

IDENTIFICACIÓN DE FACTORES QUE INFLUYEN EN EL COMPROMISO DE LOS EMPLEADOS UTILIZANDO SYSTEMS THINKING

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IDENTIFICATION OF THE FACTORS WHICH INFLUENCE EMPLOYEE COMMITMENT USING SYSTEMS THINKING

ABSTRACT:

In our increasingly globalised economy, managing continuous change and remaining competitive has become a central issue for organisations in the industrial sector. Building a sustainable competitive advantage through effective decision making and the use of decision making tools has been widely studied [1,2]. The success of a company will be dependent on the skills of the workers, their capacity for learning, and adapting to special and evolving client necessities. Culture change via, communication and participation are the elements of change identified for engineering companies [3]. Thus, the main objective of this research is to understand the behaviour of commitment, the variables that influence it and the variables that are influenced by it. Commitment is considered a key factor due to its influence on performance. The methodology that was followed was based on the modelling methodology proposed by Sterman [4]. The first step was the problem definition, the second step was data collection. The purpose was to define the feedback loops of which the conceptual model (CM) is composed. Thirdly, conceptual model definition was developed. As a result, the outcome that is achieved through this research is a conceptual model. The main function of this model is to facilitate the understanding of the behaviour of commitment through Systems Thinking tools. This research contributes to both Strategic Human Resource Management (SHRM) and Systems Thinking (ST) fields of study. The most notable contribution for ST is the fact of combining more than one input source (Literature + Group Model Building + prior research) for the conceptual model definition. The combination of these input sources for an ST model is not common in the scientific community. Moreover, the use of ST in SHRM is limited.

Keywords: Commitment, Systems Thinking, Group Model Building, Strategic Human Resource Management


RESUMEN:

En el entorno globalizado en el que vivimos, la capacidad de gestionar el cambio y ser competitivo se ha convertido en el foco central de las organizaciones en el sector industrial. La obtención de ventaja competitiva mediante la toma de decisiones efectiva y la utilización de herramientas resulta de interés [1,2]. El éxito de las organizaciones depende de las habilidades de los trabajadores, su capacidad de aprendizaje, y de adaptación a las necesidades de los clientes. El cambio de cultura organizacional, comunicación y participación son los elementos clave identificados para las organizaciones de ingeniería [3]. Así, el objetivo principal de esta investigación es la comprensión del comportamiento de la variable compromiso, las variables que influyen, y las alteradas por el mismo. El compromiso es considerado clave debido a su influencia en el rendimiento. La metodología que se ha seguido está basada en el proceso propuesto por Sterman [4]. El primer paso fue la definición del problema, el segundo paso la recogida de datos. El objetivo fue la definición de círculos de retroalimentación que componen el modelo conceptual (MC). En tercer lugar, se realizó la definición del modelo. Finalmente, el resultado obtenido es un modelo conceptual. La función principal de éste es facilitar la comprensión del comportamiento de la variable comportamiento mediante Pensamiento Sistémico. Este estudio contribuye a ambos campos de Gestión Estratégica de Personas (GEP), y Pensamiento Sistémico (PS). La mayor contribución para el PS es el hecho de combinar más de una fuente (Literatura+ Group Model Building + investigación previa) para la definición del modelo conceptual. La combinación de estas fuentes para la construcción de modelos PS no es común en la comunidad científica. Además, el uso de PS en GEP es limitada.

Palabras clave: Compromiso, Pensamiento Sistémico, Group Model Building, Gestión Estratégica de Personas.

1. INTRODUCCIÓN

The origin of this study is focused on a prior research called Bateratzen. It began in 2010 with the aim of helping managers to align people with the strategy of their organisations. This project was supported by the Regional Government of Gipuzkoa. The key activity in this project was the gathering of surveys with the objective of obtaining empirical evidence to help managers. Bateratzen database is composed of 510 companies and 72000 surveys. Among the diverse variables measured are commitment and performance.

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The effect of globalisation is especially significant in the case of Small and Medium Enterprises (SMEs) [5,6], which compose the database. In the current socio-economic context, the strategic reflexion of many companies has highlighted the necessity of organisational transformation to obtain more committed and more proactive workers [7]. These committed and proactive workers take an active role in achieving the strategic goals of their organisations. This transformation implies continuous dynamic learning. This is especially important at management level because managers have the power to implement changes and make them effective for the achievement of new value adding strategies. What is still unknown however, is how proactive workers can be encouraged and motivated to obtain a more competitive organisation. There is not a scientific base for helping companies to enhance more proactive worker behaviours [8].

There are diverse factors, which affect the complex situation of industrial SMEs. The economic crisis, the low cost products from foreign countries, the increased global competitiveness, the fast technological changes and the reduction of products cycle life among others [9]. The key to successful changes resulting in improved competitiveness, such as innovation (understood as a sustainable competitive advantage to guarantee the survival of companies), is based on the development of capacities, values, aptitudes and people behaviour rather than on the technical domain [10].

In spite of the logic of this statement, there is a question still unanswered: what are the people variables that should be activated to produce a positive effect on performance and competitiveness. This research contributes to give answer to this question. Commitment (high performance people management practice) was identified as a key factor for competitiveness, due to its direct effect on performance.

Thus, the main objective of this research is to understand the behaviour of commitment and to identify the variables that influence commitment and are influenced by it, using ST. The results were focused on the feedback loops that were fed by three input sources and directly influenced commitment in the CM.

2. SYSTEMS THINKING FOR MANAGING CHANGE

Systems Thinking is an approach that can assist in the resolution of top-management challenges. Systems Thinking helps to obtain the holistic view of the whole system [11].

Systems thinking has specific and beneficial qualities that make it an applicable tool for discussing complex systemic concerns [12]:

- (i) It focuses on the whole rather than parts, and stresses the role of cause and effect relationships.
- (ii) It is a circular rather than linear path. It is focused on “closed interdependencies”, where all the variables have an influence on the rest.
- (iii) It offers visual tools, such as causal loop diagrams and behavior over time graphs. These diagrams provide a wealth of implications and knowledge, and foster learning.
- (iv) It opens a window into our mental models, converting perceptions into explicit pictures that can reveal deep yet essential differences in viewpoints.

Challenges to be analysed with this technique are represented through feedback and causal loop diagrams (CLD). “When an element of a system indirectly influences itself it is called a feedback loop or a causal loop. More explicitly, a feedback loop is a closed sequence of causes and effects, that is, a closed path of action and information”[13].

3. METHODOLOGY: CONCEPTUAL MODEL (CM) DEFINITION

The definition of the CM was preceded by data collection from three different input sources, see Fig. (1).

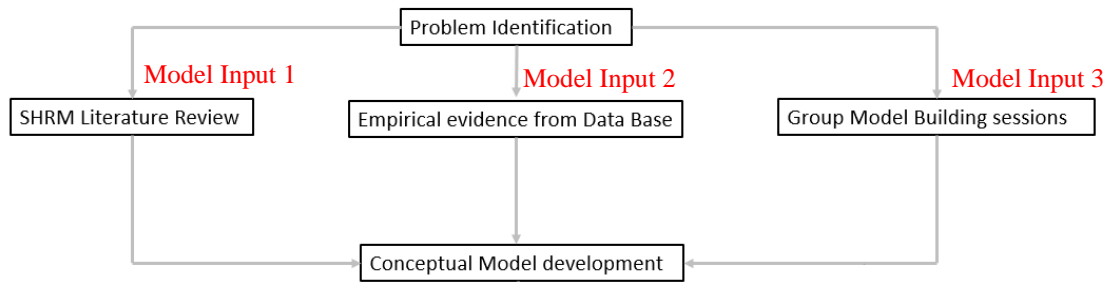


Fig. 1: Methodology framework

Firstly, the gap in the literature was defined (problem identification) to provide a clear focus for the subsequent phase. Secondly, input collection was done for the definition of the CM: (i) the Literature review, (ii) 11 Group Model Building (GMB) sessions with industrial companies, and (iii) empirical evidences from Bateratzen database. Following Samaniego-Guevara and Pascual-Barrera [14] this phase of input and variable identification was considered key. In their case an efficient variable identification was vital for the correct construction of the simulation model. Thirdly, CMs were developed. Six different iterations of the model were arranged. The reason for developing more than one version of the model was validation. Experts from the companies validated and proposed improvement for the model that is why different versions were obtained.

3.1. PROBLEM IDENTIFICATION: EMPLOYEES COMMITMENT

Building a sustainable competitive advantage is the final objective of companies, and several studies have reported large positive correlations between commitment and job performance [15,16,17]. Characteristics of commitment are described as the following: (i) high level identification with the objectives and values of the organisation, (ii) readiness to make extra effort for the benefit of the organisation and (iii) strong ambition to maintain membership in the organisation [18]. Thus, the score of the CM was commitment.

3.2. MODEL INPUTS

The model input sources were three as explained before (Literature, GMBs with companies and empirical evidences from Bateratzen). The model was composed of 16 loops. 40 % of them were collected from the literature, 80 % was defined from the GMB diagrams, and 26% was supported by the evidences from the database. There are five loops which were fed by the three input sources, and three loops which were gathered from two of the input sources.

This paper is focused on LOOP 2 (HPWS effect on commitment) and LOOPS 12-13-14 (The effect of Intensification, relocation, and automation on commitment). The reason for choosing these 2 loops is the combination of two facts: (i) these loops are fed by the 3 input sources, and (ii) these loops directly influence commitment, Fig. 2.

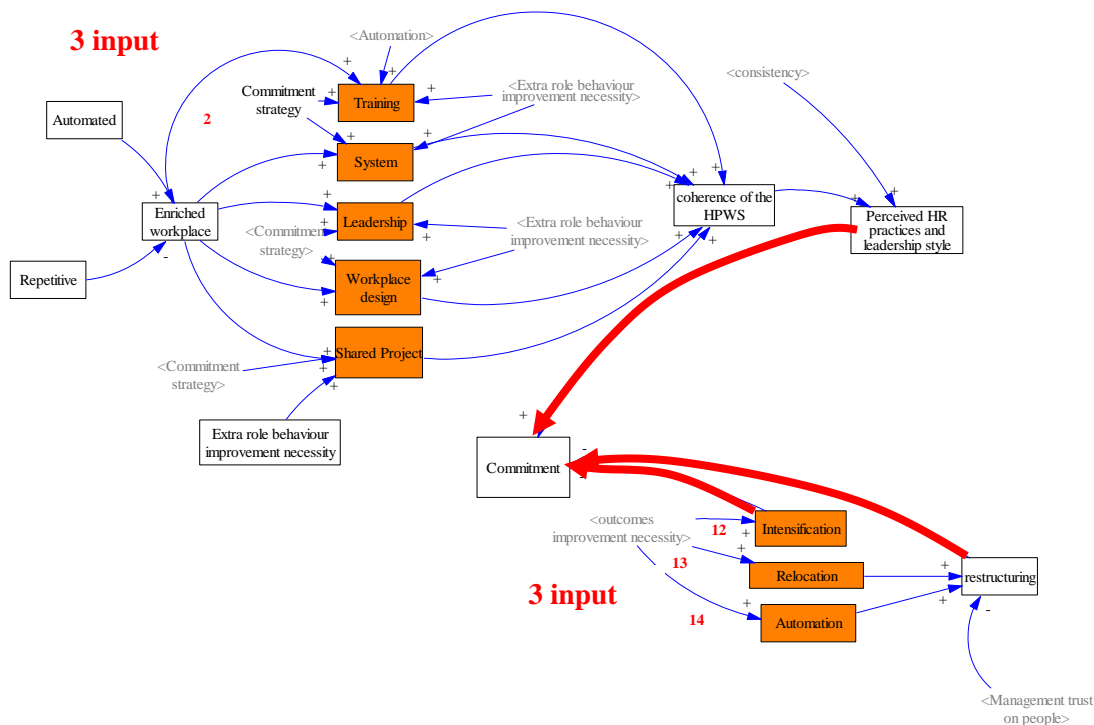


Fig. 2: Loop 2, and Loop 12, 13, 14

3.2.1 Model input 1: literature review about commitment antecedents

The variables selected for the CM of this research were High Performance Work Systems (HPWS). Human Resource (HR) management systems which work a commitment strategy instead of a control strategy are called in different way, i.e. “High Performance Work Systems”, “High Commitment”, “High Involvement” etc. [19]. These systems facilitate an improvement in the collective commitment due to its effect on performance. This statement defended that an internal coherent human practices system (horizontal adjustment) and aligned with business strategy is the foundation to develop capacities and encourage attitudes and behaviours which enhance performance [20-25].

SHRM suggested two different management strategies: control strategy, and commitment strategy [26,27]. The commitment strategy is investing on HR practices (such as autonomy, information, etc.) with the aim to engage people on organisational goals. In contrast, control strategy is based on narrowing the job, lowering wages, developing hierarchies in order to cut direct labour cost and increase productivity [26-29].

In Table 1 are shown the specific characteristics of each of the strategies proposed by Arthur [25]. The control strategy was called “Cost Reduction” because the main objective of “control” strategy is to reduce direct labour costs and other employment-related expenditures (i.e. training and employee involvement activities).

On the other hand, people commitment strategy is key for these companies pursuing a differentiation business strategy. The logic behind posits that engaged people are more flexible and more likely to adapt and make effects for the benefit of the business strategy. In this context, it is proposed that employees must have the skill and training to perform a variety of diverse tasks. Standardisation is reduced and decisions under conditions of high uncertainty aligned with the organisational goals are predominant [30-32]. In summary, offering skilled employees high levels of involvement, autonomy, and general training can be understood to be attractive and motivational for workers. In this way, the organisation will achieve qualified workers who are committed to their organisations.

Industrial Relations Functions	Type Of System	
	Cost Reduction	Commitment Maximizing
Organisation of Work	Job Tasks narrowly defined	Broadly defined jobs
Employee Relations	Very little employee influence over "management" decisions	High Level of employee participation
	No formal employee complaint	Formal dispute resolution procedures
	Little communication efforts	Regularly share business information with employees
Staffing/ Supervision	Low Skill requirements	High percent of skilled workers
	Intense supervision/control	Self - managing teams
Training	Limited training efforts	More extensive, general skills training
Compensation	Limited benefits	More extensive benefits
	Relatively low wages	Regularly high wages
	incentive based	All salaried/stock ownership

Table 1: Cost and commitment strategies [25]

As a result, both perspectives of “control” and “commitment” strategies were included through different variables in the CM.

3.2.2 Model input 2: Group Model Building

GMB is understood as a form of group decision support that involves stakeholders working with a team to solve a focused problem in a complex system [33].

The purpose of developing a considerable number of GMBs (11) was to obtain the saturation point, that is, the point in which feedback loops (the narratives or stories to explain participants contribution and reasoning for their problem using ST language) in the sessions were repeated. This procedure pursued a validity and robustness for the model. In addition, it must be noted that most of the feedback loops are also argued in the literature.

The specific process followed in this research was:

- Problem definition: this is the first stage where the challenge to be analysed in the session was presented to the participants with a clear and brief statement. An example of one of the companies that took part in this research is presented, facilitator presented the problem and together in consensus the challenge was stated as following:
 - A. Challenge/ problem: Formulation of the process in all the sessions: improvement of workers COMMITMENT to achieve a win-win relationship between: (i) people, well-being and feeling as a part of the organisation, (ii) organisation sustainability or competitiveness.
- Time horizon definition: The period of time to be analysed was defined. It should start as far back in history as necessary to show how the problem emerged and describe its symptoms. In this research 10 years was selected as time framework for both the sessions and the simulation. An oscillatory behaviour of commitment was defined in most of the sessions.
- Individual variable definition: Each participant listed the factors that positively or negatively affected the challenge of analysis. Post-its were given to each participant, and they defined one variable on each. This phase seems to be a Brainstorming where participants could write in the post-it whatever came to their mind.
- Opinion exchange: Lists of all variables were shared and explained in the group. Post-its were stack on the wall, the window or the whiteboard to show them to all participants.
- Final CM definition: The facilitator of the session included the variables raised by the group in the final model, always in consensus. Polarities of each relationship between the variables, and connections using arrows are also defined, see

Fig. (3) which is in Spanish because the sessions were developed in both Basque and Spanish. It must mentioned that the final diagrams were closed in the post work phase, that is, the models were refined and optimised in the office by the modellers (some feedbacks that were not closed in the sessions were reworked afterwards).

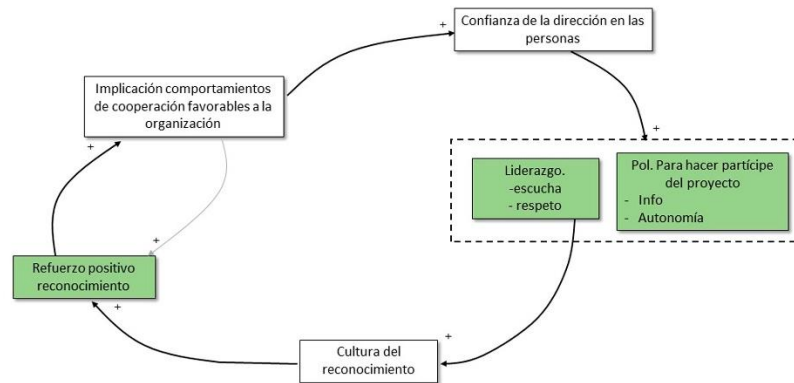


Fig.3: Final diagram of a GMB

- Validation round: 50% of the final diagrams were validated with the corresponding organisations. For this purpose, the facilitator met again with the participants of the session, and explained them each feedback loop initially and the whole in the end. Each relationship was commented and explained with them in order to validate or modify them.

3.2.3 Model input 3: empirical evidence from Bateratzen database

Bateratzen is composed of 510 companies and 72000 surveys. The main objective of using the database was to add factors that were not identified in GMBs either literature review, but empirical data showed they were significant.

1) Relationship between the size of the organisation and commitment.

The objective was to understand the relationship between the size of the organisation and commitment. According to the database a higher size of the company resulted in worse commitment. Small organisations (less than 50 workers) present higher commitment outcomes than bigger organisations, see Figure 4.

For this purpose, a correlation was developed. The Alpha Cronbach of commitment variable was 0.89. The reliability was assured when Alpha was higher than 0.7. The correlation with size was negative and statistically significant, Pearson correlation between the size of the organisation and commitment was - 0.248 and ($p < 0.01$). There were 422 organisations and 34707 surveys comprising the study sample.

Each circle in Fig. (4) represents an organisation. In the horizontal axis commitment was measured (2.5-6.0). In the vertical axis, the size of the company (0-3.5).

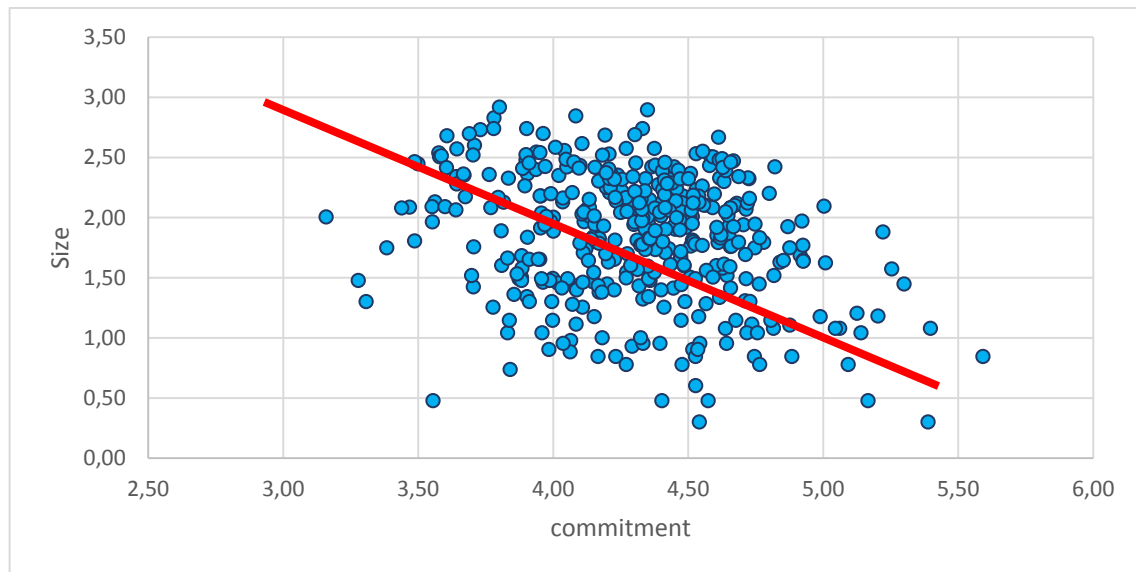


Fig. 4: Relationship between size and commitment level

So, it could be stated that a negative correlation exists between size of the organisation and workers level of commitment. This variable, size of the organisation, was included in the CM.

2) Job design

Job design was chosen as an input due to the proved influence on commitment presented in the database. For this purpose, two different analysis were developed. First, perceived HR practices were controlled in order to obtain a clear vision of the differences in commitment between direct and indirect labour. In this analysis perceived HR system of practices effect was neutralised to observe more clearly the importance of job design. For this aim, a weighted average was developed with no standardised residuals. After the comparison of the averages of the saved residuals, a comparison between direct and indirect labour was obtained through T-Student ($t= 6.23$; $p < 0.01$). Alpha Cronbach coefficient was 0.85 and reliability is assured, $\alpha > 0.7$.

Second, using these residual, a second comparison was done to understand the differences between sectors (automation and machine tool), ($t= 7.05$; $p < 0.01$). It is understood that tasks in automation are repetitive and unenriched. Machine tool is characterised by more enriched tasks (they work with projects rather than repetitive activities).

There were 35 organisations and 5700 surveys comprising the study sample. The objective of this weighted average was to test the differences produced in commitment due to job design.

Thus, job design appears to be a variable with considerable effect on commitment, as it is shown in the study people who work in unenriched workplaces are less committed to their organisation. As a result, this variable was included in the CM of this research.

3) Relationship between workload intensification and commitment

The main aim in this case was to analyse the correlation between productivity and commitment. According to the database workload intensification has a negative effect on commitment. As shown in Figure 5 the correlation between past productivity (measured as sales/employee) and current commitment (data from 2011) is negative and statistically significant: -0.32 ($p < 0.01$).

There were 103 organisations and 5705 surveys comprising the study sample. All the companies are operating in Spain.

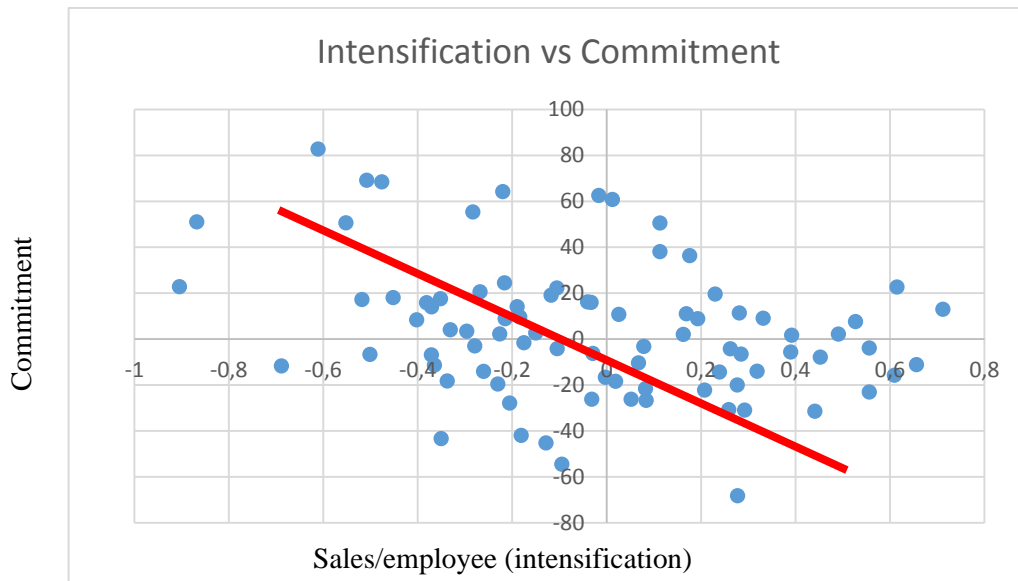


Fig. 5: Correlation between productivity and commitment

Consequently, intensification of workload is considered a significant variable before implementing any HR practice system, and it was included in the CM of this research.

As explained in Chapter 3.2 the focus of this paper were LOOP 2 and LOOPS 12-13-14.

LOOP 2: HPWS effect on commitment

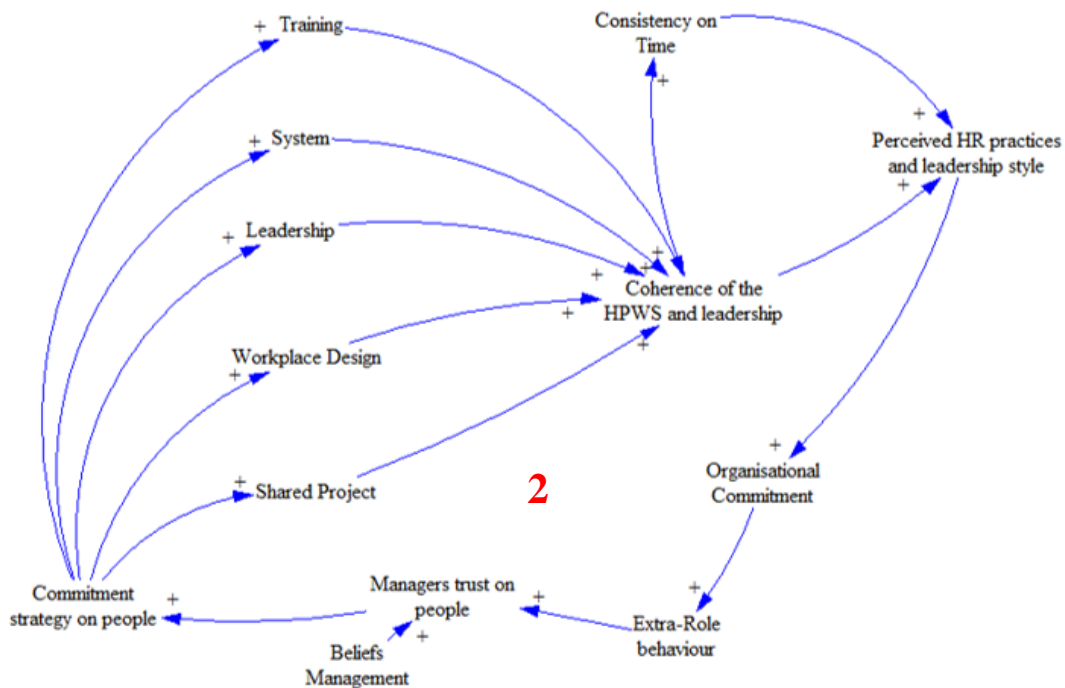


Fig. 6: HPWS effect on commitment

This loop, Fig. 6, was supported by the literature, GMB (10 repetition) and Bateratzen database (job design input from the database = workplace design). According to the GMBs, extra-role initiatives encourage managers' trust in workers.

As a result, people commitment strategy is consolidated throughout the organisation. When the implementation of these practices is perceived as coherent and consistent, commitment level is increased. As shown in Bateratzen job design appears to be a variable with considerable effect on commitment, people who work on unenriched workplaces are less committed to their organisation.

Commitment strategy on people enhances HPWS and Leadership implementation [20]. An effective implementation of these elements fosters people perception. The relationship between lever implementation and perceived levers (HPWS and transformational leadership) depends on the level of coherence of the implementation and their consistency in time [20-25,34]. Coherence and consistency of the implemented practices generate a “strong” organisational context [35].

The higher the “strength” of the system the more likely it is to perceive the HPWS practices and transformational leadership. When this perception is increased trust on people is higher. As a consequence, it is more likely to increase commitment. A higher commitment will encourage an extra-role behaviour, which at the same time will reinforce management trust on people.

Trust theory suggests that extra-role helps to improve trust level which reinforces commitment strategy. HPWS implementation perception, and transformational leadership contributes to better commitment level. All these relationships are shown in Becker et al. [36] and Wright and Nishii [37].

LOOP 12+ 13+ 14: The effect of intensification, relocation, and automation on commitment

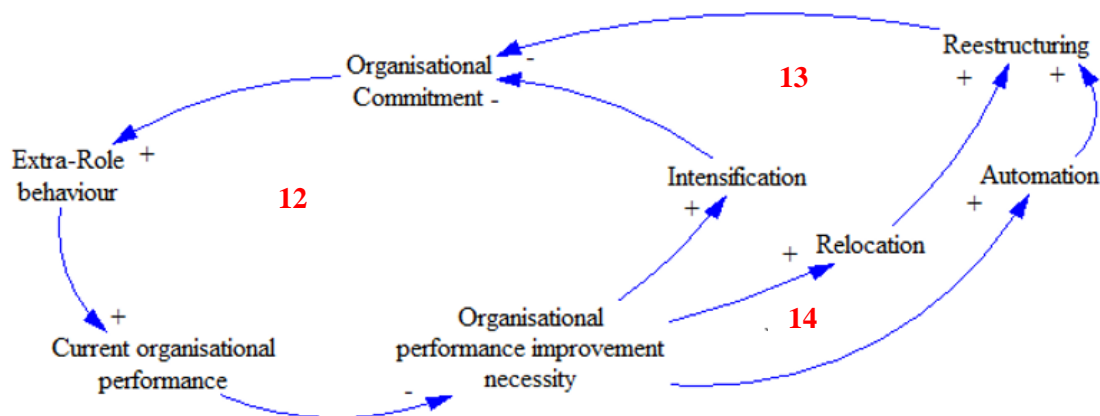


Fig. 7: Intensification, relocation, and automation as possible solutions for crisis


Loop 12 was collected from the GMB (3 repetition), the literature review and Bateratzen database (intensification of workload). The rest were collected from the GMBs (3 repetitions), see Fig. 7. In the GMBs undertaken in this research, relocation of the manufacturing processes in other low cost countries was proposed as a possible solution when necessity of outcome improvement existed. When extra-role behaviours were dominant performance, level was higher and consequently, the necessity to improve was lower. Restructuring is highly likely to occur in those situations, which results in a decrease in people commitment levels. This necessity sometimes result from the need for continuous growth. The resulting restructuring has a negative effect on commitment as it causes major disruption on workers.

Automation is the third strategy identified to solve outcome improvement necessity in the sessions. In these cases, the direct effect of automation was restructuring which once again influenced negatively commitment.

As shown in Chapter 3.2 workload intensification has a negative effect on commitment. The correlation between productivity and commitment was negative, higher intensification of workload turned in lower commitment level.

4. RESULTS AND DISCUSSION

This research was focused on the understanding of commitment using an ST model. The loops selected (2 and 12-13-14) as key for explanation were related to both HPWS and the coherence of its implementation. These loops were fed

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by three input sources and they were directly connected to commitment in the CM. It is tested that “commitment” strategy is beneficial for performance and it must be implemented coherently. On the other hand, short-term solutions such as intensification, damaged commitment, which in turn has a negative impact on performance.

As Loop 2 presented, the information gathered from the three different input sources was coincide. Participants in the GMBs defined a relationship between extra-role initiatives, trust in workers, people commitment strategy and coherence of the system. These relationships were supported by the literature, which defended that transformational leaders and commitment strategy enhance coherent implementation of HPWS. This encourages extra-role behaviours and results in higher levels of trust. In addition, the analysis developed in Bateratzen confirmed that unenriched job design (workplace design) variable, part of HPWS, has a negative influence on commitment.

Regarding Loop 12, 13, 14, it could be stated that the negative influence of intensification and restructuring on commitment was also supported by the three input sources. Participants in the GMBs, identified intensification, relocation and automation as the most frequent solutions proposed for performance improvement. Moreover, the analysis developed in Bateratzen also demonstrated that the higher the intensification, the lower the commitment.

5. CONCLUSIONS

The main objective of this research was to understand the behaviour of commitment and to identify the variables that influence commitment and are influenced by it, using ST. Three different input sources were used: i) Literature review, ii) 11 Group Model Building with different companies, and iii) empirical evidence from Bateratzen database. This variety is the key for the robustness.

The first input source was the literature review. Human resource practices can be divided into “control” or “commitment” practices [25,26], and both concepts have been included in our model which is unusual. The second input source were the eleven GMBs in different industrial companies, and the variables and feedback loops of which is defined the CM. It is also considered a value adding as it is not common to arrange so many sessions. The variety of sessions gave us the opportunity to achieve different feedback loops related to commitment. Finally, the third source came from empirical evidence from the Bateratzen (510 companies and 72000 surveys) database. This evidence has contributed to some new narratives about commitment in the workplace including: size of the organisation, workplace design, and intensification of workload.

The contribution and insights obtained from this research and according to the heuristic principles for model-based theory building (System Dynamics as Model-Based Theory Building) are also remarkable [38].

Issue Orientation: the model obtained in this research aims to understand the behaviour of commitment. This understanding appears to be very appropriate for obtaining middle-range theories, in this research the collection of interrelated 16 narratives belonging to the combination of three principal wide ranging theories (HPWS+ Leadership + Trust) can be considered a middle-range theory generation.

Generalisation: our computational model has been built basing on 11 GMB of different companies, and patterns of behaviour of a database supplied by 510 companies and 72000 surveys. The variety of input sources appears to ensure the generic character of the model.

Explanation: the CM helps to represent and explain which are the interrelationships between the variables part of commitment system and how they work.

The insights and understanding obtained from the present research provide a systems thinking view in the field of SHRM. This perspective enhances the understanding of the big picture due to the holistic view of the system it offers. Moreover, the use of ST models in the field of SHRM is very limited. Information found in the literature was mainly focused on fields such as, healthcare and project management. The principal explanation for this could be related to the difficulty of computerisation of “soft” and social variables. It is easier to translate quantifiable variables into mathematical equations rather than qualitative soft variables.

5.1 LIMITATIONS AND FUTURE LINES

Two limitations are identified in this research. First, all the companies that have taken part in the GMBs are industrial. Although the objective was to build a generic model, it could be said that this commitment understanding might not transfer effectively to other sectors. Second, all the companies that have taken part in the GMBs are from the same cultural and geographical region. So, the generality of the model could be debatable, this commitment understanding might not transfer effectively to companies from another region.

The principal future line is related to the construction of a simulation model using this CM. The technique that can be used is System Dynamics (SD). It offers an inherent flexibility which enables modellers to incorporate a wide range of influences specific to particular scenarios.

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