages, in which a foreign originated word in Turkish may belong to. As illustrated in Figure 2, one-to-many relationship occurs between the tables "words" & "origins". and between the tables "languages" & "origins" since a word and a language may occur many times in the table "origins". For instance, the word "aba" exists in the table "origins" twice as illustrated in Table 1.

Figure 2. Analyzing the roots of the Turkish words

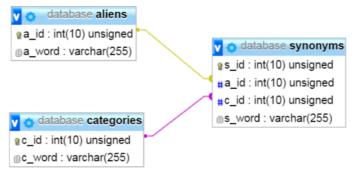### 4.2. Analysing the synonyms of the foreign originated words in Turkish

The use of the equivalence of the foreign terms has been perceived as an important solution in academia and therefore the TDK made available the Turkish equivalence of 1948 foreign originated words using a Foreign Word Equivalence Manual. In addition to the work of the TDK, there are many studies associated with the Turkish equivalences of the foreign originated words. Major of those studies offers a synonym for the foreign originated words by taking a discipline into consideration. For instance, the synonym of the word "abacus" derived from the French language is suggested as the word "sayı boncuğu" in Turkish through the discipline of mathematics. Majority of the foreign originated words in Turkish are derived from other languages through a discipline.

Table 1. The status of the word "aba" in the table "origins"

#	origin id	word id	language id	origin word
1	38	aba	Arabic	أَبَاء
2	39	aba	Turkish	aba

It is therefore important to design a relational database which deals with the foreign originated words through a discipline. As illustrated in Figure 3, tables called "aliens", "categories" and "synonyms" were created to analyse and specify the synonyms of the foreign originated words in the Turkish language. The table "aliens" is used to store the vocabulary of the foreign languages without any inflectional morphomes. Moreover, the table "categories" shows all the discipline, in which a foreign originated word in Turkish may belong to.

Figure 3. Analysing the equivalences of the foreign originated words

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As illustrated in Figure 3, one-to-many relationship occurs between the tables "aliens" & "synonyms". and between the tables "categories" & "synonyms" since a foreign word and a category may occur many times in the table "synonyms". For instance, the word "dégénéré" exists in the table "origins" many times as illustrated in Table 2.

Table 2. The status of the word "dégénéré" in the table "synonyms"

#	synonym id	alien id	category id	synonym word
1	338	dégénéré	physics	bozulmuş
2	339	dégénéré	physics	bozunmuş
3	340	dégénéré	daily	soysuz
4	341	dégénéré	daily	yaz
5	342	dégénéré	chemistry	bozulmuş
6	343	dégénéré	chemistry	bozunmuş

5. Results and discussion

Turkish Language Association (TDK) made available the Turkish equivalence of 1948 foreign originated words on 12 July 2010 using a Foreign Word Equivalence Manual (YDKK), which is available on-line. The number of the words originated or derived from foreign languages in the YDKK was stored to the database. As illustrated in Table 3, major of foreign originated words are derived from the French language with the number of 1557 and followed by English and Italian.

However, it should be noted here that the number of foreign originated words is much more than the one illustrated in Table 3. Table 3 only illustrates the number of the foreign originated words with the Turkish Equivalence officially published by the TDK. Many originated words derived from other languages such as Arabic, Latin & Persian also exist in the Turkish language. Additionally, the Foreign Word Equivalence Manual published by the TDK also specifies the category of the foreign originated words in the Turkish language as illustrated in Table 4. As shown in the table, many foreign words are utilized in various subjects such as military, geography, mathematics and engineering. Major of the words are used in daily life of the Turkish people with the number of 1218 and it is followed by the subjects of philosophy, medicine and sport. It is also highly deemed to note here that the Turkish equivalence of 1948 foreign originated words is 2261.

Table 3. Foreign originated words based their originality

#	Language	Frequency		Language	Frequency
1	German	20	6	Latin	23
2	French	1557	7	Russian	3
3	English	287	8	Romaic	2
4	Spanish	4	9	Greek	14
5	Italian	38		**Total**	**1948**

This points out that a foreign originated word may have more equivalence in the Turkish language such as the word "agitation" used in the daily life of people and in the science of medicine. In the daily life of people, the word "agitation" used so as to describe a situation in which people

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protest or argue, especially in public in order to achieve a particular type of change and the word "körükleme" is used as the Turkish equivalence. However, it is also used in the science of the medicine to describe the outpouring of the spiritual tension and the word "çırpıntı" used as the Turkish equivalence. In sum, the Table 3 ve 4 indicate that the foreign originated words should be analysed in terms of their origin and meaning so as to design a relational database because the Turkish equivalence of the foreign originated words vary according to their roots and meanings.

6. Conclusion

The main goal of this paper is to design a relational database in order to alleviate the negative impacts of the foreign originated words used in the Turkish language because the words derived from the foreign languages spoil the structure of the Turkish language and cause degeneration. In order to design the relational database, the impacts of the foreign originated words on the Turkish language are analysed by investigating the studies in academia in terms of syntactic, lexical and morphological aspects of the language.

The findings obtained from the academic studies point out that the methodology to deal with the impacts of the foreign originated words on the Turkish language should consists of two stages namely: first, analysing the origins of the foreign originated words; and second, finding their equivalence.

Table 4. Foreign originated words based on their categories

Till	Category	Frequency	Till	Category	Frequency
1	anatomy	30	22	geology	17
2	anthropology	1	23	chemistry	36
3	military	7	24	logic	6
4	informatics	21	25	mathematics	24
5	botany	18	26	meteorology	3
6	biology	35	27	architecture	3
7	geography	22	28	mineralogy	9
8	marine	8	29	music	22
9	grammar	42	30	sprit	49
10	linguistics	12	31	cinema	21
11	religion	4	32	sport	74
12	literature	20	33	history	3
13	education	4	34	technic	8
14	economy	70	35	technology	1
15	philosophy	142	36	television	15
16	physics	90	37	trade	26
17	physiology	3	38	medicine	87
18	geometry	1	39	theater	7
19	astronomy	29	40	society	51
20	zoology	9	41	daily	1218
21	law	14		**Total**	**2261**

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To specify the origins of the foreign words in Turkish, the vocabulary and their origins currently appearing in the Turkish language, regardless of whether they are originally Turkish or not, were stored into the database for achieving the first goal of this study in three steps: (i) selecting the word appearing in Turkish; (ii) finding the language of the word derived; and (iii) writing the origin of the word (step3). After analysing the origin of the words used in Turkish, the equivalences of the foreign originated words are investigated. To investigate the equivalence of the foreign originated words, the original spelling of the foreign originated words should be stored into the database for implementing the second goal of the study in three steps: (i) specifying the foreign vocabulary; (ii) analysing the discipline of the words; and (iii) writing the synonyms of the foreign words.

In addition to the design a relational database, we have digitalised a number of best-selling national newspapers around 100,000 copies per day (e.g. Hürriyet, Milliyet, Sabah & Yeni Şafak) throughout Turkey with the purpose of discovering the daily usage of foreign originated terms. The circulation of the newspapers that was issued on November 24 in 2014 and 2015 were digitalised in order to reveal the overall tendency of the foreign originated words on the Turkish language as the daily newspapers are filled with breaking and current news. A PHP script will be designed in order to analyse and swap the foreign originated words in the digitalised newspapers with their equivalences in Turkish in automatic. The object-oriented PHP script will specify the origins of all the words in the digitalised newspapers and suggest their Turkish equivalences taking the discipline of the foreign originated words into account. Additionally, suffixes added to the end of the foreign originated words will be also swapped according to the Turkish vowel harmony (e.g. komünikasyon**suz** & iletişim**siz**). To deal with the Turkish vowel harmony, the way the end of the foreign originated words changes to show tense, plural forms, possessives, etc. will be taken into account.

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