

# The Union Perspective of the Implementation of Industry 4.0: The Case of Mercedes-Benz

## *A Perspectiva Sindical da Implantação da Indústria 4.0: O Caso da Mercedes-Benz*

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### ABSTRACT

Organizational and technological innovations constantly challenge decision makers and the roles played by them. This is the background of the teaching case on screen. Based on the report of labor representatives, it aims to present a dilemma imposed by an adverse industrial context that feels the creativity and flexibility of decision makers, whether from the organization or from the labor representation bodies. In this way, students will have to act as organizational or union leadership so that they develop their creative thinking and find innovative solutions that often challenge the roles traditionally played by organizational agents. The dilemma that presents itself implies the need for teamwork and the ability to create consensus. The case privileges a point of view not always emphasized in the academic world, the trade union point of view.

**Key-words:** Innovation; change; decision making; trade unionism


### RESUMO

Inovações organizacionais e tecnológicas constantemente desafiam tomadores de decisão e os papéis desempenhados por estes. Este é o pano de fundo do caso de ensino ora em tela. Nele, a partir do relato de representantes trabalhistas, busca-se apresentar um dilema imposto por um contexto industrial adverso que exigiu criatividade e flexibilidade dos tomadores de decisão, sejam eles representantes da organização ou dos trabalhadores. Dessa forma, busca-se colocar o aluno no papel de liderança empresarial ou sindical a fim de que desenvolva seu pensamento criativo e encontre soluções inovadoras que muitas vezes desafiam os papéis tradicionalmente desempenhados pelos agentes organizacionais. O dilema que se apresenta implica em necessidade de trabalho em equipe e capacidade de criação de consenso. O caso privilegia um ponto de vista nem sempre enfatizado no mundo acadêmico, o ponto de vista sindical.

**Palavras-chaves:** inovação; mudança; tomada de decisão; sindicalismo

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## Introduction

The pursuit of enhanced competitiveness fuels discussions about organizational changes. Senge et al. (1999) emphasize that in many organizations, these changes are not implemented and sustained in an integrated manner, leading to a loss of focus, wastage of resources (time, financial, human), redundancies, and interdepartmental conflicts. These changes are predominantly discussed in academia from a managerial perspective, often neglecting the worker's viewpoint (Muniz Jr. et al., 2022; Muniz Jr. et al., 2023a,b), resulting in a weakness in manager training.

Every change requires attention to Work Organization, defined as the set of individuals composing an organization contributing to achieving its strategies, objectives, and goals. This includes full-time or part-time employees, temporary workers, freelancers, and third-party contractors working under the direct coordination of the organization (PNQ, 2005). Such organization consists of two subsystems: the technical subsystem – comprising machines, equipment, technicians, etc. – and the social subsystem – encompassing individuals and groups, their behaviors, abilities, culture, feelings, and all human aspects accompanying them (Biazzo & Panizollo, 2000).

According to the Sociotechnical School, individuals' behavior towards work depends on the organization of that work and the content of the tasks to be performed. Task performance and related feelings – responsibility, accomplishment, recognition, etc. – are crucial for an individual to derive pride and satisfaction from their work. The social and technical subsystems of a given work system must be considered together to achieve organizational objectives while promoting the development and integration of workers.

The scope of this teaching case is confined to the shop floor environment of the automotive industry. Biazzo and Panizollo (2000, p. 7) consider this industry a “microcosm” where production technologies and work organization issues are “crystallized” and can be observed. The term “shop floor” refers to the direct transformational work area, commonly known as the “factory floor” and referred to as the “workforce” in production processes by the National Quality Award (PNQ, 2005).

This teaching case addresses a real-life scenario involving the alignment of employer and worker interests to prevent the closure of an industrial plant. The em-

bedded testimonial emphasizes a real situation where consensus on a revitalization/modernization process based on Industry 4.0 presents itself as a potential solution for local managers and labor representatives, both concerned about job retention. The case incorporates theoretical arguments and union reports, engaging undergraduate or postgraduate students in a dilemma regarding labor relations. It can be explored in courses related to people management, such as HR, organizational behavior, and production management<sup>1</sup>.

## Historical Context

### THE AUTOMOTIVE SECTOR IN BRAZIL

Brazil is considered a peripheral country in terms of automotive production. In the 2000s, it accounted for 2.9% of global production, and by 2014, this figure had risen to 3.5% (Sarti & Borghi, 2017). Being perceived as a growing market, Brazil managed to attract new investments in the period leading up to the political-economic-health crisis that unfolded from 2016 onwards.

The national production has been under the control of multinational corporations from the global North since its inception, including prominent entities such as Ford, GM, Mercedes-Benz, and Volkswagen. The initial establishment of assembly lines in the country can be traced back to 1919 (Ford Motors Company) and 1925 (General Motors), both originating from American enterprises. As underscored by Sarti and Borghi (2017, p. 47), during its nascent stages, the sector operated in a state of “complete dependence on imports and assembly.” This paradigm underwent a transformative shift only in the 1950s with the advent of the import substitution process, initially championed by Getúlio Vargas during his second term and subsequently advanced by Juscelino Kubitschek’s administration through the implementation of the Goals Plan from 1956 to 1961.

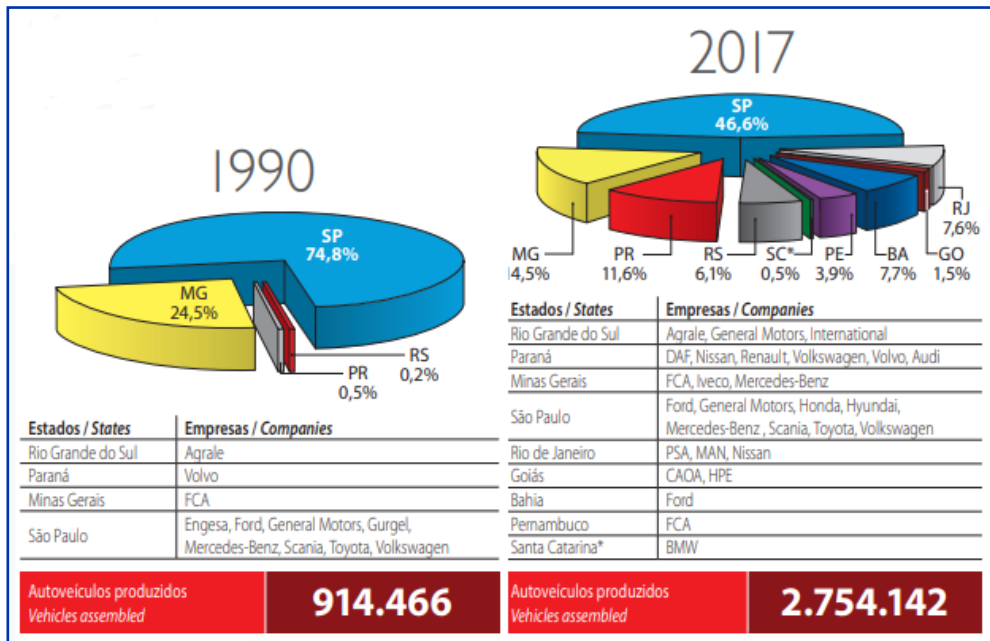
The 1990s marked another crucial period for the Brazilian vehicle industry due to the economic opening process. Import tariffs were reduced, and the prohibition of car imports was lifted. Noteworthy was the significant influx of capital “not only directed towards greenfield investments but also towards mergers and acquisitions” (Sarti & Borghi, 2017, p. 49). As a result, there was a substantial growth in national

production capacity. In 1997, production reached two million units, a figure only achieved again in the post-2004 period. The denationalization of production was also a characteristic of this period (Sarti & Borghi, 2017, p. 49).

According to Althunon and Landi (2020), the 1990s can be characterized as a second investment cycle experienced by the sector, marked by a decentralization of production. Between 1997 and 2007, 11 new automotive industry plants were established, with seven in the State of Paraná, expanding the number of new European manufacturers mostly concentrated in the Metropolitan Region of Curitiba (p. 8).

A new investment cycle occurred in the 2000s and 2010s (Althunon & Landi, 2020). This cycle was characterized by the arrival of companies, especially Asian ones, in the interior of the State of São Paulo, reinforcing “the strategy of these foreign companies in search of new emerging markets” (p. 9). This restructuring of the automotive production sector is illustrated in the figure below, comparing the percentage production by state.

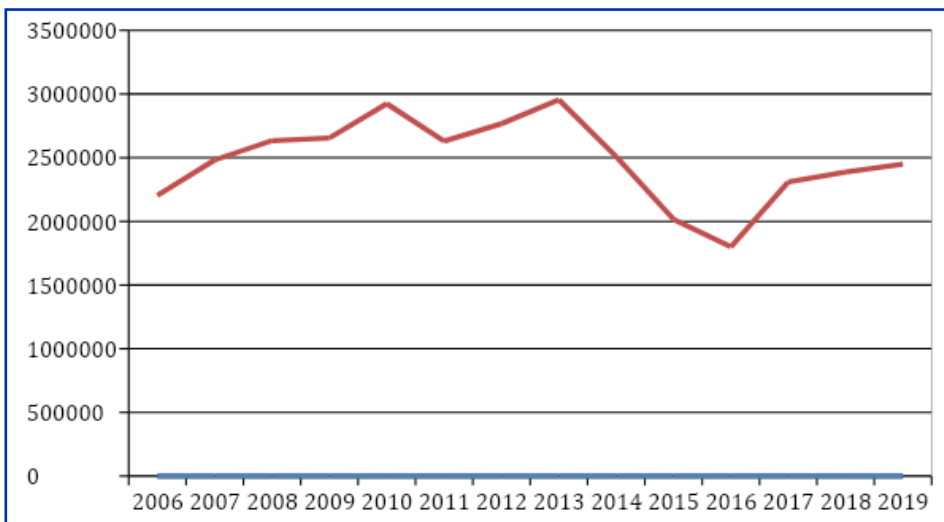
**Figure 1.** Vehicle production by state: 1990 and 2017



Source: Anfavea (2020).

In terms of production, according to Anfavea (2020), considering the period from 2006 to 2019 (as shown in the graph below), the following observations can be made: a continuous increase in production from 2006 to 2010, followed by a decline in 2011; a new recovery in the subsequent period; reaching the peak production in 2013 (2,955,788 vehicles); a significant decline in production from 2014 to 2016; a considerable recovery in 2017, followed by a modest rebound in the following years, bringing production levels close to those of 2014.

**Figure 2. Vehicle Production in Brazil**



**Source:** Anfavea (2020).

The decline in production that began in 2014 (as shown in the figure above) raises the hypothesis that the sector entered a new phase in its history, with more pronounced contours beginning to take shape during the political crisis of 2016, and the more definitive features becoming evident with the global Covid-19 pandemic starting in 2019.

It can be argued that the year 2016 was particularly significant for the metallurgical sector due to the announcement of the closure, in the same week, of three auto parts companies: Eaton, Maxion, and Randon (Rodrigues, 2021). The years 2020 and 2021 were not only significant but also emblematic, especially for the automo-

tive sector. Two reasons support this statement: the closure of the Mercedes-Benz factory in Iracemápolis in 2020 (Martins & Prado, 2022) and the announcement by Ford in 2021 declaring the end of production activities in the country (Rodrigues, 2021; Government..., 2021).

## THE INDUSTRIAL SCENARIO IN BRAZIL POST-LABOR REFORM

The labor reform approved by the National Congress in 2017 was presented as having both positive and negative aspects for workers, as outlined below:

**Table 1.** Positive and Negative Aspects of the Labor Reform

Positive Aspects	Negative Aspects
<ul style="list-style-type: none"><li>• Vacation can be divided into up to three periods.</li><li>• Equal conditions guaranteed for outsourced workers.</li><li>• Streamlining the process to receive unemployment benefits and withdraw pension (Employee Severance Fund).</li><li>• Permission for mutual termination of the employment contract.</li><li>• Lunch break is reduced to 30 minutes.</li></ul>	<ul style="list-style-type: none"><li>• Elimination of free assistance in the termination of the employment contract.</li><li>• Authorization for collective dismissal without union intervention.</li><li>• Restricted access to free legal representation.</li><li>• Permission for collective bargaining of conditions less favorable to workers than those stipulated by law.</li><li>• Unpaid overtime in "home office."</li></ul>

**Source:** Nascimento (2017).

However, for authors like Ramalho et al. (2019), the labor reform benefited the interests of companies by consolidating a reduction in labor protection and deepening job instability. This significantly unbalanced power relations, weakening unions and increasing company control over workers, encouraging job precariousness and the now legally sanctioned use of outsourcing (Ramalho et al., 2019).

Despite the implementation of the reform, the number of industries in Brazil has been declining since the recession of 2014, and between 2015 and 2020, the country lost an average of 17 factories per day (Agencia Estado, 2021). The recent and successive closures of automotive factories occupy headlines in the country's major media outlets, as outlined below:

- Ford announces the end of production in Brazil after a century and will lay off 5 thousand employees (Laguna et al., 2021).
- Mercedes-Benz closes factory and ends car production in Brazil (Estado Conteúdo, 2020).
- Toyota announces closure of oldest parts factory in Brazil (Barros, 2022).
- Caoa Chery suspends activities in Jacareí; union projects nearly 500 layoffs (Ohana, 2022).

The number of industrial jobs has fluctuated between 20% and 25% of the total employment in Brazil. In the automotive sector, the peak of employment occurred in 2013, reaching 532,364 positions. By 2017, it had decreased to 400,137, indicating a loss of over 132,000 jobs (Althuon & Landi, 2020, p.14).

## THE METALWORKERS UNION OF ABC

The Metalworkers Union of ABC (SMABC) led significant workers' strikes during the Brazilian military dictatorship, participated in the founding of the Workers' Party, and forged the "new unionism," characterized by union practices aimed at building workers' intervention in the workplace (Alves, 2000).

Partly, this practice emerged as a response to the deindustrialization in Brazil in the mid-1980s. According to Rowthorn and Ramaswamy, deindustrialization is "a persistent reduction in the share of industrial employment in the total employment of a country or region" (Oreiro & Feijó, 2010, p. 220).

In the 1990s, the ABC region of São Paulo underwent significant industrial transformation, marked by the relocation of plants to other regions. Duaibs (2009) highlights the taking place of a productive restructuring process that had impacts on both the organization of production and the actions of the union, as outlined below:

The industrial restructuring demanded changes in the operational approaches of the Metalworkers Union of ABC, which had to adapt to the new rules imposed by the market. Consequently, it sought to reformulate its strategies, approach, and objectives. Its focus shifted to job maintenance, the creation of new employment opportunities, and the fight to minimize high unemployment rates (Duaibs, 2009, p.1).

The Metalworkers Union of ABC (SMABC) aims to participate more directly in industrial changes to substantiate agreements with companies. Examples of

this approach include negotiation processes related to outsourcing, logistics, quality programs (Kaizen), job and salary restructuring, and profit-sharing. In this regard, SMABC's stance on the competitive modernization of plants is described as: "Not (...) in opposition to technological innovation but rather in the struggle for an effective correspondence between economic-productive transformations and the living and working conditions of the population" (Reestruturação Produtiva, 1998).

SMABC has representation in factories through the Union Committees of Enterprises (CSE), which constitute an organizational structure of workers in the workplace. The goal is to involve them directly in identifying points of demand, as well as in decision-making processes, with the intention of fostering a broader political awareness among metalworkers.

## **MERCEDES-BENZ IN BRAZIL**

The history of Mercedes-Benz in Brazil begins with the inauguration of the truck factory in the mid-1950s. Currently, the company has plants in São Bernardo do Campo-SP, Campinas-SP, Juiz de Fora-MG, and a test track in Iracemápolis-SP.

The Sao Bernardo do Campo Mercedes-Benz plant (MBSBC) was inaugurated in 1956 and became the first Industry 4.0 in the automotive sector for commercial vehicles, revolutionizing production systems, the work environment, and the human-technology interface. It employs around 10,000 direct workers for the manufacturing of trucks from the Accelo, Atego, Axor, Actros, and Arocs families (Sao Bernardo do Campo Mercedes-Benz, [n.d.]). MBSBC represents the largest plant of the company outside Germany and has a Professional Training Center linked to Senai within its premises, offering professional training courses to meet the technical needs of the company, such as qualifications related to Industry 4.0.

In March 2018, a new final assembly line for light and heavy trucks was inaugurated, incorporating Industry 4.0 concepts. This line integrates the most advanced technologies of connectivity, the Internet of Things (IoT), cloud storage, and Big Data & Analytics (Sao Bernardo do Campo Mercedes-Benz, [n.d.]).

The company has a Global Council with the following responsibilities: control and monitoring of executive management, approval of actions and investments, and planning long-term corporate actions. There is a position for a workers' represen-



tative, held by Valter Sanches from 2007-2018 (Brazilian Director is reelected to Daimler's World Council, 2013).

This sets the historical context for the case at hand. With that in mind, let's move on to the narrative (always in italics) obtained from SMABC unionists, who recount the discovery of the intention to close the MBSBC plant, as well as the negotiation process that allowed for the modernization into a 4.0 factory. Following this, teaching notes are presented, including suggestions for classroom activities.

## **CONFLICT MANAGEMENT: UNION PERSPECTIVE**

### ***The Discovery***

*In 2012, we began hearing rumors that Mercedes had plans to relocate the factory outside of São Bernardo. We spent some anxious time with these rumors, asking about it, but there was no reliable information. We sought information from MBB directors who were unaware of this decision. Due to our union structure, we consulted the workers' representative on Mercedes' global committee in Germany (headquarters), and he confirmed this information.*

*There was suspicion that the operation would move to the Mercedes plant in Juiz de Fora, and subsequently, an advanced discussion with the government of Pernambuco was confirmed, for reasons of tax incentives and port logistics.*

### ***The Union Intervention***

*Immediately, the union initiated a mobilization process through meetings with workers, followed by alignment with MBB directors. In 2013, we managed to draw the company's attention to engage in dialogue with the union to initiate the negotiation process. The union's perspective in the face of what was announced was to secure jobs through the modernization of the factory, reversing the possibility of closure. The initial dialogue with the company is summarized by the interviewees:*

*MBSBC: "Alright, so what do you want?"*

*SMABC: "We want future jobs at the São Bernardo plant."*

### ***Agenda proposition and Negotiation Process***

Once the negotiations were initiated, the negotiation process was triggered by defining the demands and counterpoints from both sides. In the case of work-

ers, plenary sessions were conducted to assess the company's proposal and build a shared understanding of what would be desirable and acceptable in a modernization process, resulting in points for the negotiation agenda. As reported by the interviewees:

*"The company presented 15 agenda items that included the outsourcing of some activities, the salary table issue, profit-sharing... So, we scheduled a series of plenary sessions with workers by area, and the factory was divided into several sectors: production, assembly, engine testing, truck and bus production. We called on workers to hold plenary sessions by area, clearly stating the situation and alternatives. The plenary sessions guided us, for example, not to discuss outsourcing the entire factory logistics."*

The negotiation process resulted in an agreement with the company's management, ensuring job retention and the continued operation of the factory:

*"In a General Assembly in November 2014, the agreement was reached, guaranteeing the continuation of all truck/bus production in São Bernardo through an investment for the production of a new truck family, already in the digital concept (site strategy)."*

The result of the negotiation process was positively evaluated by the interviewees:

*"We believe we are making progress because we are staying in the process of negotiating changes and intervening in the workplace. If it's not like that, we fall behind."*

To achieve this, workers agreed to some counterpoints, including an increase in the time for salary progression:

*"The salary progression that occurred every four months changed to every 8 months, meaning the time to reach the ceiling of the position increased to 8 years. The 1995 agreement allowed reaching it in 5.5 years, with a guarantee of inflation compensation for the period."*

### **SMABC's Modus Operandi**

The operation of SMABC is characterized by the effective participation of workers in the workplace, which helps represent the workers and, most importantly, share information and decisions with them. According to one of the interviewed

unionists, the union's modus operandi, characterized by open communication and workers' engagement in decision-making processes, is respected by the company:

*"In a way, the company respects this! It may not like it, as it would be easier not to have to discuss, but it respects what is happening. The dialogue is established! It respects because of our organization."*

### **The 'Digitization' of the Factory and Its Products with Job Maintenance**

*Despite the initial resistance from Mercedes-Benz Germany to reconsider the plan to relocate production outside of São Bernardo do Campo, investments and technical actions were made in 2017/2018 to produce the heavy-duty trucks Actros and Arocs within the Industry 4.0 concept.*

*There was an understanding that if SMABC did not keep up with the modernization processes adopted globally (e.g., I4.0, Kaizen), it would be left out of the negotiation table, and everything achieved to prevent the company from leaving São Bernardo do Campo would be lost if they opposed the modernization of the factory.*

This process required new learning:

*"SMABC started to appropriate the information to help lead the implementation (I4.0) with the concern of avoiding job reduction due to the efficiency increase generated by modernization... The union is seeking to understand how I4.0 works, and what you understand today is different tomorrow because changes are very fast. This demands a lot from the workers' union movement. [For example], in 2009, they didn't think about electric vehicles, and the high investment made in these new vehicles and this digital factory was not enough to produce the electric one... The digital issue isn't even finished, and the electric one is already on the radar."*

### **Lessons Learned**

During the negotiations, it became evident that the modernization process at hand differed from the productive restructuring that occurred in the 1990s:

*"The challenge in the 1990s,... in productive restructuring,... had more mechanical robots, today there's Artificial Intelligence, I4.0... It's like I said: it's a living thing, it's a constant change! In the 1990s, we already learned a lot. We learned that the modernization of the production process implies a change in how you execute and manage work and represent workers.*

*Our role (SMABC) in the discussion (of modernization) is not to prevent the coming of technology that helps the worker; it just cannot take our jobs away. For example, there were about thirty-nine logistics points in the factory, and now there are five. The replenisher used to request parts by phone or radio, and today they use a system and barcode scanning. [However,] the decision-making in the workplace still needs a human touch.*

Here arises a dilemma: to what extent and on what terms is it possible to accept modernization? Change imposes itself and brings potentially conflicting trends. On the one hand, initially, modernization brought concerns to the union, presenting itself as an inevitable process that represented the risk of massive job elimination, as happened in the 1990s. On the other hand, in the new historical moment, it proved possible to build paths that not only ensured job retention but also resulted in an improvement in the work process. It remains clear that in negotiations, it is up to the union to define with its representatives the general and desirable contours of this process.

## **DILEMMA**

The reader is invited to consider the following problem context: the union has just discovered that the company's headquarters is considering closing the plant in São Bernardo do Campo (SBC). As outlined earlier, the automotive sector is going through a delicate moment, characterized by factory transfers to greenfield regions and the closure of productive units (brownfield). The ABC region stands out as one of the main ones in terms of labor movement, especially in the context of the new unionism. Therefore, worker participation in decision-making processes, especially in a company with a Company Union Committee (CSE), is considered unavoidable.

As a union or industrial leader of the company, you face the challenge of negotiating an agreement that meets the interests of the category you represent while also being concerned about job preservation. It is worth noting that it is a large company, employing approximately 10,000 people, and is linked to a World Council. Therefore, the decisions made will certainly attract the attention of a wide range of stakeholders.

The lack of clarity about the decisions to be made generates apprehension among plant employees, who fear losing their jobs. Both the union leadership and the plant management are open to negotiations. Faced with a scenario of little in-

formation, informal communication, and distrust, it is imperative to develop a negotiation plan to reverse this situation and keep the factory operating in SBC. Factory modernization, through the implementation of Industry 4.0, emerges as a possible solution capable of reconciling the interests of both sides involved in the negotiation.

In summary, the presented situation depicts a dilemma generated by the need to align employer and worker interests to avoid the factory's closure, promoting its revitalization, the production of new products, and its modernization in the Industry 4.0 framework. Participants in this didactic exercise are challenged to assume both managerial and union perspectives, pointing out solutions and strategies to implement them. Therefore, the central dilemma of this case can be translated as follows:

What should be considered in a modernization process to be acceptable to the parties involved?

As complementary questions, we highlight the following:

- What points should be included in the negotiation agenda?
- In formulating the negotiation agenda: What is central and what is secondary? What is non-negotiable? What counterparts can be offered to ensure that central issues are secured?

## Teaching Notes

### RECOMMENDED USE

This teaching case brings to the classroom a real example of a truck factory closure process, which was eventually transformed into a modernization process. It is important for undergraduate and graduate students in business administration and related fields to reflect on guiding criteria for union-employer negotiations and the consequences of a factory closure, as reported by the press, and that have union and industrial leaders as protagonists. The university should qualify this debate so that the union-employer negotiation theme is incorporated into student education in a structured way. Although the case is described from a union perspective, it creates a scenario for the flexible construction of negotiation strategies for mutual gains between employer and employee.

## EDUCATIONAL OBJECTIVES

Reading and discussing this case should allow students to:

- Discuss and analyze the consequences of a factory closure and the union-employer negotiation process in a conflictive context;
- Reflect on negotiation from different perspectives, stimulating critical and contradictory analysis, proposing union-employer negotiation points regarding the management of technological change;
- Propose administrative and socioeconomic alternatives and consensual and feasible solutions for establishing an agreement to keep the factory running;
- Propose alternatives to increase the effectiveness of the technological change decision-making process through union-employer partnership;
- Develop the ability to work in teams.

## DATA SOURCES

The data for the preparation of the case were adapted from interviews with union leaders who sought to identify the implementation of Industry 4.0 at the Mercedes Benz truck assembly plant in São Bernardo do Campo iv. The interviews allow for debate in the classroom about a problem, led by leaders of the Metalworkers Union of ABC who represent social groups often silenced in academic texts. In parallel, a theoretical panorama is presented to contextualize the modernization process to retain the factory in SBC-SP and substantiate the real reports of workers.

## SUGGESTED CLASSROOM ACTIVITIES

A pre-class activity is proposed, in which students read the case and prepare a 5-minute video pitch to be posted for the teacher (e.g., classroom/moodle). The video should contain a summary of the case and answers to the following questions:

- What are the regional and national consequences of a plant closure?
- How to keep a factory operating competitively while maintaining jobs?
- What are the advantages of working in partnership in a negotiation?

- What are the difficulties of working in partnership in a negotiation?
- How to create cooperation between the company and the union in a conflictive context?

### **BOX For Pre-Class Activity**

Identify material on the theme of impacts of factory closures and openings in Brazil in available publications (newspaper articles, internet, YouTube), as an example, the following is suggested:

What are the impacts of the Toyota factory closure and the strike at Mercedes? | MÁQUINAS NA PAN <https://www.youtube.com/watch?v=fR-okQ0Hsw>

Closure of Ford factories impacts the economy and the lives of thousands of workers <https://www.youtube.com/watch?v=u6ccZQQLcLY>

In addition to Ford, other major companies are expected to promote mass layoffs in early 2021. <https://www.youtube.com/watch?v=nijgWkCJLHA>

**Source:** Authors.

The class for the case study discussion was planned to last 100 minutes and cater to a group of 30 students. It is suggested to organize the activity into 6 stages with an estimated total duration of 100 minutes.

#### **1. Introduction** (Estimated duration: 10 minutes):

The teacher will engage in a conversation with the students about the purpose of the exercise, the lesson plan, the context of factory closures, aligning information, clarifying perspectives, addressing doubts, and allowing students to express their opinions freely. The teacher may present one of the pitches.

#### **2. Meeting to Determine Negotiation Points** (Estimated duration: 20 minutes):

After the first stage, the teacher should divide the students into two groups of 3-4 students, representing two categories:

- Plant leaders (aiming to keep the factory competitive)
- Union leaders (aiming to maintain jobs and improve working conditions)

At this point, students should discuss the reality faced by their category and propose 10 to 20 negotiation points (alternatives). Each negotiation point should be recorded on half of an A4 sheet. The groups should decide on the 5 priority points for each group, understanding their pros and cons (points the group does not want to concede).

### **3. Negotiation Meeting between Union and Company Leaders** (Estimated duration: 30 minutes):

At this moment, the room reorganizes into pairs of groups (6-8 students), formed by a group of company leaders and one group of union leaders, who must reach an agreement containing 5 to 10 negotiation points (consensus). Each point of consensus should be fixed on the wall with tape. A representative will be selected to present stage 4.

### **4. Presentation of Agreements** (Estimated duration: 25 minutes - 5 min/group):

Each representative has 5 minutes to present the agreed-upon points.

### **5. Voting for the Best Agreement** (Estimated duration: 5 minutes):

Each student votes for the two best groups according to their judgment (cannot vote for their own group).

### **6. Final Discussion - Lessons Learned** (Estimated duration: 10 minutes):

Each student must record on paper the points they liked the most about the activity and, on a second sheet, the points they found challenging. The teacher collects the papers and discusses the results with the students.



## SUGGESTED THEORETICAL DISCUSSION FOR KEY CASE THEMES

In addition to the classroom activity suggested, the teacher may, at their discretion, promote theoretical discussions on one or more of the key case themes suggested below:

### **Industry 4.0**

In this topic, it may be advisable to discuss the benefits and challenges of implementing Industry 4.0. New technologies applied to the industrial sector include, for example, the Internet of Things (IoT), advanced robotics, 3D printing, artificial intelligence (AI), big data, among others (Ribeiro, Nakano, Muniz Jr., 2022). A wide range of denominations has been used for the new organizational paradigm related to them, including Manufacturing of the Future (USA), Advanced Manufacturing Technology and Smart Factory (USA), Future Manufacturing (England), Digitalization (Germany), Smart Manufacturing (Germany), and Industrie 4.0 (Germany). These designations are used to represent manufacturing of customized products produced in smaller batches, where most tasks are automated (Karre et al., 2017) through the integration of equipment, machines, and instruments, as well as the interconnection of suppliers, customers, and partners, in order to create an integrated network and a competitive value chain (Li, 2017).

In this context, robots perform simultaneous tasks, significantly reducing human interventions in organizational processes and, moreover, increasing productivity (Wollschlaeger, 2017). Industry 4.0 enables factories to deal with real-time learning and decision-making, supported by simultaneous communication of data between machines and processes in the production scope (Zezulka et al., 2016), through dedicated high-performance networks (Cyber Physical Systems - CPS), which also include data security (Lu, 2017). The dynamic integration promoted by CPS contributes to the planning, analysis, simulation, implementation, and maintenance of high-performance manufacturing processes (Lu, 2017). The new technologies not only transform the means of production and distribution of goods and services but also impact productivity, professional qualification, the environment, income distribution, and social well-being (OECD, 2017).

The Acatech Report (Schuh et al., 2017) associates the implementation of Industry 4.0 with social systems, culture, organizational structure, productivity, so-

cial well-being, sustainability, regional development, industrial competitiveness, and worker qualification. IndustriAll Global Union (2017) emphasizes that Industry 4.0 creates opportunities for different workers, provided they have access to (re)education, (re)qualification, and specialized training. What are the benefits and challenges of Industry 4.0, both for the company and its workers?

### **Knowledge Management**

Knowledge is a resource that aids in decision-making. The theme of Knowledge Management (KM) has attracted the attention of various disciplines involved in organizational dynamics. Easterby-Smith & Araujo (2001) state that learning and knowledge play a central role in this dynamics, and learning “better” and faster is a competitive advantage. Schoonhoven (2002), in the edition of the Organization Science journal dedicated to Knowledge Management, asserts that knowledge should be included in the General Theory of Administration, raising essentially the following questions: “What are the sources of knowledge in the organization?” and “What influences the extent to which knowledge is created, transmitted, disseminated, and used?” Knowledge Management is the systematic, formal, and deliberate act of capturing, preserving, sharing, and (re)using tacit and explicit knowledge created and employed by individuals during routine and process improvement tasks, in order to generate measurable results for the organization and individuals (Muniz Jr., Trzesniak & Batista Jr., 2009, Muniz Jr.; Et al., 2010, p. 303).

Kusterer (1978 cited in Devinatz, 2007, p. 4) points out that Taylorism has not succeeded in its goal of “de-skilling” and simplifying the work process. Aristotle (cited in Nonaka & Von Krogh, 2007) indicates three types of knowledge:

- **Phronesis:** translated as prudence, practical wisdom, and practical rationality. Faucher et al. (2008), based on the traditional classification: data, information, and knowledge, add Wisdom, which relates to Phronesis.
- **Episteme:** universal and context-free. Objective and explicit knowledge that can be interpreted as scientific knowledge.
- **Techne:** practical and specific technical know-how of the context, including personal skills with the work (craft).

Frank and Echeveste (2013) indicate that barriers to knowledge transfer and sharing are addressed in a scattered manner in the literature and can be synthesized as follows:

- **Personal:** related to individual and group factors, including competencies, techniques, motivations, and strategies.
- **Techne:** practical and context-specific technical know-how, includes personal work skills (craft).

Frank and Echeveste (2013) show that barriers to knowledge transfer and sharing are addressed in a dispersed manner in the literature and can be summarized as follows: 1. Personal, relating to individual and group factors, with skills, techniques, motivations, strategies; 2. Technological, which encompasses IT infrastructures, accessibility for the user, equipment. It is related to knowledge recording activities, information flow; 3. Organizational, which addresses strategies and practices related to product development, with its methods and activities. How could the union strengthen its knowledge of new technologies in order to contribute to negotiations?

### ***Enrichment of Work***

Companies dealing with complex technologies seek flexible specialization in organizing work so that skilled workers can work flexibly, operating in different production volume contexts and product varieties. In these work environments, the effort of the worker and tacit knowledge are crucial. While Taylorism and Fordism aimed at task fragmentation and division of labor, flexible specialization requires a reliable workforce. As a result of these demands, it is not surprising that the “human relations” school gained strength in advanced industrial economies during much of the late 1970s and early 1980s. Instead of task fragmentation, “job enrichment” (Hackman et al. 1976) became imperative in manufacturing. These developments are associated not only with changes in production systems (requiring higher worker qualifications and decision-making effort) but also with increasing pressures on managers to “humanize” work by reducing monotony, physical effort, and making work more “intrinsically” satisfying. This also occurred in the context of high employment rates, where workers could choose between companies to work for. In France,

for example, the three decades before the 1970s were characterized by full employment, allowing not only workers to be more demanding but also unions to assert their prerogative to achieve improvements for workers through work organization (Sorge et al. 2015: 262). In Germany, the “humanization of work program,” initiated in the 1970s, funded by the government and carried out in partnership with unions and employer associations, was a major catalyst for a comprehensive restructuring of work in its expanding manufacturing sector.

But what does “humanization of work” really mean? Hackman and Oldham (1976) propose that re-humanizing work requires making it more interesting and meaningful. Specifically, they propose five main dimensions of work that employers need to address to make work more meaningful:

- **Skill Variety:** defined by Hackman and Oldham as “the degree to which a job requires a variety of different activities in carrying out the work, which involves the use of various skills and talents of the individual.”
- **Task Identity:** The degree to which the job can be done from start to finish with a visible outcome.
- **Task Significance:** This dimension concerns how much a worker perceives that what they do on a day-to-day basis is meaningful to themselves but potentially also to others in society.
- **Autonomy:** This dimension concerns the extent to which employees feel they are given freedom at work to use their own work methods and discretion in problem-solving.
- **Feedback:** The last dimension is about how much workers receive timely feedback on the quality of their work and what might be needed to improve it. One of the key principles of performance management systems is that frequent feedback is provided to employees about their strengths and weaknesses and how to improve. A system that only measures, rewards, and punishes without providing meaningful feedback to employees would be perceived as weak (Based on Hackman & Oldham 1976: 257, Wintersberger & Muniz Jr., 2017).

Considering the above case, the question arises: How did modernization impact the work of MBSBC metalworkers?

### **New Unionism**

In this topic, a discussion is recommended regarding the role of the union in improving work processes from the perspective of workers. It is suggested that negotiation unionism, or new unionism, be taken as a basis. This constitutes an important milestone in the political and union action of the labor movement during the period of democratic transition. The emergence of new unionism dates back to the late 1970s (Antunes, 2014), a period when a cycle of workers' strikes erupted in the ABC region of São Paulo. The cycle of strikes that occurred between 1978 and 1980 brought a new political-union perspective to the core of the protest movements for two reasons: i. It broke with "union practices controlled by the dictatorship, primarily aimed at an assistance agenda" (Ladosky & Oliveira, 2015, p. 148), as well as with the populist unionism of pre-1964, led by the Brazilian Communist Party (PCB) and the Democratic Labor Party (PDT) (ibid, p. 149); ii. It consolidated a union practice based on grassroots involvement in workplaces, advocating for freedom, union autonomy, and a class perspective opposed to corporatism (ibid). As Antunes (2014) points out, it is worth noting that over time there is a detachment from the initially postulated frameworks. In this sense, the movement becomes institutionalized, hierarchy and bureaucratization replace grassroots involvement, confrontations are avoided, and a significant part of the attention turns to electoral politics. What were the main difficulties faced by MBSBC unionists? How were they overcome?

### **Co-management**

Co-management is a technique designed for the management of plural organizations. In many Western European countries, this technique is not only encouraged but is, in fact, a legal requirement. Germany serves as a prominent example in this regard. The practice of co-management is enshrined in the constitutional law of companies from 1952 (Carvalho, 1990). According to Faria (1982, p. 6):

Co-management [sic.] assumes that the worker should have a say in the organization of the company and, therefore, manifests itself at two levels: operational and strategic. In other words, co-management [sic.] operates at the level of technical work organization and at the level of the overall factory policy (Guilhem and Bourdet, 1976). Under co-management [sic.], the worker is not reduced to a mere instrumental role, as their initiative and creativity are reintegrated into the production processes, giving rise to the notions of 'job enlargement and job enrichment.' Workers themselves choose the best

means to achieve the proposed goals, as the manager does not leave the organization of the whole and the details of practical tasks solely to the leadership, since a certain degree of self-organization is granted to those performing the tasks. Participation takes on a broader, active, and intensive connotation as it is solicited. Thus, co-management [sic.] is configured in the determinations of the means to be used and how they should be used to achieve the objectives.

Considering the statement above and taking into account the case at hand, present the advantages related to co-management, both from an organizational and a union/labor point of view.

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## Notes

- i. The case and teaching notes were structured in light of the recommendation by Roesch and Fernandes (2006) and Roesch (2007).
- ii. The term "greenfield" refers to non-industrialized locations, while the term "brownfield" refers to already industrialized locations.
- iii. The term refers to the entities affected by the company's activities.
- iv. This case is the result of a research project developed under the CAPES PPrint & FAPESP projects.