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MODERN BUSINESS MANAGEMENT PRINCIPLES APPLIED TO
ROAD NETWORK MANAGEMENT.

SUMMARY:

Business management, in its various aspects, has progressed enormously over the last forty years. Very little of this progress in management has been applied in Public Administration and specifically in road network management.

The report will deal with applying those management principles, taught in the world's main Business Schools, to road network management, mainly as regards commercial, accounting, financial, production and personnel management.

The report will provide explanations of specific cases, which have been applied in the road network of the Community of Madrid.

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1. - INTRODUCTION

For approximately four decades the organizational management techniques have developed spectacularly, with the appearance of action criteria that have revolutionized traditional operations in management bodies. These techniques originated in the USA, in the Business Management Schools of the major Universities, giving rise to a whole series of lessons which their students later applied in their professional practice, in the different companies they worked in.

The first operational aspect of the organizations that these universities confronted was the economic-financial area, giving rise to a management system which spread all over the world around 1980, where the key to a manager's success lay in their ability to interpret balance sheets or analyze cash flow. But already, specialists began to point out that although this aspect was necessary, it was equally necessary to adjust and rationalize commercial, production and personnel management, with the result that by the end of century, modern organizational management comprises attention to a whole series of very varied disciplines, requiring managers of considerably broader scope.

This type of generalized management, although it targeted financial results in the scope of private companies, had intrinsic qualities of rationalization, logic and effectiveness that made it applicable to other types of organizations, such as public organizations.

2. - COMMERCIAL MANAGEMENT IN A ROAD NETWORK

In the case of a public management centre, such as a road network management, it should therefore not seem out of place to use ideas which, coming from other fields of economic activity, can make it more effective. However, before analyzing road network management, we should outline what is the objective of such management, since there is initially no economic result to maximize. Here, there are two trends, one that defines this management as management of the public assets that the highway network infrastructures represent, or one that considers this management as a public service to citizens.

Although it may seem that both trends would produce similar results, an analysis of the issue indicates that this is basically not so: managing an asset is mainly a question of technical characteristics (conservation, extension, repainting, etc...), while managing a service inevitably involves asking users what service they actually want the Administration to give them. This question is associated with a very widespread initial idea in all modern management, which is considering the client as the focus of all decisions taken in the scope of an organization. In the case of a road network, it would be user instead of client, as the network is free, but the principle remains equally effective.

On a world-wide level, different actions have already been carried out aimed at finding out users' expectations on the service that should be provided and their opinion on the service given. In the Region of Madrid's case, the first survey of regional highway users has been carried out in the last months, in order to ascertain clearly if users' perception is in accordance with that of the technicians managing the network. This action is the subject of another report (1) presented in this XXIInd Road World Congress, and we hope its results are sufficiently significant to be able to come to interesting conclusions for the Region of Madrid road network. It is therefore a clear decision to bring users into road investment and infrastructure decisions in coming years, in line

with the general trend of modern private management to give priority to customer attention over all other considerations.

It is interesting to note that if road network management aims to be asset management, this process, following modern management techniques, should imply previous planning by stages, with clear objectives set for the short, medium and long term. In general, the Administrations already automatically adopt this technique when drawing up Regional Development Plans (long term), Road Plans (medium term) and annual investment budgets (short term), although the objectives of such planning may not be presented as clearly as the considerable expense that they generally involve would imply. Resort to clients/users clarifies that process considerably.

3. - PRODUCTION MANAGEMENT IN A ROAD NETWORK

Production management in many companies is currently as professional and technical as possible, with major automation of production processes, often including immediate decision-taking by the automation itself, without any human intervention (a large number of agricultural machines, for example, already carry out this process). Production management in a road network could in some way resemble the technical decision-taking process on actions and infrastructures outlined after specific previous planning. On the basis that this planning is correct, "production" in road network management must therefore be managed according to objective, though not totally automatic, criteria, and according to the latest techniques in construction and restoration of existing highways.

Modern network management, cannot, for example, simply decide upon specific conservation actions on the basis of subjective visual observation criteria. It is true that the technician responsible for a certain network area must physically visit the terrain to complete the manager's decision with his personal criterion; however, strictly technical considerations, obtained after monitoring the net to be conserved, should be of equal importance. This monitoring should be constant and systematic, and implementation periods should be preset, if possible by one single information source, in general, one single monitor.

The General Directorate for Roads in the Region of Madrid, has set up a continuous monitoring plan under a four-year contract with one single consultant, as a fundamental element in its Road Base Management system, the subject of several reports (2, 3), presented both in Spain and abroad.

A maintenance and repair process for structures is also under way, standardizing actions upon them, classified by gravity. It is clear that systematizing like this first requires an inventory procedure, which should be up-dated while different repairs are carried out on each structure.

These are only two aspects of the general management concept through systematizing and rationalizing actions upon a road network. One could add the systematizing of actions, in order to increase Road Safety, by identifying Black Spots, and more recently, Accident-Intense Stretches ("TCA"), providing a broader statistical view. Again, systematizing the acquisition of accident data through a regulated process will lead to knowledge of action priorities, both at specific points on the network, and on whole sections of a specific road, based on strictly objective criteria, and whose response from public opinion will in no way be significant.

4.- FINANCIAL MANAGEMENT IN A ROAD NETWORK

This is a very current issue within the context of Spanish public opinion. The lack of budgetary means, which we all start to perceive as chronic, to finance the construction and maintenance of our road networks, has in the last five years led to a whole series of financial methods, extra-budgetary in a pure sense or differing from the classic budgetary payment, which have been the focus of numerous operations, already in service or at an advanced stage of implementation. The Public Administration's classic recourse over these years has been to debt, and will probably continue in the same way in the future, highly restricted by macro-economic factors. Roads have been made or are being made by means of placing public independent companies in debt (Tres Cantos, Arpegio, Gisa, etc...), by the so-called "German Method", by the Shadow Toll system, resorting to subordinate credits, actual toll concessions, etc...

Besides from the financial engineering aspect of all these systems, there exists a clear aim to dissociate road network investments from the pure budgetary mechanism, often influenced by

other considerations than real functional requirements, and of course with little to do with users' expectations. Road managers are habitually confronted with the fact that requirements are much greater than the amounts budgeted. It might be said that this is the case of all economic activity; nevertheless, in the case of roads, there exists the feeling, corroborated by several extensive studies, that what benefits roads provide to a nation's economy is much greater in terms of income than the expenses later invested to maintain these same networks.

Modern management principles recommend dividing an organization into independent units with individualized operating accounts (and therefore income); the autonomous management that this creates gives rise to improved economic results, since managers have greater responsibility for their performance, and are closer to the field than if their action cannot be separated (and therefore praised or punished) from those of the rest of the organization's managers. In consequence, the trend is to separate between income and expenses at the level of each production unit.

In the area of public management, it is worth pointing out that the European Commission itself (4) has mentioned in the White Paper on Fees for the Use of Infrastructures, that member states must tend gradually towards a strategy that implements the principle of "the user pays", in such a way that specific income is created for roads. This is a document to which it does not seem logical to add political connotations, since it was laid down by a supra-national organization. The European Region does not refer to the specific issue of tolls, but to the overall need for highway infrastructure users, of any highway infrastructure, to participate in its payment and maintenance.

A few years ago, the General Directorate for Roads of the Ministry of Public Works tried to set up a mechanism through which this management centre would act as a Road Agency, with an organizational structure different from those of the rest of the Ministry of Public Works' management centres, and with a budget that included a series of specific incomes. At that time, the principle of centralized cash management ("caja única") in the legislation prevailed over all other types of consideration and the proposal was dropped.

It is worth recalling here that in the World Bank's Technical Document on Commercial Supervision and Road Financing (5), again a supra-national organization such as the World Bank, recommended, through the principle of "user pays", the creation of Road Agencies or Funds; the document also includes a series of countries where this measure has been implemented to a greater or lesser degree. It is worth mentioning here that the number of countries that have implemented these principles, or are in the process of implementing them, range from the developed (USA, Japan, New Zealand) to developing countries (Ghana, Letonia, Malawi, Jordan, etc...); consequently, this is not just an experiment by some isolated Administration but a widespread trend, and which is also supported by institutions on a supra-national level as significant as the World Bank and the European Commission.

In the different administrations where this process is being implemented, the origin of the funds for financing these Road Agencies vary greatly and range from the creation of specific new taxes on fuel, or tariffs on transport associated with road use, to assigning extra-budgetary state funds, or direct participation in funding by the road users themselves (such as in the case of Finland). It is interesting that in many cases, especially where economic contribution from users is required, whether directly or through new taxes, every Administrations' organization includes a means by which users themselves can take part in these Road Agencies' decision procedures. This seems to be, in the view of the World Bank, the decisive factor for these new kinds of funds to be implemented in the civil society.

As regards the Region of Madrid, trial experiments are starting to be conducted on this matter. In one of them, a meeting was held with a group of industrialists exploiting new quarries in the East of the Regional Region, and who, together with the affected local councils and the General Directorate for roads itself, have formed a discussion group for the maintenance and improvement of regional roads which are being used primarily for transporting dry goods from these quarries. Economic participation from the transporters lies mainly in free supply of the road materials necessary for the works.

The second experiment consists of forming a tripartite group, Users-City Council-General Directorate for Roads, for the restoration of the access section to a major housing estate in the east of the Region of Madrid, where participation by the three parties would initially be

exclusively monetary, with the General Directorate for Roads providing the technical know-how and managing the operation.

Here we have two experiments at a development stage (the first of which may attract other quarry operators from other areas in the Region of Madrid), which will be monitored with great interest to see if they may form the embryo for a future Road Agency or Fund at a greater than sub-regional scope.

The financial independence that many road administrations demand, may also be obtained by monetarizing the assets they manage. Although radical actions have been under way in this respect, such as the case of Transit New Zealand, the State Agency for roads in New Zealand, there exists a kind of softer financing which has been the subject of another article by the writer in a recent edition of the Public works Journal devoted to Financing Public Works (6).

This is the so-called “Lease-Back”, a financial mechanism widely used by private initiatives for decades, and which basically consists of selling an asset to a finance organization, while simultaneously taking a lease on this same asset from the same finance organization. The liquid funds thus freed are used for new actions upon the network. This system is not yet used in Spain, although it has been in Austria, and would not require any particular modification of the legislation in force, as has been extensively set out by noteworthy administration analysts, such as professors Gaspar Ariño (7) and Francisco Jimenez de Cisneros (8). Lease-Back, considering the scope of the asset represented by a road network, would probably solve this network’s financing problems for many decades. It is to be hoped that the spanish administration’s political and financial objectives come together so that this financing procedure may be put into practice in the not-too-distant future.

5.- ACCOUNTING IN A ROAD NETWORK

In any private organization, accounting must ensure that the figures resulting from its action reflect the financial situation of the organization; a second aspect that accountancy must ensure is that the organization’s day-to-day progress is also reflected exactly.

Modern accounting principles are based on certain criteria adopted historically through practice, and subsequently by the accounting legislation; however, we should not forget that these principles originated from a wide consensus on different standards. This is why Accounting, contrary to what it may seem, is not an exact science. This last consideration, which is the reality in practice, frequently clashes head-on with a Public Administration's need for total transparency in its accounts, reflecting how it handles public funds.

This is probably why public accounts management has not yet explored the ins and outs of drawing up balance sheets, although it does prepare some kind of operating account, as in budgetary control. It seems unquestionable that it is important to know the value of the asset managed, that is, the accounting value of the road network. Nevertheless, this problem has not been dealt with by any Spanish administration, probably due to the lack of definition and necessary standards that its implementation would require. However, it is necessary to know this asset value even if it is merely a question of defining logical amounts for its conservation, in terms of percentage.

As regards how this asset is managed from day to day, the General Budget Act (RDL 1091/1998) and the various Regulating Acts by the Treasury for the Autonomous Regions, have set up a strictly budgetary control system. There is no management control, although Additional Legislation for the General State Budget some years ago timidly included in some of its articles the need to control the management of some public works (especially roads).

Budgetary control is a system that has been abandoned for decades by private companies, which mostly use management control, so it is surprising that public activity continues to use it as its only accounting objective. It is also surprising because public opinion is not interested, except in isolated cases, if more or less than a specific budgeted amount has been spent, but rather, above all, whether that amount has been well spent; that is, for example, if the cost per kilometer of reinforcing a certain two-lane road lies within the normal parameters or not and for what reasons. None of this is to be found in current legislation nor in present-day practice. What is more, in the various parliamentary controls for public managers, rarely is any mention made of anything other than the proportion of the budget that has effectively been spent. This is an incentive to expenditure for the sake of expenditure, which fortunately does not produce

perverse effects due to the responsibility of a very large number of public managers, although the present-day control system does nothing to support them. The lower cost of a certain public project is not valued publicly, and rarely politically. In day-to-day management, there are countless opportunities to reduce these costs, as the writer has already mentioned in an article some years ago (9). Furthermore, it is a clear measure of management's success to attain a lower cost for the same quality.

Worth mentioning is the growing complication created by the current budgetary management. Whilst it must necessarily be based on legal texts, it requires a great deal of accounting documentation to be prepared; this could be avoided by substituting budgetary control with management control.

This type of control would not be difficult to implement in public administration, since it simply requires some objectives to be set, (not just budgetary objectives) and mechanisms to be set up to verify if these objectives have been met over the accounting period. There are many kinds of objectives and many simple types of control for obtaining them. It is to be hoped that in the future, political evolution towards modernizing management of the Spanish Public Administration leads to an evolution in the laws involved, as to achieve a more rational accounts management and management control, which public opinion is demanding with more and more insistence.

6.- PERSONNEL MANAGEMENT IN A ROAD NETWORK.

Traditionally, personnel management had only been considered from an administrative point of view, that is, salary procedures, Social Security documentation, holiday administration, etc... This point of view was broadly overtaken about twenty years ago to include concepts such as motivation, workers' professional development, training, etc., forming the vast concept of personnel management. The origin of this development was basically the consideration that nothing can be done without people, and that workers are the first and foremost asset of any organization. A large number of essays, usually from the US, have defined different concepts in this respect; it is worth mentioning here one which had a large impact in the 80s and which is presented as reference (10).

So far, Public Administration has not gone beyond the administrative aspect of personnel management, (except for a few timid attempts). Although Act 30/84, on Measures Amending the Civil Service dealt with the reorganization of personnel, it discussed such issues from a strictly administrative point of view and did not consider issues such as maintaining motivation, the management of change, etc.

The administration itself has always been blamed for this legislative rigidity. Public managers have no access to salaries of their own personnel, nor to the possibility of giving incentives or penalties (beyond administrative sanctions which have been used very rarely, and with little success). However, it does not seem that this is a fundamental reason barring the possibility of acting upon personnel management.

The practice of working with people suggests that very occasionally, and only in the lower levels of the organization, motivation is based upon reasons of monetary compensation. A salary increase, even a considerable one, has no effect upon motivation beyond the short term. After just a few months, if the worker's basic motivation fails, he comes around thinking that the increase was well-deserved, and hadn't actually been enough.

A worker's true motivation is always his own work. The work must be interesting for him, it must meet his expectations, it must make him feel that all his capacities are being used, and he must feel recognized for it; a recognition that does not necessarily mean a reward, but above all that he is taken into account.

In the Region of Madrid, we have seen two clear examples of the above. One of these was the work carried out by civil servants under the General Directorate for Roads in clearing snow from passes in the Sierra Norte, compared with the work of two private contractors in charge of clearing snow from other passes in the Autonomous Region. While personnel in the second of these had a very high turnover, often lacked appropriate training in handling the machinery, and were problematic in accepting extra-contractual work, the civil servants under the General Directorate for Roads were always available, even at very inconvenient hours, and acted with much greater personal intensity, as they considered the road as something of their own, as if it

were “their” own road. The motivation involved in working on something they considered their property was enough for their services to be of objectively higher quality (in terms of user satisfaction) than that of personnel who only worked for a salary.

Another example was the works to widen and enhance mountain roads (in one case, a 15-kilometre stretch and in another one of 3 kilometres) carried out exclusively by Road Directorate personnel, supplemented by some external supplies, mainly graded aggregate and asphalt concrete. (Photos 1 y 2).

Foto 1

Foto 2

The results are obvious, including the widening of some small structures. Motivation for their work, general recognition for a job well done and team work feeling with a shared objective, easily made up for the supposed lack of previous organization for this kind of work. Organization came about almost spontaneously through the motivation itself. The implementation periods were about a third of what the normal administrative procedure would have taken, project included, in works carried out by ordinary external contracting.

As a result, the Region of Madrid is maintaining its own personnel for carrying out some programmed actions, due to the flexibility that this adds and to the obvious increase in personal

satisfaction that carrying out such works and actions gives to the workers of the General Directorate for Roads, and in their morale.

All this issues raised here depend exclusively upon the managers themselves and their leadership style. Without entering fully into leadership techniques, managers must be clear and honest with workers, and must inform them almost immediately of the opinion their work deserves (11). These qualities and ways of acting are completely independent from the budget and are based only on the training and personal qualities of the managers themselves. Very often, civil servants, knowing that their boss has no way of improving their salary, will feel grateful and motivated by praise who departs from pure protocol and enters decisively into the personal terrain. The boss' skill, sincerity and professionalism will be the guarantee of the praise's results.

From the point of view of strict incentivitation by periodic salary increases with bonuses for success in performance, some experiments have been conducted at the central government level, apparently without the desired results. It seems there was insufficient explanation to the workers why they were given a bonus, so that those who received it - and those who did not - could understand the whole process, and ensure there was no favouritism involved.

More over, Barcelona City Council has recently set up a system of productivity bonuses whose progress will have to be closely monitored. Nevertheless, leaving aside considerations that fall outside the actions of technical-type public managers, as are those who manage road networks, it seems expedient to conclude that to improve personnel management, public managers should transmit to their subordinates the qualities of availability, hard work, integrity and honesty, which have been used successfully for a long time by any private manager to enhance worker motivation.

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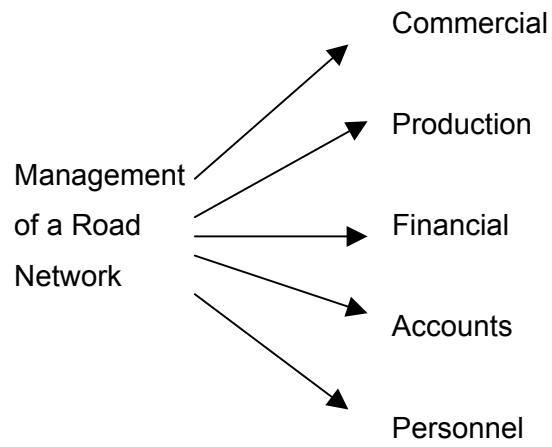
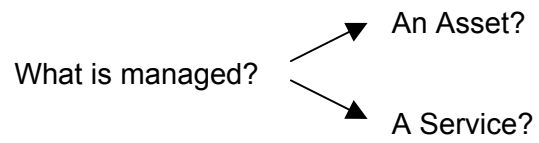
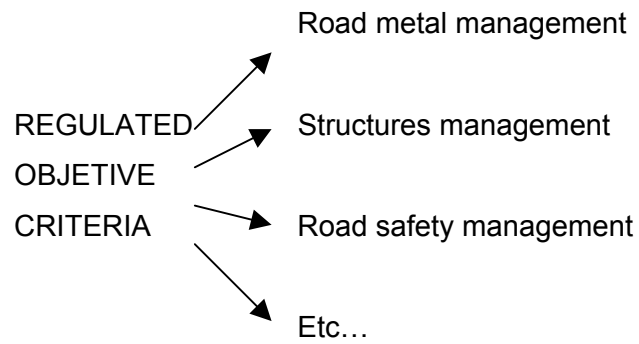


Diagram 1



COMERCIAL MANAGEMENT

Diagram 2



PRODUCTION MANAGEMENT

Diagram 3

- Extra-budgetary financing
- Long-term financing
- Road Agencies or Funds
- Lease-Back

FINANCIAL MANAGEMENT

Diagram 4

- Budgetary control —————▶ Current
- Management control —————▶ Future?

ACCOUNTS MANAGEMENT

Diagram 5

- Personnel administration —————▶ outside activity technical manager
- Personnel —————▶ Workers are organization's main asset

PERSONNEL MANAGEMENT

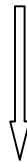
Diagram 6

ROAD NETWORK
MANAGEMENT

- ▶ Commercial management
- ▶ Production management
- ▶ Financial management
- ▶ Accounts management
- ▶ Personnel management

COMERCIAL MANAGEMENT

- Asset management
- Service management



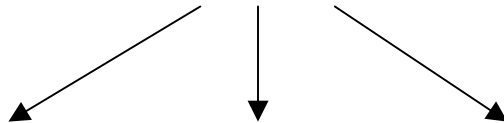
Clients/users focus of
all decisions

PRODUCTION MANAGEMENT

Road production = technical process that creates them



REGULATED OBJECTIVE CRITERIA



ACM ⇒ Road Metal Management Structures Management Road Safety Management

FINANCIAL MANAGEMENT

Generalized objective —————▶ Separate investments from annual budget

- ROAD AGENCIES OR FUNDS

- Assumed by:
 - European Commission
 - World Bank
 - Developed countries: USA
Japan
New Zealand
...
 - Developing countries: Ghana
Letonia
Malawi
Jordan
...

- Experiments in progress in the ACM

- MONETARIZATION OF THE ASSET:

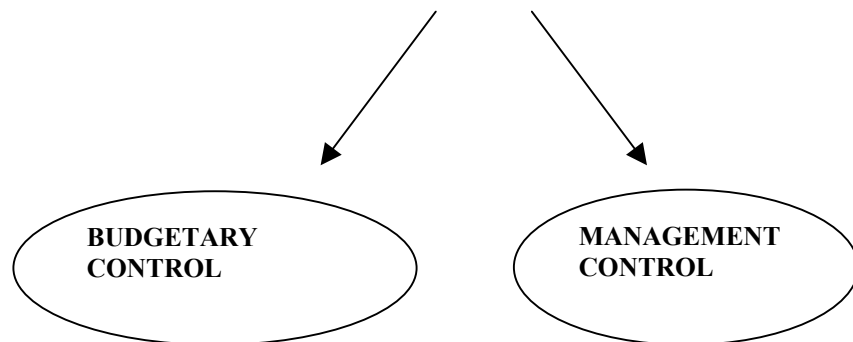
- Lease-Back

ACCOUNTS MANAGEMENT

* Balance: Value of the asset?

* "Operating account" \Rightarrow Day-to-day asset management?

**WITHOUT ASSET EVALUATION OR INCOME OBJECTIVE
THERE CAN ONLY BE COST CONTROL**



PERSONNEL MANAGEMENT

- Personnel administration management
- Personnel management:
 - professional development
 - training
 - contracting
 - motivation

