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ABSTRACT:

The principal aim of this paper is to develop a simple and objective model which can classify and systematise telework, and provide a standard for Portugal.

This model defines special concepts of telework and allows the division of the activity in this area, making its application easier.

The model was constructed on the basis of four perspectives which it has to cover: the economic and social, of the employers, of the teleworkers and the suppliers of goods and services.

The presentation of the model according to the employers perspective is complemented with its own application project at the firm Via Consultores, classifying its active personnel by the ABC Model. This classification is the telework implementation standard adjusted to the firm's strategy by means of: selection and management of the teleworkers activities, recruitment, training, availability of equipment, estimation of costs and incomes, etc.

In order to cover the suppliers of goods and services perspective, we must classify the teleworkers. To facilitate this task, I propose a methodology based on the Use Of Time Survey, a project being developed by the National Statistics Institute of Portugal, which allows us to classify different teleworkers standards of living in the different categories of the ABC Model and compare them with those of common workers. This will give, on one hand, the chance of finding business opportunities, and at the same time it will help organisations to plan and manage their telework.

KEYWORDS: telework, model, categorisation, management, organisation

" The Industrial Revolution of the 18th century diminished the importance of sheer physical strength in economic productivity. The Information Revolution of the late 20th century has reduced the economic importance of time and space."

James Fallows, 1994 [1]

1. INTRODUCTION

One of the most characteristic demonstrations of how the Information Society functions, are the new work forms allowing TELEWORK.

Writing in the computer publication LAN magazine, Rob Page said that "(...)it is certainly no secret that our society is moving away from a manufacturing and industrial focus and becoming an information-driven machine (...) the nascent markets of the 90's are based on value-added services which are typically the result of adept information management." [2]

It is important to explore this revolution in working form, taking advantage of the opportunities that it offers to employees, employers, overpopulated cities, inland regions, Portugal as a frontier country and to European cohesion itself.

The number of people in Portugal with jobs connected with information is getting bigger and bigger, this field of occupation is one of the most "qualified" to a telework system. On the other hand, it will allow the conception of new and different jobs and of high added value. Its integration into the organisational structures of national firms will need appropriate management, calling for a real strategic management of telework.

This text is divided into two parts, defined by their goals.

The first presents the so-called ABC Model for Telework in Portugal. First, we must discuss its basic perspectives and present it. The presentation of the model in accordance with the organisational framework is complemented by its own application project in the firm Via Consultores.

It appears as a complement to the second part, namely to the segmentation perspective of the teleworkers market, presenting a methodology based the Use Of Time Survey of the National Statistics Institute of Portugal which allows the execution of a study on teleworkers standard of living, classifying them according to the ABC Model and comparing them with conventional workers.

2. THE ABC MODEL FOR TELEWORK

To discuss the subject of telework in order to take advantage of its opportunities it is first necessary to delineate, a model that classifies it in a simple and objective way.

It is important that this model fulfils four perspectives, in a very clear way:

1 - The economic perspective: How to classify telework in order to understand and to plan its economic and social impact and to develop the appropriate strategies.

2 - The employer's perspective: How to classify teleworkers in order to determine their management, recruitment, policies, etc.

3 - The teleworker's perspective: How to classify people who see themselves as teleworkers.

4 - The supplier of goods and services perspective: How to divide the market in order to support the future development of goods, marketing and sales, distribution channels, promotions, etc.

So, we have three basic categories:

Category A: Those who telework enough to call themselves teleworkers, in though seldom of doing it in such a way that the telework can be considered as a normal task in their work.

Category B: Those for whom their telework is enough, for it to have become a normal task in their routine work. Their work place is still the traditional one.

Category C: Those for whom telework has become their main way of working. They continue to go occasionally to their traditional work places, but their real working place is their "virtual office".

These types must be quantified in order to clarify this division:

Cat. A: Works in a telework system, usually less than one day a week.

Cat. B: Works in a telework system, usually once or twice a week.

Cat. C: Works in a telework system, usually more than twice a week.

Considering these basic categories, it is necessary to place them in a context that correctly shows the regional differences existing in Portugal. Each of the mentioned categories is subdivided into Urban and Rural, allowing the model to consider them.

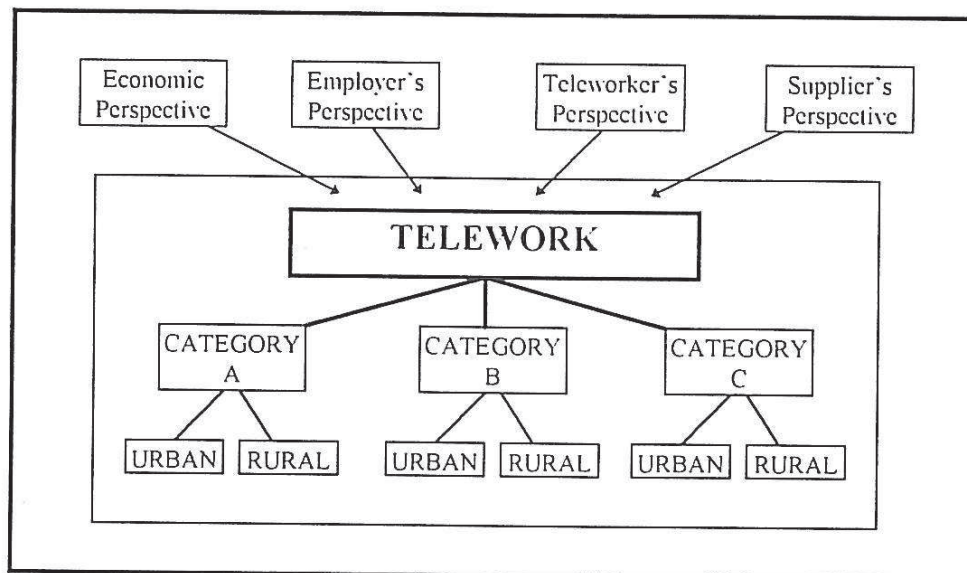
URBAN: Telework is executed in an urban area (for instance Greater Lisbon and Greater Oporto).

RURAL: Telework is executed in a rural area (for instance inland)

The definition of these concepts, suggesting a selective typology, allows the development of selective policies and efficient information collection, making the statistical treatment of the final results easier.

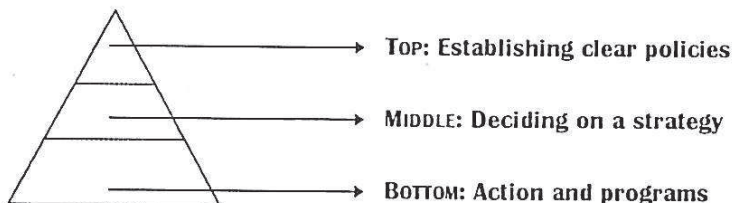
We are now going to analyse the performance model in detail (Figure A).

Figure A: The ABC Model



3. Employer's Perspective - Organisational Framework

As any other management function[3] telework can be assigned three levels:



VIA CONSULTORES is a consulting and business development firm, with its headquarters in Lisbon and a branch in Oporto.

Giving its clients all over the country a services "package" going from analysis and financial recovery, through the market research, promotion of sales points to marketing campaigns and the development of goods and services, etc.

Due to the multiplicity of services offered, VIA relies on a team of consultants and technicians with training in several areas, some of them working with "partners".

As in most firms, there are always questions about the feasibility of a new program or new technology in their organisation. The reason for their adoption is usually based on technological tendencies and on the need to remain competitive, or even to get a comparative advantage over the competition.

The adoption of a strategy that includes telework, supported by ABC Model, needs a systematical analysis to identify who and in what circumstances it is better adjusted to fulfil telework.

3.1 ESTABLISHING CLEAR POLICIES

It is important that the firm has a set of clear policies about telework, the commitment of top managers is essential. The establishment of a plan for telework is not very difficult, requiring only a little attention and time from the organisation's executive level.

For the establishment of that plan, we underline the following points:

Clarify to what extent and where it is intended to have expenses. Determine if the organisation should, for instance, contribute to household expenses when the teleworker is at home, working on the organisation's order. If it is intended to avoid extra expenses, a good solution is telework voluntary. However, the organisation must always pay the phone bills. It is a good idea for the teleworker to have an extra phone line at home for this purpose, whose expenses will be covered by the firm.

Check if the work contract terms allow the execution of tasks in a telework system. Portuguese law is not very clear, leading to some questions and limitations with regard to the social security system and work insurances in these cases.

It is also very important to establish rules about "who can or should telework" and "the circumstances in which that work is carried out". The most reasonable solution is for middle management to take these decision. However, it will be necessary to establish general guide lines.

Define clearly if the organisation's policy is to promote telework whenever it makes sense, or if, on the contrary, to be highly selective considering telework as an exception.

VIA intends to improve the number of clients in an harmonised and efficient way, which means it has consider the following factors:

- Improving effectiveness in terms of cooperation with Oporto branch.
- Using more often R&D services provided by an assistant teacher at the University of Algarve, living in that area of the country.
- Maximizing the profitability of the consultants and technicians who work in the "partners" system, taking into account that some of them are in VIA as second job and it is situated outside Lisbon.
- Maximizing the profitability of the consultants and technicians who work exclusively for VIA and live outside Lisbon, namely on South Bark, which means a journey of about an hour per trip (according to INE data, Census 91).
- The firm's strategy, favours expansion towards Central Portugal, where it intends to seting a business centre.
- A possible personnel increase is conditioned by the available space in its headquarters.
- As VIA is a firm that works mainly with information it is assumed that having telework in its strategical plan may contribute effectively to achievement of the critical factors for success.

The obstacles that might condicione telework success are as follows:

1 - The present models of the firm's organisation, with top managears in constant and personal attendance on projects.

As the teleworker needs a certain "autonomy" it is necessary that project development be done with some attention from leading managers, with the frequency changing according to the teleworker category A, B or C (Urban or Rural).

2 - Present computer facilities are not the best, since there is not a good enough network of data communication in the firm. On the other hand, we do not know if the PC equipment can guarantee good on-line work.

The solution may be the establishment of an INTRANET, given the advantages offered by this system over traditional networks in terms of costs. As for information and personal telecommunications equipment, the characterisation of needs will be connected with the categorisation of each teleworker according to the ABC Model.

3 - The personel's lack of availability or even of the capacity to sekf-manage their own work in a telework system.

Since it may harm the profitability of work done, it is not recommended, to put in a telework system people who show these signs. The solution is to define a policy for contracting personnel, for the future, considering if the job to be done includes telework or not. Specific training may also be given. All these actions may be taken include teleworkers in any of the ABC Model categories.

The applicants for telework will be most of all VIA personnel, consultants, technicians and secretaries.

3.2 DECIDING ON A STRATEGY

The simplest form of strategy is "deliberate delay": "Our strategy is to not consider any formal activities regarding telework until date X" [4]

This is better than no strategy at all, but when you decide to develop a more coherent strategy, start from your key business goals and issues. A telework programme that saves money is not necessarily a good thing when the key competitive issues in your market happen to be about customer service and "getting closer to customers". A telework programme will be inefficient if the main strategy of the organisation is to outsource as many jobs as possible.

The strategy will make clear:

- Why you are adopting telework;
- What results are to be achieved over what time scale;
- A scenario of how you expect the enterprise to operate when your telework strategy has matured.

Is an important consideration that the best teleworkers are strong performers on the job and are self-disciplined, highly motivated, and comfortable working alone. Those who need constant direction make poor teleworkers.

Because most workplaces operate under an outmoded industrial/manufacturing model which relies on middle management "keeping an eye" on employees, this discourages innovation and individual, creative work styles, and might affect telework success.

The implementation of the telework must be done on the categorization of the personnel by the ABC Model.

The strategy is defined by the results achieved over time:

Short Term: Immediate categorization of the employees

- * Secretaries: Category A/Urban;
- * Consultant and technician partners: Category C/Urban and Category C/Rural;
- * Full time consultants and technicians: Category B/Urban and Category B/Rural;
- * Researchers: Category C/Rural.

Long Term:

- * Creation of a telecenter/telecottage in the Centre of the country, taking advantage of the acquired experience in teleworking.
 - * Creation of a telecenter on the South Bank of Lisbon.
-

3.3 ACTION AND PROGRAMS

The action and effective program implementation, must be based on the planned strategic result of each organisation. So it is very hard to specify any general orientation. However, there are some important common matters:

3.3.1 Management:

Is vital that all managers understand the policies adopted, the purposes of the strategy and the results hoped for with the plan.

Performance Management and Evaluation

A major concern will be the supervising and performance evaluation of off-site employees. When it comes to evaluating off-site employees work, the two primary criteria should be the quality of work and completion of projects. This involves managing by objectives and results and rather by monitoring.

Measuring Job Performance

A successful performance evaluation process requires that supervisors and employees jointly set clear performance objectives, including:

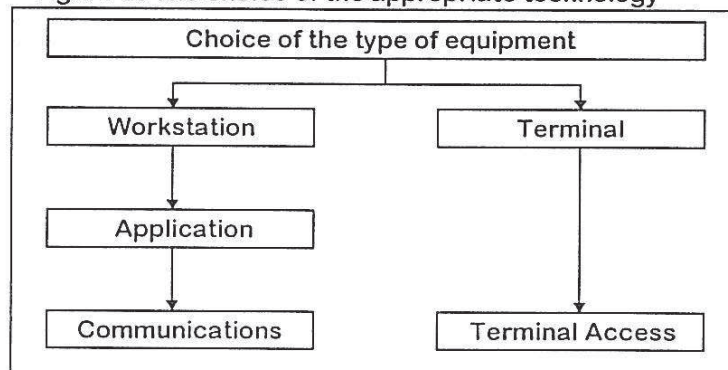
- * Establishing how to measure the objectives.
- * Identifying tasks and behavior objectives to be accomplished.
- * Prioritizing work with the most crucial results.
- * Having supervisors define tasks as far as possible in terms of output.

3.3.2 Technology

In an organisation with an efficient OEN, telework will appear almost naturally. On the other hand, if the organisation still does not yet work with a system like OEN, telework will show the fragility of organisational communications.

The teleworkers must have access to the computing resources needed for their jobs. Today's technology provides a wide range of solutions that can help, but you need to choose the most appropriate. There are some basic steps that one must follow:

Figure B: The choice of the appropriate technology



As a first step, you should choose the type of equipment necessary for the telework and then decide between a workstation or a terminal and communications link.

If you decide on a workstation, you must determine what application software to use; after that, the choice of the communications link depends on what kind of information you work with. The access and the volume of the data you need to transfer will determine how fast a link you need, while your distance from the office and the hours you will be using the link will determine the most cost-effective technology.

If all interactions with corporate computing resources use a terminal to access applications running on a central computer, then you will need a terminal and a modem as communications link.

For both options, we are going to present two different diagrams, for two different needs.

Figure C: Basic Telework

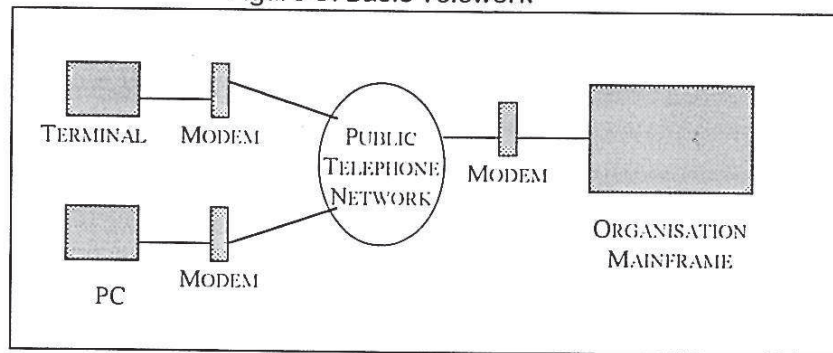
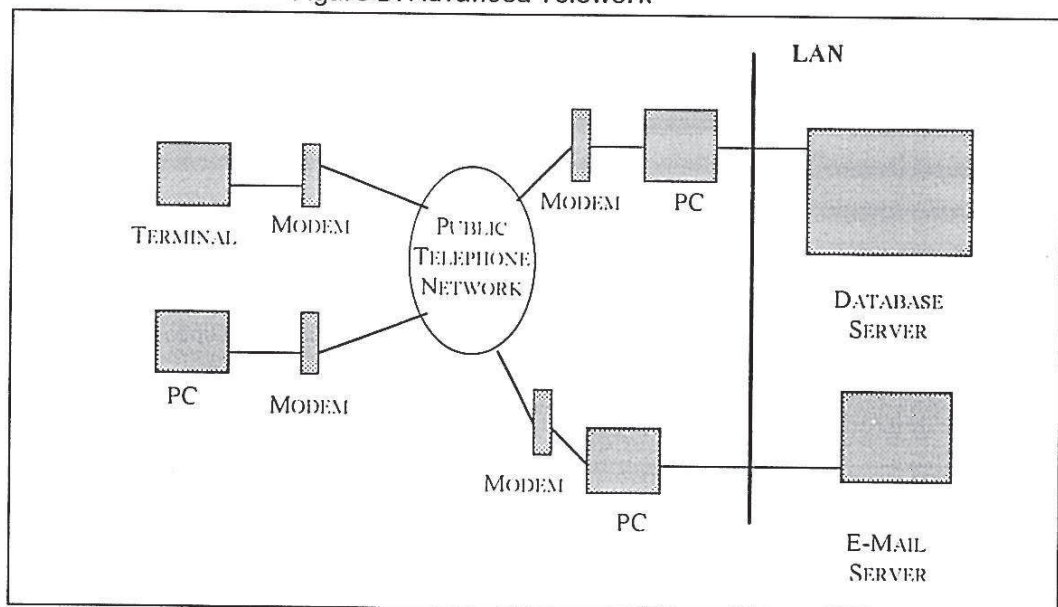


Figure D: Advanced Telework



3.3.2 The ABC Model

The ABC Model can be used to build a support system for the decision-making process, allowing sensible employees differentiation to develop a corresponding strategy.

As a resumé, and taking into consideration the Urban/Rural distinction, it is important to decide the days on which and the frequency with which telework will take place, and to define personal contacts with clients or project groups:

Category A: Develop and apply a general organisation strategy, that will permit you to decide on the circumstances in which the telework occurs.

Category B: Decide on the principal points to be used, by managers, to determine when and who can be a teleworker in this category. This is of extreme importance on account of considerations like as the labour contract, the assignment of a working place to an employee, the application of social security legislation, the insurances, etc.

Category C: If the organisation intends to maintain a substantial number of teleworkers in this category, new organisation and planning systems are absolutely necessary.

The decision about who belongs to category B or C should not be made by random processes. Is important to have clear and objective definitions about what makes sense in the organisational context.

Taking into consideration the categorization decision, previously made, it will be possible to increase the number of collaborators, controlling the expenses associated with that increase, as well as making the organisation structure flexible, and maintaining the head-office as the nerve center of the whole organisation.

Following all the plans already mentioned, telework integration, must be complemented with:

1. The implementation of an adequate information system (based on the diagram on Fig.C).

2. The knowledge of what kind of equipment the workers have, with the minimum characteristics to perform telework being established. These characteristics are based on the categorization of the teleworkers with the ABC Model.

In the case of teleworkers without equipment with those characteristics, the organisation will create incentives for them to acquire it. If they already have it, the organisation will compensate them in some way, for the use of their equipment. In some cases VIA can even buy the equipment.

3. Compensation for the use of personal telephone lines:

Category A: Monthly payment.

Category B: Monthly payment or a percentage of the telephone expenses (in both cases with recourse to the detailed facturation bill).

Category C: Installation of an exclusive phone-line.

4. Provision of training for the teleworker candidates and, the installation of a proper training system. That must be done by the time the new workers arrive and the training courses must be oriented towards the teleworker categories.

5. Execution of a financial analysis in order to calculate the costs and benefits expected with the implementation of the teleworker strategy. Conceptual alternatives to the strategy which consider possible deviations from the chosen strategy should be created.

4. Supplier's Perspective - Market Segmentation

Telework attracts public interest as an emerging phenomenon which ostensibly changes the rules of the game for the gainfully employed. The location and social components of everyday life are potentially altered as a consequence of where one goes and whom one sees in the process. The organisation of daily life in terms of time may also change when workers are liberated from the common constraints of opening and closing hours. Interest in this form of personal, family and societal change is enhanced by the advertising of economic interests which stand to benefit from selling devices which facilitate telework [5].

The ABC Model can be used as a way to segment the market, in order to support differentiated and efficient approximations, according to what is required of the products offered. The model can leverage the effectiveness of product requirements and product marketing, for example:

Category A: Needs little technology on equipment/services, specially acquired to support the activity.

Category B: Works at home with sufficient frequency to need some technology/products/services that they would acquire mainly to support telework.

Category C: Routinely works at home, needs to use all the technology/products/services that contribute to optimising their work.

The analysis of daily activity patterns will provide the chance to identify business opportunities, while at the same time helping organisations or governants to plan and manage telework.

To collect data to carry out this kind of analysis, I propose a methodology based on the USE OF TIME SURVEY, a project being developed by the National Statistics Institute of Portugal. This survey consists of collecting data about daily tasks, every 15 minutes, from a representative sample of the portuguese population.

Viewed from a detailed perspective, daily activities are sequences characterised by order, duration and pattern of transition from one activity to another. Coupled with personal impressions of satisfaction, stress and the degree of choice available which are implicit in the activity, the sequence is a complete description of social living conditions.

This method offers a powerful technique for analysing the full richness of daily data, not discarding the details of episode ordering, duration or transition.

Comparing teleworkers and conventional workers

In the case of telework, it is desirable to analyse the time-use data first at the episode level, as a step towards differentiating the subgroups for comparison. Only once the subgroups are established through analysis at the episode level is it straightforward to aggregate activities, locations and persons present to periodic totals, within the subgroups established [6].

To illustrate this methodology, we have collected a small sample of workers, including intentionally some teleworkers (Table A), regardless that these teleworkers are not representative of Portuguese teleworkers, who are estimated at 65000 to 90000 in the current year [7].

Table A : Constitution of the Sample

Conventional Workers (CW)	20
Teleworkers (TW)	28
Category A / Urban (A/U)	3
Category A / Rural (A/R) ¹	-
Category B / Urban (B/U)	7
Category B / Rural (B/R)	3
Category C / Urban (C/U)	9
Category C / Rural (C/R)	6
TOTAL	48

Yet even with the minimalistic subsamples identified, the subsequent comparisons of teleworkers and conventional workers produced results which were consistent with hypotheses in the literature[8]. For example, the teleworkers were found to spend fewer minutes a day traveling, but slightly more time doing paid work. Consistent with expectations, the teleworkers got much more sleep.

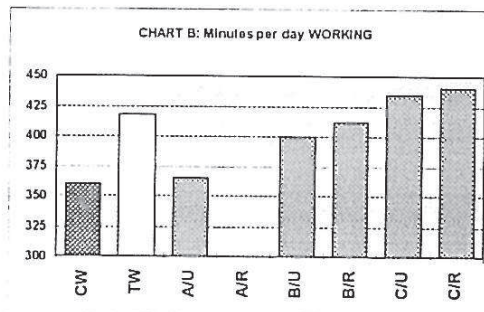
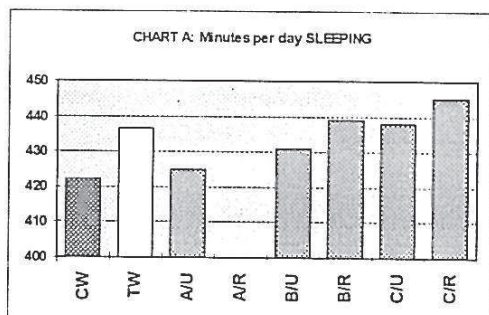
The following tables deal with the comparison of the mean number of minutes devoted to activities during the diary day in one week of study (except weekends).

¹ No data available

A) Comparing General Activities

Table B : Minutes per day in GENERAL ACTIVITIES

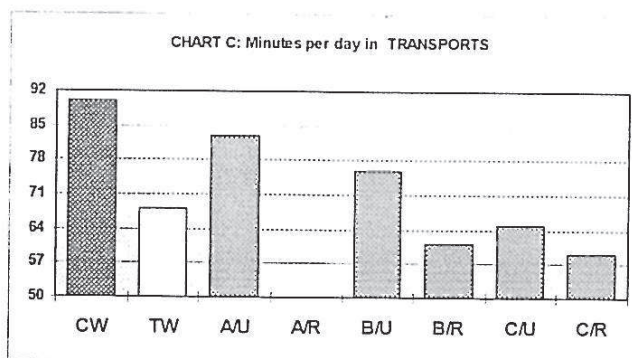
	CW	TW	A/U	A/R	B/U	B/R	C/U	C/R
<i>Cultural Activities</i>	4	3.86	4	-	3	5	4	4
<i>Food Preparation</i>	29	30.93	27	-	29	34	30	35
<i>Sleep</i>	422	436.46	425	-	431	439	438	445
<i>Shopping</i>	13	13.64	12	-	13	12	15	14
<i>Hobbies</i>	12	11.00	10	-	11	14	9	13
<i>Doing paid Work</i>	360	417.57	365	-	400	412	435	441



B) Comparing Transports

Table C : Minutes per day in TRANSPORT

	CW	TW	A/U	A/R	B/U	B/R	C/U	C/R
<i>TOTAL</i>	90	67.96	83	-	76	61	65	59
<i>Automobile/Motorcycle</i>	57	48.57	55	-	52	47	50	40
<i>Public Transport</i>	20	9.21	17	-	15	5	7	4
<i>On foot</i>	13	9.75	11	-	9	9	8	13
<i>Others</i>	0	0.43	0	-	0	0	0	2



CONCLUSIONS

Telework is not a miraculous solution for the problem of unemployment, but the desire to attract and retain skilled employees contributes to solving the problem of being far inland, which affects some regions of Portugal.

Additionally, as organisations seek to reduce employee turnover, thereby reducing the high cost of recruiting and training new employees, they have become more willing to offer their employees more flexible work arrangements.

We are not going to see the day when everyone works at home in blue jeans, but it's clear that the days of everyone going to the office five days a week are rapidly disappearing.

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