GIS TECHNOLOGIES FOR THE ANALYSIS OF THE OFFICE'S PROPERTIES IN BARCELONA.

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ABSTRACT : The changes in the characteristics and needs for space for the economic activity, the increasing predominance of tertiary industry of offices or I+D, produced for the economic changes, implies new forms, new technical characteristics and similar alternative locations to a changeable and increasing demand.

This work makes the bases to a geographical information system channelled to the property geo-marketing for office blocks in Barcelona, which allows the necessary information on the constructive and technical characteristics of the office blocks, summoned in the most emblematic locations of greatest centrality or of greater technical level in its constructions towards facilitating the maximum knowledge to the citizen in order to assure the choice but suitable according to the needs for every profile of demand.

This work consisted basically in the definition of technical criteria to evaluate the buildings, to systematize those characteristics in some indicators (variables) capable of expressing the level of quality, to establish a system of measure for bigger to smaller values explained by quality. Systematizing the collection of information of a total of 683 buildings of Barcelona and of some municipalities of its periphery, through a visit to every building, to process the data obtained to a database and to standardize the value of quality for every indicator and set of indicators towards determining a final qualification, obtained from the different physical, constructive and qualitative characteristics of every studied building.

Finally an analysis of them is carried out according to its location, according to certain parameters that differentiate them and itself realize an analysis according to a statistical model of hierarch zing of them.

1.- GENERAL CONTEXT

The developed work tackles, in the first place, the elaboration of a base of information qualitative and homogenized of the characteristics of the office blocks, applied to its different regimes of property, vertical or horizontal line, which constitute an important part of the total built in real offer destined for the location of tertiary activity in our cities.

In the case of Barcelona a methodological exercise is tackled of description and tabulation of the different components that this type of constructions describes level of comfort according to the characteristics of the space, functionality, equipment, facilities, and adequacy to the needs for the demand.

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On the base of a specification sheet of the building, in that the clear and systematic criteria are poured to judge and to mark in a segregated way the different aspects that affect a meditated evaluation of a specific property product, attending to all of them and each of the factors and to the analysis pondered of its incidence to a greater adequacy of the same one to the most current standards, a final note of evaluation of the product is obtained as result.

In second place, it tries to relate the products observed, in its urban position, with the hierarchy agreed on of tertiary axes of the city, that is, the quantity and type of product is found in every area of the city. Attending to the hierarchy of tertiary axes, of areas it has priority, areas adjacent to centrality, intermediate urban areas and peripheral areas bound to medium-sized cities or to technological parks. It is a matter of clarifying, through a comparative analysis, in that measured a specific product is adjusted to the suitable characteristics to the place in which it is summoned.

In third place, it is a matter of exploring in which measured the differential characteristics of those products, the buildings situated in the axes but central are adapted to the significance level of its urban site, that is, more emblematic of some cities incorporate the necessary elements of technical increasing and services tied up with the building, which predictably requires the demand.

Evidently in the course of the time the cities have seen to evolve its urban centers, so that with time determined buildings, which have been appreciated by its architectonic singularity or its innovative concept of the diaphanous space, lighting and services, become with time little profitable buildings by the appearance of new and but advanced built structures endowed with technologies that are adapted better to the new business needs.

Also the transformation the urban tissue, as consequence of the growth or increase of densities of some urban centers, the transformation of activities, the disused overturning or the decay of specific spaces, give impulse to the need for regeneration, of urban tissues. These performances directed to regenerating specific urban areas, to create new polarities as centers of attraction, in emergent spaces are constituted following individual performances in a ground already urbanized (big industries, or obsolete enclosures), in performances of more general character, as the case of the BCN 22 @ modifying the planning of an important fragment of the urban space or also for the incorporation of new urban developments (the example of polygons or technological parks).

In fourth place, considering the before indicated transformations, it is a matter of judging the weight or the appeal of specific tertiary axes of the city, with the quantity and profile of constructions, towards illustrating the foreseeable transformations into the edificatory types that they receive. Even though the most consolidated axes, the traditional center, with emblematic axes to the style of the Castilian or Boulevard of Grace, are indisputable, the changes in the business models or in the situation profile but suburban of the economic activities, foresee relevant changes in the location and the level of demand of technical increasing and services in the properties of greatest centrality.

A following step consists in establishing factorial statistical measures that outline criteria of qualitative differentiation among the elements studied, paying attention to urban areas. It is treated of competence ranges, with regard to the quality of the buildings in comparable locations, determining to extract criteria about components being the most relevant and also the most singular.

Determining the elements of quality that increase its position relative or of ranking, with regard to the other built products. With the comparative analysis to giving priority of properties, it's defined the characteristics and a pondered score.

Finally the elaboration of a model of emulation of the market that allows to assign of probable values (or of rents) of the buildings incorporated in the system, attending to the constructive variables, of zone or parameters fabricated about this through the Centre of Land Policy and Valuations.

2.- SCHEMA OF THE STUDY

The study is organized in working schematized phases in way of taking a more detailed control and a better visualization of the advance of the project.

2.1.- *Phase 0. Previous studies*

Creation of a base of complete information of the buildings to study, which incorporates data of the building as postal address, owners/ administrators, denomination of the building, price/ rent and other information. From preliminary information that arranges the company, a new base (in all the revised contents integrating) is completed, unifies a new base (in all the revised contents being integrated) and is built.

On a first version of specification sheet an analysis and correction of contents, as well as an explanatory text like manual of use of the specification sheets are carried out, revised documents that incorporate new thematic being generated.

2.2.- *Phase 1. Compilation, verification and selection of information*

The definition of the municipalities to study comes previously specific for the needs of information of the SGMI and is summarized in the following, Barcelona, Esplugues de Llobregat, Molins de Rei, Sant Joan Despí, Sant Just Desvern, Cerdanyola del Valles, Granollers, Manresa, Martorell, Sant Cugat del Valles, Terrassa, Cornellá de Llobregat, El Prat de Llobregat, Hospitalet de Llobregat and Sabadell.
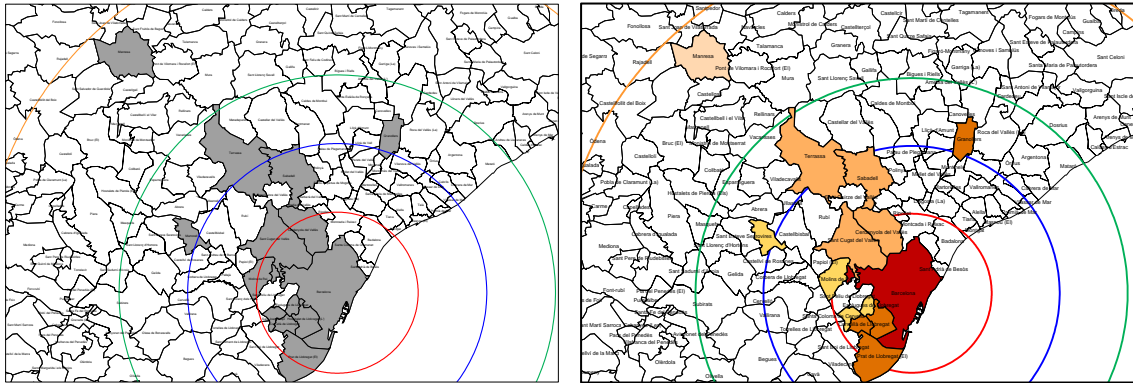
Figures 1 and 2: Municipalities included in the study and maps by pollster.

It is determined as general criterion, to visit all the buildings that are of use exclusive to offices, that mostly are collected in the initial database, the compilation of information is proceeded according to the criteria specified in the specification sheet, collected in the manual of use of the specification sheets and agreed by expert connoisseurs of the demand for offices.

Once the verification of the preliminary listings has been carried out, number of visits is established in the following ones by the bases of collection of information for municipality.

| MUNICIPALITY	TOTAL
BARCELONA	378
ESPLUGUES DE LLOBREGAT	19
MOLINS DE REI	12
SANT JOAN DESPI	4
SANT JUST DESVERN	21
CERDANYOLA DEL VALLES	31
GRANOLLERS	15
MANRESA	23
MARTORELL	10
SANT CUGAT DEL VALLES	25
TERRASSA	20
CORNELLA DE LLOBREGAT	17
EL PRAT DE LLOBREGAT	8
HOSPITALET DE LLOBREGAT	28
SABADELL	24

Table 1: Initial quantities of collection for municipality of the study.

In the case of Barcelona an initial location of each of the points, for districts, is carried out for the purpose of organization of the visits of the pollsters for the study.
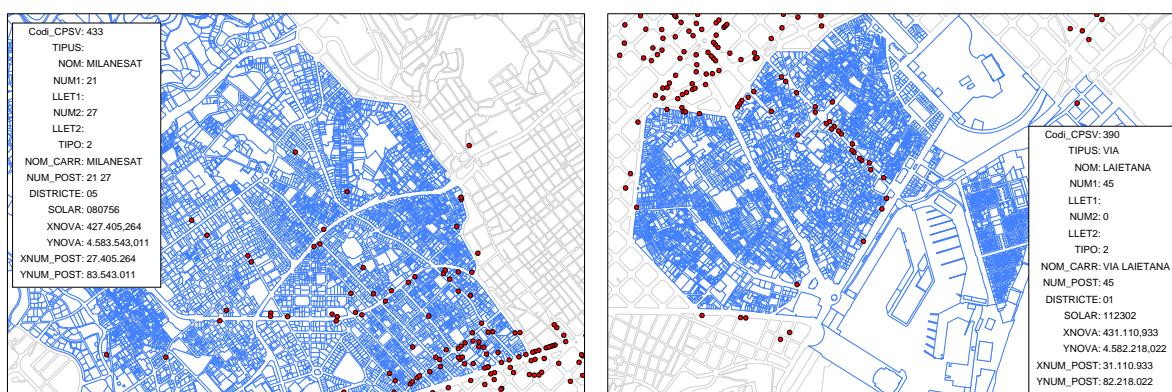
Figures 3 and 4: Plans of location of points of buildings of Sarriá Sant Gervasi and Ciutat Vella..

In the case of the peripheral areas it is determined that in the case of finding, during the field tour, new buildings that present the required characteristics, these can be added if they are in some industrial estate or business park and that they correspond to office blocks for rent and they comply with the adequate constructive conditions.
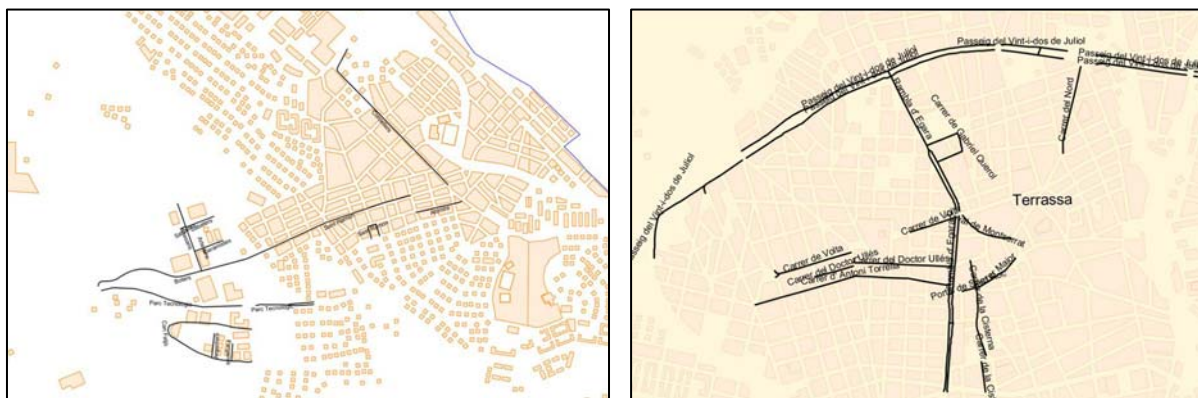
Figures 5 and 6: Plans of axes buildigs location in Cerdanyola del Valles and Terrassa

The visit has been carried out to about 683 properties, compiled new data of complete information for a total of 530 Cards of Technical Information of the buildings, like this as has been detailed in every case the concept for which it has been unsuccessful the taking new data; residential building, imprecise address, building of institutional use, etc. For these cases a code that explains the cause of its discard as a case of analysis, according to the table that is next presented, has been defined.

ESTATE	CODE
OFICINAS / RECOGIDA DE CAMPO HECHA	01
EDIFICIO MIXTO	02
EDIFICIO DE VIVIENDAS	03
EDIFICIO COMERCIAL	04
EDIFICIO EN CONSTRUCCION	05
EDIFICIO DEMOLIDO / SOLAR VACIO	06
DIRECCION INEXISTENTE / NO CORRESPONDE	07
IMPOSIBLE ENTRAR AL EDIFICIO	08
EDIFICIO INSTITUCIONAL Y / O USO PROPIO	09
DIRECCION REPETIDA	10

Table 2: Definition codes of the property state, according to its current use and been of accomplishment of the specification sheet.

2.3.- *Phase 2. Design of database and contents towards statistical analysis*

In this stage two structures of databases differentiated according to type of *vertical property* (an owner of all the property) or *horizontal property* (in property for plants or sites) are defined, the data are processed and the algorithms corresponding to the consideration of the descriptive variables of the building are deposited attending to the technical criteria of being predefined. So can relate the relative descriptive characteristics of the buildings to: the functionality of the space, quality of the facilities, comfort, quality of the finishing, image, situation, parking, norm of safety among another, with a measure of the appreciation that the market confers it to every parameter. This adequately coded information, is processed for its computer treatment in layout Excel, attending to the working system SGMI.

Have been verified the data at alphanumeric level, creating the Specification Sheets of Exit (Access) that through consulting, are capable of extracting from the standardized data, the values pondered of the different constructive characteristics of every I build in layout of Report of Access.

Figures 7 and 8: Model of layout cards of every building. Reports developed in Access database

The descriptive contents of every specification sheet, provide a general reading of the different profiles of office blocks, according to the existence or not, of specific characteristics studied in the buildings of vertical property, as well as a final note that expresses the level of technical increasing or else of appreciation to the demand for office blocks.

The statistical treatment (SPSS) of the individual variables (but of 50 descriptors) or else of the attributes grouped together (9 subjects differentiated previously), they allow establishing an order among the factors that have a greater incidence in the appreciation of the market.

2.4.- *Phase 3. Elaboration of models*

Once different statistical analyses of correlation of factors have been developed, a statistical model is carried out attending to the characteristics of the buildings and signification of its location.

The determination of factors for the elaboration of the model consists basically of an analysis of the components who consider themselves definitive in the final note and who after carrying out the analysis detect each other as the most significant.

So that in the constructions in vertical property, to part of the location, it is appreciated as aspects tied up with the transparency of the space, to the control of the acclimatization, the representative and well preserved façade, the telematic services, and the coating of the ground are the aspects but determiners in the choice of the demand and consequently to the availability to pay, or level of rent.

In more added way, also in constructions in vertical property, they send the set of descriptors of the functionality of the space, the quality of the finishing, the availability of parking, and the situation of the building, as the most significant aspects.

In the case of buildings in horizontal property, they take relevance the arrangement of porter's office, the representative and well preserved façade, the direct access to the offices, as elements but outstanding.

In an appreciation added of variables in buildings in horizontal property, the hall with all is situated his characteristic (geometry, natural lighting, architectonic characteristics and services), also the arrangement of parking, and the image of the building as factors but relevant.

In short, the resulting models allow establishing some levels of rent (rent) explained to office blocks of Barcelona, comparable to the position and characteristics of the existing buildings or to future introductions of studied constructions placed in the areas especially. Likewise, one may stand out that in so far as in many cases the studied constructions present improvable constructive and technical characteristics, often occupying locations of first order, the model can be used as approach to the determination of new rents attributable to an improved construction, as measure of study of the possibilities of investment in the rehabilitation of its space towards an improvement in the future profitability.

2.5.- *Phase 4. Selection and validation of the models*

In this stage the checking of statistical validity of the models suggested, as for statistical systems, as well as for analyses carried out with the implemented GIS application, is carried out.

3.- ANALYSIS ACCORDING TO THE OBTAINED DATA

The analyzed aspects consider the constructive characteristics, technological and environmental, variables that define the type of construction significantly, the appreciation of the building in relation to the rest of products and to the environment in which the manages.

On the initial base, composed of 683 buildings, 378 in Barcelona and the rest out of the municipality, the constructions are studied with the use of offices that have 80% of approximate surface destined for such a use, and in regime of vertical property.

A qualitative measure of the characteristics of the buildings is established taking the score pondered of the data of the card of collection of information, groups together by section to obtain the qualification in each of the three characteristics analyzed, through the average of the variables taken into account for its construction. The total of the analyzed sample, Barcelona and periphery, reaches 547 cases of constructions studied in four sectors, for their respective analysis, area Barcelona red, rest of Barcelona, Periphery Technological Parks, and rest of Periphery.

With 352 cases, Barcelona absorbs 64,35 % of the sample, of that alone 10,60 % is placed in the area it has priority, of first order or red area, whereas about 195 cases, are located in the environment of Barcelona, the periphery that absorbs 35,65 % of the sample. This is the reason for which the biggest quantity of cases are found in what is named the rest Barcelona (BCN), in which more of half of the total of the studied buildings is placed.

The exception precisely we find it in the buildings of extreme qualification, that is the count with qualification but high and those that counts with the lowest scores. The buildings with higher score (9-10), only 15 buildings that represent 2,94 % of the total, of those that tend to be situated in the Technological Parks of the periphery 40 %. On the other hand the buildings with lower qualification, that is those that count below the 4, with a total of 8 cases, are placed by 62% in what we have named rest periphery.

In the exceptional axes of Barcelona, red area, a wide profile of buildings is found with scores that from 5 to 9, with an important weight of those that oscillate between 5-6 oscillate, of profile but simple that 7-8 that concentrate 27,59% of the cases concentrate 29 % of the cases, and also of an important stock of buildings of good score.

The office blocks situated in the rest of Barcelona, to part of main axes, constitute the thick one of offer of this type of properties with a total of 294 cases, of which the one 56,80 % present a good average qualification among 6-8, represented for 167 buildings.

Zones		Punctuations distribution							
		<4	4-5	5-6	6-7	7-8	8-9	9-10	*Totals*
Barcelona	N° cases	0	1	17	12	16	11	1	58
Red Zone	% Zone	0	1,72	29,31	20,69	27,59	18,97	1,72	100,00
	% Final	0	2,17	15,74	9,23	10,13	13,41	6,67	10,60
Barcelona	N° cases	3	24	53	75	92	43	4	294
Others	% Zone	1,02	8,16	18,03	25,51	31,29	14,63	1,36	100,00
	% Final	37,50	52,17	49,07	57,69	58,23	52,44	26,67	53,75

Table 3: Final qualifications of the buildings in Barcelona

The buildings situated outside Barcelona, in the periphery, are found located in one good part 43% in Park technological. These Parks concentrate a stock with good scores focused between the 7th and the 9th, more of 64 %.

Zonas		<4	4-5	5-6	6-7	7-8	8-9	9-10	Totales
Periphery Technologies Parks	Nº cases	0	7	11	12	30	18	6	84
	% Zone	0	8,33	13,10	14,29	35,71	21,43	7,14	100,00
	% Final	0	15,22	10,19	9,23	18,99	21,95	40,00	15,36
Periphery Others	Nº cases	5	14	27	31	20	10	4	111
	% Zone	4,50	12,61	24,32	27,93	18,02	9,01	3,60	100,00
	% Final	62,50	30,43	25,00	23,85	12,66	12,20	26,67	20,29

Table 3: Final qualifications of the buildings in periphery.

Besides the analysis of the general qualification of the building the contribution of the most significant variables, to observe whether the behaviour of each is different in the studied areas and to identify the own weight in a compared way, and its incidence in the final score is studied.

In the first variable the Constructive Quality is studied, from aspects corresponding to the Functionality of the space, according to its geometry, transparency, arrangement and dimension, the elements of Comfort, following subjects of natural light and soundproofing, and the of Quality of the finishing, evaluating the types of coatings in the construction and its easiness of maintenance.

Distribución Zonas	Distribución de puntuaciones								
		<4	4-5	5-6	6-7	7-8	8-9	9-10	Total
Barcelona Zona Roja	Nº de casos	0	1	6	12	22	16	1	58
	% Zona	0	1,72	10,34	20,69	37,93	27,59	1,72	100,00
	% Calidad Construc	0	10,00	11,11	7,45	10,48	17,39	5,26	10,60
Barcelona resto	Nº de casos	0	6	25	86	131	42	4	294
	% Zona	0	2,04	8,50	29,25	44,56	14,29	1,36	100,00
	% Calidad Construc	0	60,00	46,30	53,42	62,38	45,65	21,05	53,75
Periferia Parques Tecnológicos	Nº de casos	0	0,00	8,00	24,00	23,00	21,00	8,00	84
	% Zona	0	0,00	9,52	28,57	27,38	25,00	9,52	100,00
	% Calidad Construc	0	0,00	14,81	14,91	10,95	22,83	42,11	15,36
Periferia resto	Nº de casos	1	3	15	39	34	13	6	111
	% Zona	0,90	2,70	13,51	35,14	30,63	11,71	5,41	100,00
	% Calidad Construc	100,00	30,00	27,78	24,22	16,19	14,13	31,58	20,29
Total	Nº de casos	1	10	54	161	210	92	19	547
	% Zona	0,18	1,83	9,87	29,43	38,39	16,82	3,47	100,00
	% Calidad Construc	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Table 5: Construction qualities of buildings.

Most of the constructions with scores that oscillate among the 9-10, that is, the exceptionally good products as for constructive quality is referred, are found placed in the periphery, stands out the high level of concentration of these buildings (about 19 as a whole), but of 73 % they are in the technological Parks. Of the set of properties that receive the Technological Parks 80 % is marked between the 6 and the 9 points.

As for the constructions with one 8-9, qualified as very good, the red area of Barcelona and the Technological Parks stand out, for offering among its products an important part of buildings in this group (28 % and 25 % of its products respectively).

The oldest part of office blocks bring together a good constructive quality with a score that goes of 7 to the 8 points, a good product, of which 210 buildings of a total of 547, finds in Barcelona,

of which 131 are found in what we have called rest Barcelona, sector for the one that most of its products, qualify between the 6 and the 8 points.

Among what is named as normal product, the qualified one with one 6-7, in the one that we find a total of 161 buildings, 7 % are only placed in the red area of Barcelona, while the thick most relevant 53 % is found distributed in the set of Barcelona. Likewise, this type of product predominates more in the rest of the periphery 24 %, that in the Technological Parks 14 %

The incidence of the characteristics Technological, on the general score, is studied following the qualification by which systems of acclimatization have been assigned to the subjects concerning to the services of communication as the optical cable, aerials, reserves of phone lines, to her in the construction, to the electricity, its organization and homogeneity in the lighting, to the systems of communication and control of the safety of the building, interiorly and exteriorly, all this counted by coincident groups in the specification sheet through the section of quality of the facilities, and its distribution according to its level of technical increasing, more, moderately or less technical characteristics.

Distribución Zonas	Distribución de puntuaciones							
		<4	4-5	5-6	6-7	7-8	8-9	9-10	Total
Barcelona	Nº de casos	0	2	9	11	14	20	2	58
Zona Roja	% Zona	0	3,45	15,52	18,97	24,14	34,48	3,45	100,00
	% Variable 3. Tecnil	0	5,71	19,57	14,29	9,15	13,89	3,70	10,60
Barcelona	Nº de casos	23	19	21	41	83	86	21	294
resto	% Zona	7,823129	6,46	7,14	13,95	28,23	29,25	7,14	100,00
	% Variable 3. Tecnil	60,52632	54,29	45,65	53,25	54,25	59,72	38,89	53,75
Periferia	Nº de casos	3	6,00	6,00	5,00	23,00	18,00	23,00	84
Parques Tecnológicos	% Zona	3,571429	7,14	7,14	5,95	27,38	21,43	27,38	100,00
	% Variable 3. Tecnil	7,894737	17,14	13,04	6,49	15,03	12,50	42,59	15,36
Periferia	Nº de casos	12	8	10	20	33	20	8	111
resto	% Zona	10,81	7,21	9,01	18,02	29,73	18,02	7,21	100,00
	% Variable 3. Tecnil	31,58	22,86	21,74	25,97	21,57	13,89	14,81	20,29
	Nº de casos	38	35	46	77	153	144	54	547
	% Zona	6,95	6,40	8,41	14,08	27,97	26,33	9,87	100,00
	% Variable 3. Tecnil	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Table 6: Technic level of buildings.

It is appreciated that from the point of view of the technology, almost 60 % of the products subject to this analysis, are good and very good, that is those that oscillate between the 7 and the 9 points, and alone 21 % of the cases, are products that finds below the 6 points. With regard to the red area of Barcelona, its buildings offer a good level of technical characteristics. approximately 50 % of the buildings situated in the area, although respect the set of studied properties, the location of Technological Park are better in this variable, more for of 75 % it has a good level of technical characteristics.

In the rest of Barcelona a significant percentage, 8 % of its buildings qualifies as exceptionally good, almost 60 %, 169 of a total of 294, qualify between the 7 and the 9 points, and 22 % qualifies below the 6 points.

In the group of buildings with higher scores, 42 % of the 54 counted cases are highlighted singularly, the ones placed in the Technological Parks, among one 9 and one 10. A percentage equally high (38 %) of buildings with this score, are placed in the rest of Barcelona; it catches the attention, the few quantity of cases that from this point of view, are highlighted in the area red of Barcelona, alone 2 on the whole of the 58 buildings.

The analysis of the Situation and the Environment, in which the variables of measurement are related with the image of the building and of its common interior spaces, as the building its singularity is highlighted in the environment, facilities of site and of access, considering of easy access when this close to main lines, the services with which it counts the area, the proximity to nets of communication, as well as its quality and variety, and the quality of the neighbours, all that through the sections of quality of the finishing, image and situation, the degree of consolidation of the environment is studied equally, discriminating among recent areas, modern areas and ripe and consolidated areas.

A total of 51 buildings are the ones valued as exceptionally good, of which almost it's whole, 88 % they are concentrated in Barcelona, and likewise, we observe in this group the absence of products in the Technological Parks. In the red area of Barcelona, 56 of the 58 cases, they are buildings catalogued as exceptionally good, that is, valued with qualifications above the 7 points, 18 % counts between the 9 and the 10 points.

In the group of products catalogued as very good (8-9), 174 buildings, of which a major proportion is placed in Barcelona, 76% approx., figure that contrasts with 24% of buildings disposed in the periphery, 14% of these is placed in Technological Parks.

With regard to the rest of Barcelona, products with scores that oscillates between the 7 of them and the 9 points, percentage that it increases when adding 10% of cases valued between the 9 and the 10 points, a significant figure, 240 of 294 buildings placed in the margin of a quite positive valuation for him, are 70% of the cases. In the qualifications among the 6 of them and the 8 points we start to observe that the concentration highest of buildings is placed in the rest of Barcelona and in the periphery.

Finally, an analysis segmented of each of the three studied variables, allows contrasting the differences but noticeable of each of the variables with regard to the average of every building according to the area that they belong to. Like this it is done obvious as the Situation of the Environment, assumes a relevant role in the buildings of Barcelona, either the area red or in its surroundings, to a remote significant of has been observed in periphery, two points above, precisely in the red area of Barcelona the situation and the environment is the only variable that is placed above the average, similar situation in the rest of Barcelona in which it equally tends to be the better valued variable.
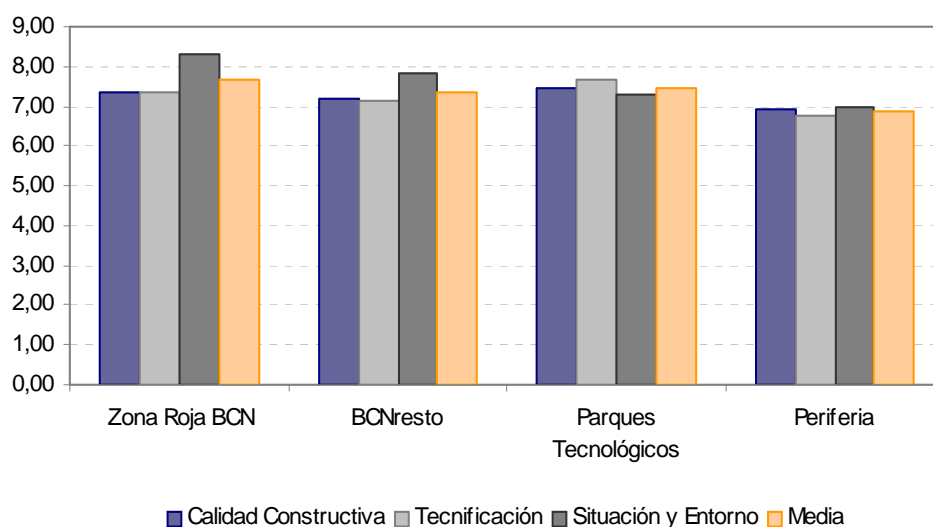

Figure 9: Análisis graphic by sectors and médium values..

The evaluation of aspects dwells in relation with technology, the dwells distinguished constructions seem to be please un Technological Park, un where the average have very similar behaviours with the variable rest of the, alone the technology surpasses un to timid way the average of the sector.

The rest of the periphery which the average variable values for ploughs please below the seven points, the technology variable is the only please below the average.

4.- GEO-REFERENCE AND MAPPING OF THE CASES PROCESSED

On the base of the generated initial planes of collection of information, with the location of the main axes for every municipal term and of touristy planes of the cities, the pollsters place the points of every case.

With this background and with the graphic databases of TeleAtlas in shapes format the base of points for all the periphery in the coordinate system UTM 50 area 31 is generated, in that they are had the points of Barcelona.

The data individualized of every property are located, on the digital cartography assigning a geographic coordinate for every building in order to contrast qualitative aspects of the buildings, with geographical referents (of proximity, urban characteristics).

Once the points have been generated on the base of the location, its coordinates, in way of working them as a whole with the cases of Barcelona, for the purpose of visualization and of knowing its specific location in every case that the generation of the maps of analysis allows us to future are defined.

Descriptive Maps of Location of the Buildings on the total of the area of study, separated in PERIPHERY and BARCELONA, those that deliver a general vision of the distribution of the sample, are fabricated like this. Likewise the Maps of Analysis of the Buildings are fabricated for Ranges of Evaluation on different areas of the periphery as well as of Barcelona. In these the location of the studied cases differentiated from each by ranges according to the final note is shown.

In periphery they are grouped together by adjacent or near municipal terms, what delivers seven areas us and in the case of Barcelona in three areas in the city.
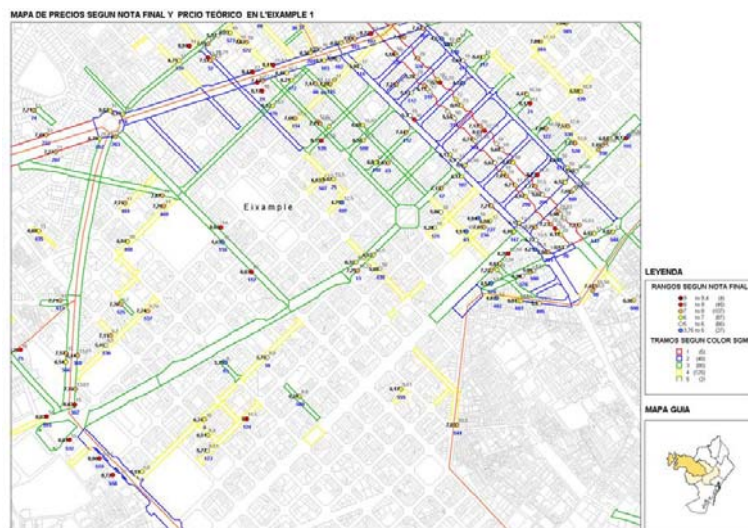

Figure 10: Map of price according to final note and theoretical price of sector of the Eixample.

The geo-spatial information of the buildings (in ArcView, GeoMedia, MapInfo) to facilitate a space reading of the data and to corroborate aspects of assignment to sections and theoretical prices is worked in a GIS with different formats (Shape, Access, Tab).

The need to verify a correct assignment of sections and theoretical values that has been seen modified internally by SGMI is intended. That implies that the works to generate a model of values carried out during September are incongruous with the updated base therefore they have been rejected.

From the image of stretches (inform SGMI) and the new listing of modified sections, the sections of the set of Barcelona are digitalized and the assignment of the same ones to the studied buildings is revised.
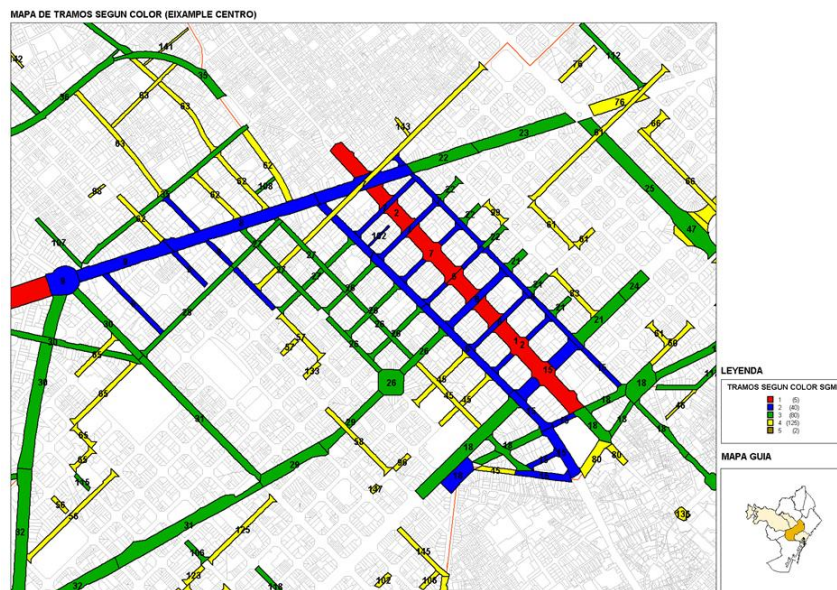

Figure 11: Definition of modified sections, on which new data to every building of the sample are assigned.

Finally a geo-spatial base of theoretical values is created for the delimitation of the revised theoretical prices. It consists in contrasting the prices in market with a certain positional logic and of constructive quality. From about 65 samples of market a base of information of theoretical data is elaborated assigning prices and level of reliability to initiate the process of emulation of the market.

5. FINAL COMMENTS

Maybe, the most relevant aspect of this project has been the elaboration of the GIS application for the purpose of detecting the mismatching in the definitions of the buildings, similar values of final note and theoretical price, studied, thus as the application of the analyses of proximity that allow to detect, for similar characteristics for afterwards from that to reformulate the models of location.

Likewise, when carrying out by analysis of relationship among the sections an important information is obtained in the sense of detecting the possible existing mismatching in the field collection.