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Management for Sustainability in Facilities: Change in a time of change

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Abstract: Is intrinsic to the functioning of our society the need for major hospitals, shopping malls, sports facilities, public transport stations, public institutions, schools, waste treatment plants etc.. This equipment must be available for use. But as we measured the consumption needs of this equipment? What is available is equal to what is necessary? There has been a study in sports structures, specifically in football stadiums and found that the availability is much higher than needed. We have no control of consumption, waste control, user awareness. But there was a high sensitivity for the invoice to pay. In an environment of global change, crisis, it becomes urgent to better and more profitable use of such equipment leveraging its positive impacts on society. In this perspective the definition of management model for the sustainability of infrastructure is needed. For all areas of sustainability are then systematized aspects that are considered priority address. Environment should be considered: water, energy, materials, waste, wastewater and environment (in particular ecosystems connection). In terms social: immersion and integration of users, information and communication for users, control and related infrastructure, awareness and training for both users and staff, ensuring safety and well-being and transport and access for users. In economic terms, all costs, maintenance, operation, waste, leaks, discharges and resources. A Management Model for Sustainability must therefore allow for Sustainability awareness of all stakeholders in the infrastructure, check the aspects most relevant to the

specificity of each infrastructure, follow the steps for Sustainability Implemented and consider what steps possible to implement. It should also be considered a dynamic control performance of the management model for sustainability, ie, enhance the use of resources, reduction of consumption in the use, control inefficiencies (losses and leakages) and users' interaction and integration. The current challenge is not for new construction, but to ensure that the existing infrastructure have guaranteed levels of satisfaction of user needs, the binding of these infrastructure leveraging the best use of these to life, with sustainability.

Keywords: Sustainability, Management, Facilities.

1. Introduction

In an era of change in which new construction, especially in Europe, is in declining phase, given the large number already built, you need a new vision, positive, existing structures. Cannot continue to have great equipment where it is considered that there is equal availability needs. This reality leads to very high costs of operating structures, both related to high consumption but also to high existing waste.

Within the large-scale structures, sports facilities particularly soccer stadiums because of its functional complexity and aggregate capacity of around one million in the same event can be considered case studies with high relevance.

The construction of football stadiums, especially in Europe has been characterized by a significant rate over the past 20 years. This construction justifies the need and demand for new rooms for the show due to various sporting events that Europe was the scene in recent years and next year: London Olympics and Euro 2012 in Poland and Ukraine. Being a theater stage with a high frequency scaling, and your entire project takes into account the guarantee of availability.

In 2006, FIFA - Federation International de Football Association, has developed a guide recommendations and requirements which indicate four key strategies to consider for the sustainability of the new stadium project: implementation of strategies to reduce consumption of potable water, strategies for prevention and reduction of waste, creation of more efficient energy system and promoting the use of public transport.

In Portugal were built eight stadiums for Euro 2004, and its construction was concluded in 2003. In recent years several reports were published concerning the operating costs of the stadiums built for Euro 2004 and its occupation to tiny planned events, football matches.

In the case of municipal stadiums with is the situation worsened as residents and clubs do not have the investment costs have been supported in part by the municipalities. There was even distribution of proposed sale of stadiums and equated its demolition.

It is considered that this reality can be extended to other countries, and may be an example to improve the stadiums that are currently under construction or planned.

So you want to check first the current situation of football stadiums in Portugal in relation to sustainability in their management. What measures have been proposed since considered, which have since been implemented and what is considered possible to be implemented.

Through surveys developed for this purpose could be made to assess the current situation of the Portuguese stages in relation to sustainability. It should be noted that investigations were made to the responsible management of stadiums and their direct employees.

2. Method

Different surveys were developed and various forms of interaction with the managers of stadiums in order to be able to collect information in an easy and systematic about the sustainability of the stadium.

The study presented here intends to make a first approach to the current state of Portuguese football stadia and ways to enhance the sustainability of these structures.

In a first approach we developed a survey where you want to set several parameters related to sustainability and the managers of stadiums define a scale of 1 to 5, where the lowest ranking for each aspect most relevant.

So we intend to check the current concerns and measures implemented for the various aspects of sustainability, as well as sensitivity to the relevance of various phases of the life cycle of infrastructure.

Further analysis was presented at the Workshop held at the Portuguese Association Stadium in October of this year, where he placed the following challenge to the managers of six stages represented: Imagine that she was asked to give information to an advertising campaign entitled "Our Stadium and sustainable, "with what is already implemented in the current Stadium.

Was asked to be written short sentences, with four words maximum, and set for 3 components of Sustainability, Environment, Social, Economic, two aspects where it is being promoted its growth and where the two aspects to promote their reduction.

The intentions with this proposal see which aspects of sustainability which are now seen and what the sensitivity of the managers of stadiums for Sustainability and understanding of its various components.

Carried out investigations was an analysis of the responses are presented and analyzed the results of a systematic way.

In the case of the survey are presented directly the minimum, average and maximum for each parameter analyzed.

For the ad campaign because the results are the same texts, an analysis was made of the points being presented as a percentage for each parameter considered more important by the managers of football stadiums.

So are the results obtained to date, however there is a need to progress the development of research to get as much information as possible.

3. Results and Discussion

For the survey that was made to the directly to the managers of football stadiums, are systematized in the following table results. Indicated values are average minimum and maximum that were defined,

taking into account the scale of 1 to 5, with 1 representing the value of little importance and 5 defines what is considered very relevant.

1. Sustainability of the stadium has to do with	Minimum Value	Mean Value	Maximum Value
Environment	3	4	5
Economy	4	5	5
Social	4	4	5
2. Sustainability of the stadium should be made	Minimum Value	Mean Value	Maximum Value
Project	5	5	5
Construction	3	5	5
Exploration	3	4	5
Dismantlement	1	3	5
3. Sustainability Stadium Exploration, Costs	Minimum Value	Mean Value	Maximum Value
Resouces	4	5	5
Consumables	2	4	5
Equipments	2	4	5
Infrastructure	3	4	5
Wastes	2	3	5
4. Sustainability Stadium Exploration, Resources	Minimum Value	Mean Value	Maximum Value
Water	4	4	5
Electricity	5	5	5
Gas	3	4	5
Other	3	4	5
5. Sustainability Stadium Exploration, Water Resource	Minimum Value	Mean Value	Maximum Value
Efficiency of devices	4	5	5
Control of Use	4	5	5
Leaks Control	4	5	5
Rainwater Harvesting	3	4	5
Waste Water	3	3	5
6. Sustainability Stadium Exploration, Resource Energy	Minimum Value	Mean Value	Maximum Value
Lighting	4	5	5
Heating / Cooling	5	5	5
Hot water	3	4	5
Control of Use	4	5	5
Use of renewable	3	4	5
7. Sustainability Stadium Exploration, in the Maintenance	Minimum Value	Mean Value	Maximum Value
Greensward	3	5	5
Air conditioning	4	5	5
Lighting	3	5	5
Equipments	3	4	5
Infrastructure	3	3	5
8. Sustainability Stadium Exploration, Waste	Minimum Value	Mean Value	Maximum Value
Municipal Solid Waste	3	4	5
Recycling	4	5	5
Reuse	3	3,5	5
Hazardous waste	1	1,5	5
9. Sustainability Stadium in Exploration, may lead to	Minimum Value	Mean Value	Maximum Value
Investment	4	5	5
Maintenance costs	3	5	5
Control	4	4	5
Information to the Uses	3	4	5
Interaction with users	3	4	5
10. Dynamics of Performance Management Sustainability	Minimum Value	Mean Value	Maximum Value
Consumption monitoring	4	5	5
Control of Use	3	4	5
Efficiency of use	4	5	5
Availability of Results	3	4	5
Dissemination of results	2	3	5

Table 1. Systematization of the values obtained Survey made directly to the managers of the football stadium.

The direct survey can be seen that the economic aspect of sustainability is the most relevant, since it is probable that interventions in the other two components can influence the economic sustainability of the equipment.

Regarding the phase of the life of the structures which should be considered in the project's sustainability. It was noted that several conditions that now present themselves in the exploration phase is not expected due to these aspects in the project. Project is expected to be much easier to exploit for Sustainability.

Stadiums in the exploitation of the costs considered most relevant are those related to resources used. There is a notion that the component of the monthly bill on resources consumed is presented with the greatest contribution.

Within the resources that are consumed electricity is considered a priority because the bill is higher. It is therefore the most relevant aspect to the equation of sustainability in the exploitation of sports equipment.

For the water feature there is a relevance to the equity aspects of efficiency of the devices, control the use and leakage control. Standing water in the background in relation to the invoice amount, its relevance, even if indirectly affect energy consumption is not so considered.

In the case of the highest energy bill of exploitation is the heating and cooling. It is considered that the design of equipment was made for maximum capacity and there in case it becomes impossible for slicing functional areas, which leads to high consumption.

The climate is the most important aspect considered in the maintenance of the stadium. As mentioned previously may have existed in the project is not expected to flexibility of the system throughout its operation, exploitation and associated maintenance becomes difficult.

In waste recycling presents itself as the most relevant. It appears that taking into account the existing functional peaks in the stadium, there are needs of different capacities throughout the month. It is agreed that in the days of the game becomes very difficult to separate waste for recycling and I am forwarding. During the current operation of the stadium recycling is carried out effectively.

When asked what sustainability can lead in the Exploration of the stadiums they find most relevant is the potential investment required. However it should be noted that, in stages Portuguese who were the target of investigation in technical analysis and financial measures for Sustainability have been made in a very timely legally required only for aspects.

Finally, the dynamic control of sustainability management is also considered relevant to the monitoring of consumption and fuel efficiency. Consider that in the event of measures being implemented for Sustainability must be made to monitor its effectiveness, however currently only controlled aspects related costs.

For Advertising Campaign results were analyzed taking into account the aspects discussed, which are being implemented in football stadiums in relation to sustainability.

In relation to the environment in 100% of campaigns define the reduction of energy consumption. Water is also referenced in 100% of the campaigns; however 66% reported a reduction in consumption, 17% control of leaks and another 17% mention the heating of water through Solar Thermal. Waste is also noted in 100% of the campaigns, of which 83% related to the selective separation and recycling and 50% reduction in production. There were other aspects that were presented in a way not so significant but there must also be presented: the arrangement surrounding the

stadium, using public transportation, composting, dissemination of good practices and positive attitude and hygiene.

For the social component, 66% of campaigns reported liaison with the community. The awareness and social integration were presented 50% of advertising campaigns. Equal to 34% of the costs associated with staff and issues related to reduced mobility. One aspect was occasionally referenced the need for reduction of architectural barriers.

Finally, in economic terms over the matter was referred to the reduction of costs and can be subdivided into 34% of overall costs, another 34% to the cost of maintenance / operation and 17% for both the reduction of liability as to the energy bill. In 50% of cases were presented to increase revenue and to diversify the business areas. Finally 34% of campaigns reported an increase in jobs.

It appears that this campaign and Economic Environment components are considered the most relevant, considering that this emphasis is due both to legal requirement, however, the component of costs is largely cross the proposed advertising campaigns.

4. Conclusions

It is considered that from the results obtained to date there are already some guidelines for sustainability needs of the football stadium. However it turns out that should be continued research to verify the whole of football stadiums.

As a first general conclusion of this analysis is that the social component of sustainability is less considered. There is still very little connection between the management model of the football stadium and its users. Thus aspects of Social Sustainability are still not relevant to the Football Stadium, even though this stage of events where there is a representative of society. It is considered that this should be further studied, worked and released so that the equation of Sustainability is equal to its relevance to the other two aspects, Environment and Economic.

It appears that this time of change, crisis, all aspects related costs have to be addressed, yet still there is little sensitivity to issues of sustainability or that this can lead to lower bills.

It is manifested by the different administrations of Football Stadiums that models of management of a private structure, belonging to a football club, and a public structure, owned by a municipality are distinct. So we intend to develop a systematic approach for the different management models.

Analysis of the measures advocated for sustainability in stadiums that were built or are being constructed following the recommendations of FIFA, it may be a way to check the possibilities of measures for the sustainability of football stadiums that are already built, yet has to be carried out technical and financial analysis to this reality.

It is considered that the sustainability of the farm it is possible, should be an analysis of technical and financial measures advocated and monitored their progress in the life of the infrastructure in order to be considered an effective sustainability. There must be a change of attitudes and perspectives to ensure that the costs of life of major infrastructure projects do not exceed the initial investment of its construction, enhancing their sustainability positively and actively.

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Conflict of Interest

"The authors declare no conflict of interest".

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