ABSTRACT
Historical aspects of the social and technical evolution of the karaoke are presented in this paper. The implications of such entertainment device as a noise source are analyzed, mainly when it is used in inadequate conditions and spaces. The problems generated by the international introduction of Karaoke for home use is also discussed.

I. INTRODUCTION
Karaoke -in Japanese カラオケ- etymologically comes from the Japanese words: kara (空) that it means "emptiness" and oke, Japanese abbreviation of the word  ōkesutora (オーケストラ) that it means "orchestra". Therefore, karaoke means "empty orchestra". Which implies "without orchestra", that is, that the singer does not need an orchestra to sing. [1].

The word "karaoke", that in the past was only included in the Japanese dictionaries, now can be found, among others, in the “Oxford Dictionary” or in the Dictionary of the Real Academia Española.[2]

Karaoke is an A/V system in which a person sings to the microphone accompanied by an audio recording in which the voice of the original singer was eliminated. The letters of the songs appear in a screen emphasizing the words that will be sung, so that they can be followed without memorizing the lyrics of the song.

It differs from his similar, “Playback” (pretending that the person is singing by moving the mouth at the time that the sound of a recording is listened) and of singing with tracks (to sing over an audio recording without the main voice), in which these are made by professional singers, who must memorize the lyrics and take care of the performance, whereas karaoke is an activity for fans and people who only wants to enjoy themselves and that they pay for it.

Karaoke began as a form of distraction of the Japanese business people, who after a work day went to a bar with their colleagues to have a drink, and enjoy singing their favorite songs with the help of karaoke equipment. The idea was to share a drink and a song among friends and have fun. [3]

In spite of the fact that karaoke was initially a diversion used in Japan to take off stress, it grew until becoming a world-wide phenomenon for all kind of people, thanks to the technological development and globalization.

Currently karaoke is a big technological and entertainment industry that sold in the 2002, only in the USA, more than $200 million dollars in equipment and recordings for karaoke. [4]
II. BEGINNINGS

Most of the Japanese agree to affirm that karaoke was born in the city of Kobe, in Japan, at the ending of 70's. Although, this is almost a legend, says that in a bar, when the singer did not show up, to save the situation the owner of the business encouraged the people in the bar to sing with the accompaniment of a guitarist. Because of the success of making the concurrence to sing, he began to prepare recordings as a musical back up and the habitual clients of the place were going to sing their favorite songs on the pre-recorded track, beginning the popularization, which was denominated karaoke. [4]

In the USA other two versions are commonly known. One affirm that the concept of karaoke began with a program of the North American television of years 50's and 60's, in which the spectators in front of its television sang following a small ball jumping above the song text. The other mentions that in 1952 a new company of LP (Long Play) disc recording produced the first sound track to sing alone. The seal "Music Minus One", directed by a fanatic of the jazz, recorded and offered a series of discs only with the rhythm section of themes of 20's to 50's directed to the jazz improvisation, offering to the singers an opportunity to sing accompanied with the music of such musical tracks. These recordings became very popular and they were sold by thousands in USA and Europe. [4]

Irv Kratka, the founder of "Music Minus One" was recognized by the North American musical industry in 1995 as the "Father of karaoke" and currently continues producing versions of the hits for the "Pocket Songs" karaoke system.

III. KARAOKE EVOLUTION

Karaoke has evolved in different aspects, in one way adapting to the technological changes of audio and video, mainly in formats and quality, and on the other hand reaching audiences and spaces for its use and therefore extending the market.

III.1. Technological evolution of formats

The recording media for karaoke has evolved from audio magnetic tape reels and audio cassette, to the video cassettes, which synchronized audio and video. Several formats passed through karaoke with short life, like digitally recorded tapes and the first videodisc, until the CD and the DVD arrived and the computers took control. The newest ones allow us to search and skip tracks instantaneously, unlike the tapes that needed to be fast forwarded and rewound. The development of digital memories eliminates the movable parts, as the CD and DVD, improving the reliance of the equipment.

Unfortunately, because of the fast changes in the technologies and the market competition, it has not been possible to standardize a unique format for karaoke, being in the market, therefore, a variety of available media and formats (MIDI, KFN, KFP, KAR, KOK, LRC, CDG, MP3, OGG, CDG, etc.)

III.2. Karaoke Technological Evolution

Karaoke has evolved, as an equipment or system, looking to make easier to the users “shining like a star” and enjoy singing. The modern karaoke have microphones, amplifiers, speakers and video systems of greater quality at low costs, in such a way that any middle-class family can buy them.

Some additional features have been added to karaoke, i.e.: "Key Control" that allows to change the tone of the song. Another function very useful is the "Echo or Reverberation" that adds an effect to the voice so that it sounds richer and more professional, simultaneously than hides a little the out of tone problems and can give the sensation of being in a space similar to a concert hall.

Also has been included in the karaoke a "Vocal reducer" that attenuates the voices that have been recorded at centre of the audio mix in CDs or normal tapes of music.
In the new Karaoke systems, as the CDGM format, there are "Voice Cancellers" that cancels the left channel (where the voice in this format is codified), and leaves the right channel (without voices) to both sides. This takes to the function of "Automatic Voice Control: AVC", which is the vocal cancellation, but activated by voice: When a singer is listening to the voice in a multiplex disc and begins to sing in the microphone, the voice in the disc is eliminated, when it is let sing in the microphone returns the vocal guide. This characteristic is very beneficial if somebody is learning the songs.

III.3. Market Evolution

The evolution of the market began in the "Karaoke Bars" in Japan, which were directed to a social sector with money and the necessity of having fun after a stressing work day. These bars became a visit point for tourists who spread this way of entertainment to world-wide level. With the purpose of covering a wide customer range, the karaoke bars began to organize sessions of "Thematic Karaoke", that is, a type of music every night: rock, pop, salsa, etc.

Later, in the clubs in Japan, they began offer karaoke rooms, for small groups or single people, in such a way that family and friends operated the equipment themselves. These rooms ended up evolving to the "Karaoke Box", individual modules for small groups that were placed in any available space that do not produce complaints: next to highways or in uncultivated lands and in unused spaces in buildings.[5]

The first "Karaoke Box" appeared in 1984 in a rice field on the prefecture of Okayama, Japan. It was constructed in a load vehicle with his box isolated acoustically. Since then, the "karaoke boxes" have been constructed in any vacant place in Japan. On the other hand in the urban areas they were introduced dividing and acoustically isolating spaces in buildings. In a moment it was estimated that there are 100,000 karaoke boxes in Japan.

This entertainment was ideal for many types of celebrations, for which is rented karaoke equipment and only let it friends to take control of the microphone... Also it is possible to be contracted a "Karaoke Jockey", a person, similar to a Disk Jockey, who offer shows in businesses as much, as in celebrations, even for children!

Among the extravagances there are the "Karaoke Movies", popular in small circles of fanatics of the cinema, who adapted the old game to repeat classic dialogues of films, using a combination of karaoke and movies. However, if you plan to travel to Taiwan, consider the "Karaoke Travel", that cost approximately $390 dollars, and it will transport you through the beautiful landscape of the south of Taiwan, at the time that you can sing in the comfort of a karaoke wagon.

Almost from the beginning there were people who thought about leaving the karaoke to home, to relax or to practice, which represented an enormous market. With the reductions in the costs of the karaoke equipments they could arrive at house, but it was there where the acoustic problems produced by this form of entertainment began to become a social problem.

IV. KARAOKE AND NOISE... AND OTHER SECONDARY EFFECTS

The noise problems began soon due to the complaints of the neighbors. The businesses, due to pressure from the authorities, improved their acoustic design to obtain the necessary noise isolation. But when taking the Karaoke Bars to residential zones the design problem became more complicated and expensive, since most of the Japanese constructions are very near each other and that still they are constructed with poor acoustic isolation.

In order to surpass the acoustic problem, as it was already mentioned, Karaoke Boxes were created, but as they are used behind closed doors, they become an object of public preoccupation, because they can be used not appropriately by young people.

On the other hand, the promoters of karaoke affirm that many families enjoy singing together in karaoke boxes, and that can help to the families communication, which is necessary in a time in which the generational gaps and the family disintegration are an international concern.

Other important effects, although little frequent, would be the induced by the abuse in the use of karaoke, to the degree of generating a self damage to health.
In a study of the Korean researcher Min-Yong Park [6] were measured the sound levels produced when being used karaoke systems with different types of music, including ballads and rock, obtaining an average value of 95dB, with maximum levels of the order of the 115 dB, highly over the recommended safety limits for workers in the industry.

On the other hand, the analysis of the changes in the hearing threshold showed a shift of more than 8 dB in the frequency band of 4000Hz., the most important, after being exposed for 2 hours to the noise produced by karaoke.

In another study, made by Yiu, Edwin M-L & Chan, Rainy MM.,[7] of the Hong Kong University, the effect on the voice of karaoke singers was evaluated. In this study half of the singers drink water and had small breaks at regular periods when singing, whereas the other half sang in continuous form, without resting or drinking water. The results showed that those that drank water and rested, not only sang by a time significantly longer but they sounded better. While those who sang continuously showed significant changes in their capacity to sing and after a while they could not reach high notes.

This research concludes that since most of the singers of karaoke do not have formal training, and are amateur singers, they are more vulnerable to develop voice problems by the intense vocal activity that represents the abuse of karaoke.

V. KARAOKE IN HOUSES.

The business of karaoke, when trying to focus on the market of the people that do not like to drink, as well as the families, promoted the development of portable and economic karaoke equipments, which can be taken to houses or to parties.

When the Karaoke is used at home, the acoustic problem begins, and in most of the cases, at a scale that practically implies to construct the house again in order to contain the noise and prevent it from reaching the neighboring homes, which of course is rarely done and the problems of annoyances to neighbors begin, mainly at night when it is intolerable to listen the neighbor singing out of tone, microphone in hand, and disturbing our rest and sleep.

It is important to observe that commonly, the Karaoke for home are located in the living room of the houses, spaces generally communicated to the outside by windows, near which the equipment is located, facilitating the exit of the sound.

In the case of celebrations at night, karaoke is a temptation for the guests who ended up singing. If the authorities are called, and they go to admonish the moved singer, who in some cases only turns off the equipment while the authority goes away, to again turn on it later or another day.

VI. KARAOKE AND REGULATIONS

The regulation on the use of Karaoke, and fulfilling such regulations, is not an easy matter, mainly when these equipments are used in houses.

Internationally, in different countries, regulations have been established to control the noise produced by the use of Karaoke in commercial zones, that is the cases of the Karaoke bar and Karaoke box, which are based on the environmental noise regulations of the cities, which are frequently reviewed by inspectors and police. These regulations are intended to avoid undesirable effects of businesses on the community, and require a clear establishment of land use.

In societies where it is not established a clear separation and planning on the land use, the relations between the commercial zones and houses are complicated, being the noise a critical factor in the number of complaints made by the community to the authority.

The arrival of Karaoke to the houses has generated problems not covered by the regulations, which were created with other purposes. This is the reason why its application is difficult or simply they are inapplicable.

The problem begins because the equipments are sold in any commercial center or audio-video store, normally without restrictions. The user, in first instance, uses equipment bought
"legally" and directed to the home market. Of course that the buyer has not been noticed of the potential problems related to the Karaoke, nor with the implications related to where it is placed and how and when it is used, which takes to think that there is no crime to prosecute.

The regulations, in many cities are not easy to apply. In some countries they do not include the problem neighbor-neighbor, in others are not clear the penal aspects, in some places, it is a greater political problem to seize the audio equipment from the owner, and in some places the houses are untouchable places for the authority. Even in some cultures, if there is no physical contact there is no problem, etc.

The previous implies the necessity of precise regulations, clear and sufficiently specific, which can be handled within an ample context, as it would be to consider the problematic of the "audio equipment used in houses", and listing all the types and the different conditions, places and moments of use.

These regulations must specify the allowed maximum levels of noise and the procedures and equipments for measurements. It also must clarify how to make the report and the punishments for the violators must be settled down clearly, defining what person or persons these are: the owners of the equipment, the users of it or both.

As for the authorities it is difficult and politically incorrect to apply unpopular laws, it is essential to educate the society on the problems produced by karaoke by means of campaigns that educate and make awareness on: the acoustic energy as a source of invisible and remote aggression, the concept of suitable use of audio equipment, the right to have quality of life, the greater annoyance of the noises at night, etc.

Another important point is to restrict or to condition the sale to a declaration of knowledge of the injurious effects on the user and his neighbors, as a result of an inadequate use of karaoke, in such a way that the possibility of the "act by ignorance" is discarded. Also can be regulated the placement of an announcement, like the one of the cigarette packages, warning that the misuse can damage or affect the people.

On the penalties, these must be increasing, beginning by warnings, later fines and for the recidivists the regulations must contemplate seizing the equipment, although unfortunately it is an action difficult to handle politically.

VII. CONCLUSIONS

One of the premises behind karaoke is that almost all the people likes to sing in the car, in the shower, when walking, when cooking, etc. It is easy to visualize the market niche that the karaoke business takes advantage when offering to all people the opportunity of being the star.

In karaoke the rules of the game are very simple. One takes the scene, selects a song, sings watching a monitor and is acclaimed by people who don't know. Five minutes of instantaneous fame, joy with the friends, we felt well and we want to return.

The use of karaoke in places without suitable acoustic treatment, like in homes, generates that they become a noise source that bothers and affects the neighbors, mainly at night, because is not pleasant to listen people singing out of tone at all volume, in addition it disturbs the communication, the rest and the sleep.

On the other hand, in addition to annoyances, the sound produced by karaoke can affect or damage hearing and the voice of the people who abuse the use of this form of entertainment.

In conclusion, karaoke like all technological object, can be used for the wellness of the people or for its harm, even to damage the user or other listeners, reason why conscience in the people must be developed on how to use this form of amusement in a reasonable way.

Regulations must be established to control the possible misuse of karaoke. In some countries the laws are not sufficiently clear, so it is not easy to maintain the control and often the use of karaoke ends up in problems and fights between neighbors.

The regulations on the use of karaoke must be settled down as much for commercial uses as for home use. These must be precise when specifying: maximum allowed noise levels,
equipment for the evaluation, measurement procedures, which must contain the report of the measurements and the penalties for the violators.

REFERENCES


