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# Industry 4.0 and Proactive Works Council Members

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**Abstract:** Background: Integrating Industry 4.0 technologies in organizations affects employees' workplaces and working conditions. Works Council members play an essential role in this because as intermediaries of information between employees and management, they increase mutual trust and help introduce changes in the work environment. This article discusses the Works Council members' autopoietic endowments that are necessary for their proactive activity, which we discuss as building blocks for creating constructive relationships with management and quality energy in an organization. As such, we were interested in examining whether the autopoietic endowments of Works Council members influenced the type of relationship with the Works Council and management, and whether this relationship affected Works Council members' organizational energy. Methods: A questionnaire was developed, piloted and distributed to Works Council Members, and 220 completed questionnaires were returned. Results: We found that the higher the level of self-awareness, the better the relationship between Works Council members and management. Moreover, poor energy represented poor relationships, and poor relationships signified a higher degree of resigned inertia and corrosive energy. Conclusions: Our research provides managements with insights into the relationship between employees and management, and the quality of their organizational energy.

**Keywords:** organization; Industry 4.0; workers' participation; Works Council; Works Council members; autopoietic endowments; organizational energy; structural equation modeling



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## 1. Introduction

The fourth industrial revolution has brought great upheavals, especially with changes in economies and workplaces. With the automation of processes, workplaces are being shut down and, at the same time, new ones are being created that require new expertise and skills that enable quick adaptation and innovation. The essence of the fourth industrial revolution is not only in technology but also in changing the way we work and do business. Research shows that employment will increase in well-paid intellectual and creative jobs and low-paid manual jobs, while it will decline sharply in middle-paid jobs, which are primarily based on routine and repetitive processes [1]. An individual's employment will depend on their professional field, knowledge and experience, and will take place simultaneously as continuous development in the field of information systems. Employees in less demanding jobs will quickly lose their jobs and be unemployed if they do not acquire the appropriate competencies and qualifications [2]. More than one-third of employees are educated and trained every year in Slovenia, whereas the OECD (Organization for Economic Co-operation and Development) average is 40%. Of these, only 17% are low-skilled workers who can be most negatively affected by automation [3]. Organizations will also face more challenges by investing in adapting jobs to older people. This is also confirmed by the OECD 2020 economic survey for Slovenia, highlighting the need to mobilize underutilized labor resources, such as older and low-skilled workers [4].

Subsequently, incorporating Industry 4.0 technologies into production processes also affects and challenges employees' workplaces and working conditions [5]. Therefore, a

socio-technical approach is needed, which envisages employee representatives' proactive participation in planning and implementing changes [5]. This approach emphasizes that technology is not the only factor that determines the momentum of technological innovation, but that the organization and staff are equally important and influence each other [6,7].

Industry 4.0 therefore presents a unique challenge that requires proactive Works Council members [5]. In this article, we aimed to examine the autopoietic endowments of the Works Council members that are necessary for their proactive action [8]. One of the greatest challenges in integrating Industry 4.0 technologies is people, and the way people work in an organization is also influenced by differences in the relationship between the Works Council and management [9,10]. In this article, we examined the nature of the relationship between Works Councils and management. The behavior of employees can be influenced by people with a lot of energy [11], so we examined the energy of the Works Council members. Our research's contribution is in understanding the model of the influence of the autopoietic endowments of Works Council members, the relations between the Works Council members and management, and organizational energy.

## 2. Literature Review

Industry 4.0 refers to the intelligence of products and systems, their in-house networking and their cross-company integration in value-added networks [12]. Among all the changes that Industry 4.0 brings with it in industrial processes, digitization is the area that has the greatest impact on the macroeconomic and social environment [13]. The automation and robotization of production processes mainly affect those workers who carry out repetitive and routine work [14]. Industry 4.0 and the associated digitization also offer positive opportunities such as working time flexibility, greater independence, less repetitive work and less stressful work. On the other hand, digitization can impair the working life and the conditions for the compatibility and balance of work and private life if no new rules are defined or such rules do not exist [15]. To meet the demands of emerging types of work, different types of skill need to be developed to improve employability. In this context, employability is defined as a set of achievements—skills, understanding and personal qualities—that increase the likelihood that workers will be employed and more successful in the workplace [16].

There are different types of challenge in implementing Industry 4.0 projects, and the role of people is a crucial element. Motivating employees and gaining their trust to participate in Industry 4.0 projects are central; otherwise, there is a threat that they will oppose the introduction of such projects. Therefore, the challenge for Industry 4.0 projects is to support employees not to resist changes. A clear message from management about planned changes in activities is therefore needed [17]. The management is assisted by Works Council members, who, as intermediaries of information between employees and management, can increase the level of mutual trust and contribute to the introduction of changes [18]. The European Trade Union Confederate (ETUC) project's results on digitalization and worker participation [15] showed that positive opportunities do not arise automatically but must be proactively designed. Therefore, the participation of the Works Council members in change management must be ensured and active. Practices in some European Works Councils have been described as positive and, in others, as significantly inadequate. These differences result from the (un)willingness of management to cooperate and the lack of resources and knowledge by employee representatives. In this context, one of the more worrying results of the survey is that almost one-third of respondents expect a weakening of employee participation and the erosion of collective bargaining at the national and/or company level to be among the principal risks of digitization [15].

Current technological innovations open up the potential scope for co-decision action by Works Councils. Works Councils primarily represent the interests of employees, particularly concerning employment prospects. However, no less important is maintaining collaboration with the management, geared towards increasing efficiency and investing in

digital technologies. Therefore, the position of the Works Council is crucial for introducing digital technologies in companies [18].

Works Councils' effects on human resource management vary according to the type of relationship between the Works Council and management. Pfifer [9] defined three types of relations of Works Councils with management that define the role of the Works Council in the management's decision-making in an organization, which are that the Works Council is consistent with most decisions; that they may have differing views, but a consensus is reached; or decisions are made that are not in line with Works Council. The first two types of relationship are cooperative, while the relationships under Number Three show little interest in cooperating with the management or reaching an agreement. Differences in the relationship between Works Councils and management affect human resource management. Research has shown that organizations benefit from collaborative Works Councils and experience more problems if the relationship between Works Council and management is lacking [9].

Works Council members' proactive action is essential for strengthening good interpersonal relations, to which their autopoietic endowments contribut: self-awareness, imagination, conscience and independent will. The development of all four of these human qualities is crucial to an individual's proactivity. None of them should be neglected, whilst the essence is in the synergy or relationship between them. The proactive model defines a person's free choice between response and stimulus, and in this freedom of choice, human self-awareness, imagination, conscience and independent will are crucial [8]. The quality of an individual's performance determines the moment between stimulus and response, as people think and react differently. Successful people do not react instantly but first think about what is happening and then decide on the most appropriate response [19].

For a deeper understanding of how organizations can reach their full potential, the concept of energy is becoming a valuable tool. Energetic employees are essential for the organization's success, while people with much energy are more productive and creative, and positively impact others [11,20]. Research shows that organizational energy, which consists of productive energy, comfortable energy, resigned inertia and corrosive energy, can benefit individuals and organizations [21]. Productive organizational energy includes employees' emotional, cognitive and behavioral potential, which, in turn, helps in a more comprehensive study of employee behavior [21]. For organizations to become more humane systems, they must discover the inner strength to balance their energies [22]. Organizational energy describes the human forces shared by managers and employees in organizations and not just the individuals' energy. The concept of organizational energy extends these human qualities to the total energy of the organization. Thus, individually oriented energy concepts can help the management understand and encourage individual employees' full engagement [23].

Integration of Industry 4.0 technologies face many managerial and process challenges. Khan and Turowski explained that Industry 4.0 is currently facing challenges involving different scenarios to harness its strengths and potentials. However, frameworks and step-by-step approaches are needed to realize these scenarios. The authors discussed the term Industry 4.0 and explained that we need changes in our traditional production systems due to new business models, company competition and innovation gaps. They highlighted new opportunities and possible applications by introducing new tools and technologies, and the need for a better understanding of technology, business models and their applicability in organizations to achieve the greatest benefits. They emphasize a comprehensive approach: cooperation platforms where stakeholders can exchange information securely and confidentially [24]. Luthra and Mangla [25] examined Industry 4.0 as a concept for supply chain sustainability in emerging economies. They discussed how Industry 4.0 includes environmental protection and control initiatives, as well as security measures for sustainable supply chains. However, these initiatives are not straightforward due to numerous challenges. They noted that organizational challenges are paramount, followed by technological and strategic challenges and legal and ethical issues [25]. Georg, Katenkamp

and Guhlemann examined the relationship between Works Councils and digital devices based on a qualitative study. They found that the design of 'Work 4.0' raises questions about the role of employees and their representatives in digital transformation [26].

Sanchez, Exposito, and Aguilar [24] explained that Industry 4.0 is a key integration challenge involving several actors from the Internet of Everything (IoE), i.e., people, data, services, and things. They proposed an approach to analyzing integration challenges within Industry 4.0 using five integration levels: connection, communication, coordination, cooperation and collaboration (5 C). They presented a case study from an integration perspective that envisaged, among other things, autonomy and self-organization to turn a traditional industry into a smart factory in terms of the Industry 4.0 concept [24].

Industry 4.0 and its associated digitalization heralds a fundamental transformation of industry and services. In addition to significant job challenges such as changes in employment and working conditions, it also challenges Works Council members in representing employee interests [10]. Haipeter [10] cited research showing that digitization poses a unique challenge for Works Council members who need training to carry out digital projects. Digitization touches on several issues that are difficult to delineate and are covered in specific provisions, especially as Works Councils are often not adequately informed about digital technologies and their implications. Thus, the priorities of Works Councils relate to employment security, working conditions, training, and the field of management, internal communication and business processes. While the first three areas fall under the classic codetermination of Works Council members, leadership and communication belong more to the area of 'corporate culture', for which Works Councils have a fundamental responsibility. Although communication of decisions and leadership problems are not directly related to digitization, Works Council members contribute to setting limits for raising the level of digitization by representing workers' interests. Based on the findings on the workplace's digitalization process and the challenges that follow, Works Councils could create a foundation on which to gain knowledge to assess the impacts of technological change [10].

Table 1 summarizes the key findings on the role of integrating Industry 4.0 and the related challenges. Our paper's central position follows Haipeter's findings that acquired knowledge and a strategic view of issues and goals could strengthen Works Councils' position towards the management and be directly applicable as a source of energy and direction for action [10].

**Table 1.** Key findings of Industry 4.0 integration.

| Author | Year | Key Highlights |
| --- | --- | --- |
| Khan A.; Turowski K. | 2016 | Motivating employees to participate in I4.0;<br>Changing the mindset of employees not resisting change.<br>Clear communication from the management is required. |
| Reuter, M.; Oberc, H.; Wannöffel, M.; Kreimeier, D.; Klippert, J.; Pawlicki, P.; Kuhlenkötter, B. | 2017 | Integrating Industry 4.0 technologies affects working conditions.<br>Socio-technical approach—proactive employee participation in planning and implementing I4.0 technologies. |
| Georg, A.; Katenkamp, O.; Guhlemann, K. | 2017 | When designing 'Work 4.0', questions arise about the role of employees and their representatives in the digital transformation. |

**Table 1.** *Cont.*

| Author | Year | Key Highlights |
| --- | --- | --- |
| Genz, S.; Bellmann, L.; Matthes, B. | 2018 | Works Council members, as intermediaries between employees and management, can strengthen mutual trust and contribute to greater innovation activities. |
| Luthra, S.; Mangla, S. K. | 2018 | Organizational challenges, technological and strategic challenges, and legal and ethical issues when integrating I4.0 for supply chain sustainability. |
| Sanchez, M.; Exposito, E.; Aguilar, J. | 2020 | Five levels of integration I4.0 or 5 C: connection, communication, coordination, cooperation and collaboration (5 C). |
| Haipeter, T. | 2020 | I4.0 and the challenges of Works Council members in employment security, working conditions, training, management, internal communication and business processes. Strategic view of the issues and objectives strengthens the position of Works Councils towards the management, and be directly useful as a source of energy and direction for action. |

Given that one of the major challenges for integrating Industry 4.0 technologies is people, Works Council members play an important role in planning and implementing change [5,10]. The Works Council's role is to look after the highest possible quality of working life in line with the organization's goals. To achieve workers' participation, Works Council members need, in addition to strong interest in and professional knowledge of the workers' representatives, endowments for proactive representation of their co-workers [8]. Moreover, the treatment of people in the organization is influenced by differences in the relationship between Works Councils and management [9,10].

As such, the purpose of our research was to examine the autopoietic endowments and organizational energy of Works Council members and to determine the types of relationship between Works Councils and management in Slovenian organizations. Our basic premise was that there is a connection between these areas. Thus, the hypotheses were developed:

**Hypothesis 1.** *The autopoietic endowments of Works Council members have a statistically significant effect on the type of relationship between the Works Council and management.*

**Hypothesis 2.** *The type of relationship between the Works Council and management has a statistically significant influence on the Works Council members' organizational energy.*

The results can contribute importantly to more effective implementation of workers' participation in the implementation of Industry 4.0 technologies. Learning about digitalization in the workplace and the challenges involved requires clear strategies and the utmost attention to the crucial factors to success. These factors also include workers' participation and the level of implementation, which largely depend on the type of relationship between the Works Council and management. This area is an essential but often overlooked aspect

in practice that nevertheless contributes to improving the working lives of employees and the economic performance of organizations.

## 3. Research Methods

We used a questionnaire as a measuring instrument to collect information for the research. The questionnaire was developed based on two existing questionnaires [8,27]. We then translated the questionnaire for measuring autopoietic endowments from English into Slovenian, and calculated the inter- and intra-rater reliability, which were 0.94 and 0.97, respectively.

The questionnaire was piloted with 10 Works Council members who did not participate in the overall study. The reliability of the questionnaire was calculated using Cronbach's alpha. The results for internal consistency are noted below under 'Research Results'. The questionnaire was then sent electronically through the Association of Works Councils of Slovenia to all 925 members of the association in 112 organizations in Slovenia. Data collection via the survey took place from 30 January 2020 to 30 April 2020. In total, 220 Works Council members responded to the invitation to participate in the research, which represented a response rate of 23.8%.

The following statistical methods and tools were used: descriptive statistics, confirmatory factorial analysis, structural equation modeling, multinomial logistic regression, path analysis, Chi-square test ($\chi 2$), Cronbach's alpha test, root mean square error of approximation (RMSEA), comparative fit index (CFI), the Tucker–Lewis index (TLI) and the standardized root mean square residual (SRMR).

## 4. Analyses and Results

### *4.1. Data Analysis*

Data from the research results were transferred from the 1KA OneClick Survey program and statistically processed. The results were analyzed using the statistical program IBM SPSS 23.0. Tables and graphs were prepared using Microsoft Word and Excel version Office 365.

Data were processed with frequency and descriptive statistics, and correlations between key variables were examined. The variables' constructive validity was confirmed by confirmatory factor analysis, and their internal consistency was calculated using Cronbach's alpha coefficient. The SPSS program was used for statistical calculations, and the R program was used for modeling the structural equations. To verify the influence of autopoietic endowments on the type of relationship of the Works Council with management, and the autopoietic endowments and types of the Works Council's relationship with management on organizational energy, we used multinomial logistic regression. We first reviewed the relationships among autopoietic endowments, organizational energy and the type of relationship between the Works Council and management. Using models of structural equations, we then evaluated the model of the influence of autopoietic endowments on the type of relationship of Works Council members with management, as well as the influence of autopoietic endowments and the type of relationship of Works Council members with management on organizational energy. We used the path analysis method, which represents an approach to estimating relationships in a structural equation model based on simple bivariate correlations. In this way, we determined the strength of the paths, which we showed using path diagrams. The quality of the estimated models of structural equations was determined based on Chi-square ($\chi 2$) statistics, with the help of which we checked the perfect fit of the model to the data. If the value of the $\chi 2$-statistic was statistically insignificant ($p > 0.05$), the model fitted the data perfectly. The fit of the model to the data was also checked using the RMSEA (root mean square error of approximation) value, which was less than 0.08, which showed the good fit of the model. We also used the CFI (comparative fit index), the value of which was greater than or equal to 0.90, and the TLI (Tucker–Lewis index), the value of which was greater than or equal to 0.95, to confirm the fit of the model to the data. Finally, the fit of the model to the data was checked

using the SRMR (standardized root mean square residual) value, which should be less than 0.08 in the case of a good fit of the model to the data. We then evaluated the models' parameters, with the help of which, we checked the relationships between the dependent and independent variables defined in the model. We checked both the estimates of the regression coefficients that determined the influence of the independent variables on an individual dependent variable, and the estimates of covariance that determined the model's mutual covariance of the independent variables. The results are presented using a path diagram, in which the relationships are presented as arrows. The independent variables' influences on the dependent ones are presented as a one-way arrows running from the independent variable to the dependent one, and the value of the estimated regression coefficient was added to the arrow. Statistically significant effects ($p < 0.05$) are shown with a full, highlighted arrow; statistically insignificant effects ($p > 0.05$) with a dashed arrow (see Figure 1). Covariance between independent variables is presented as two-way arrows, and the covariances' values were added to them, with statistically significant values ($p < 0.05$) being emphasized. In this way, a more transparent insight into the analyzed variables' relationships is presented [28].

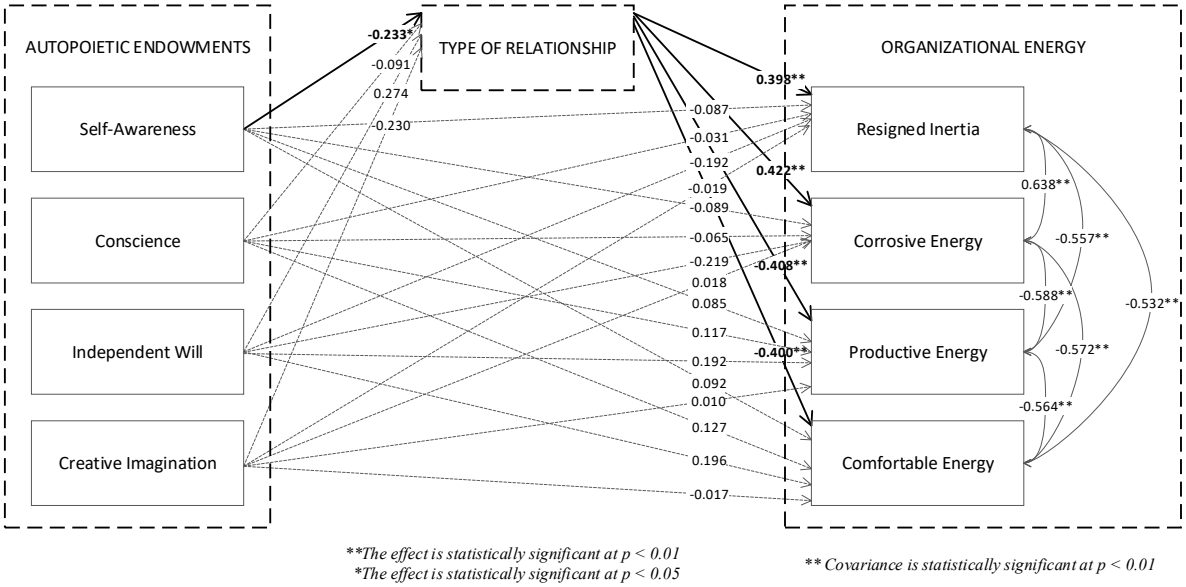


**Figure 1.** Evaluation of the structural equations model of the influence of autopoietic endowments on the type of relationship of Works Council members with management and the influence of autopoietic endowments and the type of relationship of Works Council members with management on organizational energy.

### *4.2. Research Results*

First, we present the variable results that reflect the relationship between the Works Council and management or describe the Works Council's role in making management decisions. Most respondents reported (see Table 2) that their Works Council often has a different opinion, but in the end, a consensus is reached (85 respondents or 38.6%). The number of respondents who reported that the Works Council is in line with the management in most decisions from the outset was also closely behind (82 respondents or 37.3%). Nevertheless, respondents also reported that decisions often have to be enforced against the Works Council (53 respondents or 24.1%).

**Table 2.** Relations between the Works Council and management.

| | | f | % |
|---|---|---|---|
| Which statement best describes the role of the Works Council in making management decisions in your organization? | Works Council is in line with the management in most decisions from the outset. | 82 | 37.3 |
| | Works Council often has a different opinion, but in the end, a consensus is reached. | 85 | 38.6 |
| | Decisions often have to be enforced against the Works Council. | 53 | 24.1 |
| | Total | 220 | 100.0 |

In our model, autopoietic endowments are an integral factor, which we assumed, based on the literature review, would influence the dependent variables, i.e., on Works Council members' organizational energy and the relationship between Works Council members and management.

The following is a summary and analysis of the sets of variables used to measure autopoietic endowments. Table 3 shows descriptive statistics for all four sets of statements. The results showed that all mean scores are quite high, between 3.3 and 4.5 (based on a five-point scale).

**Table 3.** Autopoietic endowments by dimensions.

| | | *n* | Mean | Median | SD |
|---|---|---|---|---|---|
| Self-Awareness | Am I able to stand apart from my thoughts or feelings and examine and change them? | 220 | 3.61 | 4.00 | 0.85 |
| | Am I aware of my fundamental paradigms and the impact they have on my attitudes and behaviors and the results I am getting in my life? | 220 | 3.90 | 3.89 | 0.68 |
| | Am I aware of a difference between my biological, genealogical, psychological, and sociological scripting—and my own deep inner thoughts? | 220 | 3.64 | 4.00 | 0.84 |
| | When the response of other people to me—or something I do—challenges the way I see myself, am I able to evaluate that feedback against deep personal self-thought and learn from it? | 220 | 4.05 | 4.00 | 0.75 |
| Conscience | Do I sometimes feel an inner prompting that I should or shouldn't do something I am about to do? | 220 | 3.36 | 3.00 | 0.91 |
| | Do I sense the difference between 'social conscience'—what society has conditioned me to value—and my own inner directives? | 220 | 3.57 | 4.00 | 0.90 |
| | Do I inwardly sense the reality of universal principles such as integrity and trustworthiness? | 220 | 4.00 | 4.00 | 0.88 |
| | Do I see a pattern in human experience—bigger than the society in which I live—that validates the reality of principles? | 220 | 3.45 | 3.00 | 0.85 |
| Independent Will | Am I able to make and keep promises to myself and others? | 220 | 4.47 | 5.00 | 0.59 |
| | Do I have the capacity to act on my own inner imperatives even when it means swimming upstream? | 220 | 3.99 | 4.00 | 0.84 |
| | Have I developed the ability to set and achieve meaningful goals in my life? | 220 | 4.08 | 4.00 | 0.74 |
| | Can I subordinate my moods to my commitments? | 220 | 3.74 | 4.00 | 0.86 |
| Creative Imagination | Do I think ahead? | 220 | 4.33 | 4.00 | 0.68 |
| | Do I visualize my life beyond its present reality? | 220 | 3.45 | 3.00 | 1.06 |
| | Do I use visualization to help reaffirm and realize my goals? | 220 | 3.39 | 4.00 | 1.03 |
| | Do I look for new, creative ways to solve problems in a variety of situations and value the different views of others? | 220 | 4.16 | 4.00 | 0.72 |

Note. *n*, number of respondents; SD, standard deviation.

To measure the reliability of the instrument, we used Cronbach's $\alpha$, which, on average, for all four autopoietic endowments of Works Council members, showed an acceptable level ($\alpha > 0.7$) of internal consistency [29] (N.B.: Even when eliminating certain variables, Cronbach's alpha did not increase).

A validated questionnaire [9] was used to measure autopoietic endowments that were divided into four sets: self-awareness, conscience, independent will and creative imagination. The interrelationship was checked by means of correlations between the questions measuring autopoietic endowments (see Table 4). Most of the questions within the individual sets of autopoietic endowments were at least moderately strongly related: the values of the correlation coefficients are between 0.3 and 0.9. In some cases (i.e., conscience: 1/4; independent will: 1/2, 1/4, 2/4, 3/4; creative imagination: 1/2, 2/4), the correlation coefficients's values are between 0.2 and 0.3, which means a weaker correlation but is still deemed satisfactory.

**Table 4.** Correlations between measurements of autopoietic endowments.

| | | | **1** | **2** | **3** | **4** |
|---|---|---|---|---|---|---|
| Self-Awareness | 1. | Am I able to stand apart from my thoughts or feelings and examine and change them? | 1.000 | | | |
| | 2. | Am I aware of my fundamental paradigms and their impact on my attitudes and behaviors and the results I am getting in my life? | 0.443 | 1.000 | | |
| | 3. | Am I aware of a difference between my biological, genealogical, psychological, and sociological scripting—and my own deep inner thoughts? | 0.403 | 0.737 | 1.000 | |
| | 4. | When the response of other people to me—or something I do—challenges the way I see myself, am I able to evaluate that feedback against deep personal self-thought and learn from it? | 0.337 | 0.526 | 0.468 | 1.000 |
| Conscience | 1. | Do I sometimes feel an inner prompting that I should or shouldn't do something I am about to do? | 1.000 | | | |
| | 2. | Do I sense the difference between 'social conscience'—what society has conditioned me to value—and my own inner directives? | 0.332 | 1.000 | | |
| | 3. | Do I inwardly sense the reality of universal principles such as integrity and trustworthiness? | 0.420 | 0.445 | 1.000 | |
| | 4. | Do I see a pattern in human experience—bigger than the society in which I live—that validates the reality of principles? | 0.247 | 0.399 | 0.360 | 1.000 |
| Independent Will | 1. Am I able to make and keep promises to myself and others? | | 1.000 | | | |
| | 2. Do I have the capacity to act on my own inner imperatives even when it means swimming upstream? | | 0.260 | 1.000 | | |
| | 3. Have I developed the ability to set and achieve meaningful goals in my life? | | 0.445 | 0.366 | 1.000 | |
| | 4. Can I subordinate my moods to my commitments? | | 0.295 | 0.277 | 0.286 | 1.000 |

**Table 4.** *Cont.*

| | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| Creative Imagination | 1. Do I think ahead? | 1.000 | | | |
| | 2. Do I visualize my life beyond its present reality? | 0.280 | 1.000 | | |
| | 3. Do I use visualization to help reaffirm and realize my goals? | 0.314 | 0.670 | 1.000 | |
| | 4. Do I look for new, creative ways to solve problems in a variey of situations and value the different views of others? | 0.363 | 0.224 | 0.316 | 1.000 |

Table 5 shows the descriptive statistics for the sets of statements used to measure organizational energy. Comparatively, we found that the mean score on a five-point rating scale was lowest in resigned inertia and corrosive energy, where the means ranged around 2. These two energies were, therefore, less present in the working environments of the participants. However, productive energy and comfortable energy were more present, where the participants had much higher self-assessed claims; on average, these revolved around 3.5 and 4.

**Table 5.** Organizational energy by dimensions.

| | | *n* | Mean | Median | SD |
|---|---|---|---|---|---|
| Resigned Inertia | I feel discouraged at my job (I feel fear). | 220 | 1.75 | 2.00 | 0.889 |
| | I have a feeling that my department has no future. | 220 | 1.91 | 2.00 | 1.090 |
| | I feel that in my department, nothing can be changed. | 220 | 2.33 | 2.00 | 1.124 |
| | I feel exhausted. | 220 | 2.54 | 2.00 | 1.156 |
| Corrosive Energy | I get lost in the excessive number of work activities. | 220 | 2.72 | 3.00 | 1.082 |
| | I often guess about the objectives and guidelines in my department. | 220 | 2.26 | 2.00 | 1.044 |
| | In my department, there are a lot of rumors. | 220 | 2.62 | 3.00 | 1.155 |
| | In my department, there are unsolved conflicts. | 220 | 2.11 | 2.00 | 1.146 |
| Productive Energy | I am proud of my work (of what I do). | 220 | 4.21 | 4.00 | 0.772 |
| | I am very loyal to the organization. | 220 | 4.22 | 4.00 | 0.925 |
| | I regularly get feedback on my work performance. | 220 | 3.26 | 3.00 | 1.187 |
| | We solve problems in teams and workgroups. | 220 | 3.53 | 4.00 | 1.136 |
| Comfortable Energy | I feel relaxed at work. | 220 | 3.70 | 4.00 | 0.941 |
| | I am satisfied with the situation in my department. | 220 | 3.55 | 4.00 | 1.099 |
| | At work and in my organizational role, I work according to established patterns. | 220 | 3.54 | 4.00 | 0.824 |
| | Relations between colleagues within my department are calm. | 220 | 3.85 | 4.00 | 0.917 |

Note. *n*, number of respondents; SD, standard deviation.

Similarly, as with autopoietic endowments, the measurement's reliability was analyzed using Cronbach's alpha and the same measurement reliability scale [29]. Based on the results of the Cronbach's alpha coefficient (Table 5), we further analyzed whether reliability could be improved by removing potential nonfunctional indicators in a single set [30], and Cronbach's $\alpha$ reliability values were also calculated for cases where an individual variable was removed from a single set.

Compared with the presented values of the Cronbach's coefficient $\alpha$ before excluding an individual variable, the value of Cronbach's coefficient $\alpha$ in the case of the sets of resigned inertia, corrosive energy and productive energy did not increase when the individual variable was eliminated; therefore, the set's reliability did not improve (see Table 6). In the case of the comfortable energy set, the value of Cronbach's coefficient $\alpha$ increased significantly when we removed the variable 'At work and in my organizational role, I work according to established patterns'. We found that due to the excluded statisti-

cally nonsignificant variable, the comfortable energy set's reliability improved, as the value of Cronbach's coefficient $\alpha$ increased from 0.587 to 0.707 (see Table 6).

**Table 6.** Analysis of reliability with variables with a statistically insignificant contribution excluded from the set of comfortable energy.

| | *n* | Mean | Median | SD | Cronbach's Alpha * | Cronbach's Alpha ** |
|---|---|---|---|---|---|---|
| Resigned Inertia | 220 | 0.00 | −0.16 | 0.959 | 0.823 | 0.823 |
| Corrosive Energy | 220 | 0.00 | −0.23 | 0.996 | 0.717 | 0.717 |
| Productive Energy | 220 | 0.00 | 0.20 | 0.952 | 0.704 | 0.704 |
| Comfortable Energy | 220 | 0.00 | 0.21 | 0.944 | 0.707 | 0.587 |

Note. *n*, number of respondents; SD, standard deviation. * After excluding an individual variable; ** before excluding an individual variable.

To measure organizational energy, we used a validated questionnaire [27], according to which, the statements used to measure organizational energy consisted of four sets: resigned inertia, corrosive energy, productive energy and comfortable energy. The interrelationship was checked using correlations between the organizational energy measurement statements presented in Table 7.

**Table 7.** Correlations between organizational energy measurement statements.

| | | | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|
| Resigned Inertia | 1. | I feel discouraged at my job (I feel fear). | 1.000 | | | |
| | 2. | I have a feeling that my department has no future. | 0.462 | 1.000 | | |
| | 3. | I feel that in my department, nothing can be changed. | 0.458 | 0.755 | 1.000 | |
| | 4. | I feel exhausted. | 0.588 | 0.495 | 0.484 | 1.000 |
| Corrosive Energy | 1. | I get lost in the excessive number of work activities. | 1.000 | | | |
| | 2. | I often guess about the objectives and guidelines in my department. | 0.313 | 1.000 | | |
| | 3. | In my department, there are a lot of rumours. | 0.283 | 0.398 | 1.000 | |
| | 4. | In my department, there are unsolved conflicts. | 0.323 | 0.419 | 0.577 | 1.000 |
| Productive Energy | 1. | I am proud of my work (of what I do). | 1.000 | | | |
| | 2. | I am very loyal to the organization. | 0.492 | 1.000 | | |
| | 3. | I regularly get feedback on my work performance. | 0.259 | 0.263 | 1.000 | |
| | 4. | We solve problems in teams and workgroups. | 0.393 | 0.362 | 0.532 | 1.000 |
| Comfortable Energy | 1. | I feel relaxed at work. | 1.000 | | | |
| | 2. | I am satisfied with the situation in my department. | 0.508 | 1.000 | | |
| | 3. | At work and in my organizational role, I work according to established patterns. | 0.052 | 0.104 | 1.000 | |
| | 4. | Relations between colleagues within my department are calm. | 0.314 | 0.509 | −0.032 | 1.000 |

All statements (Table 7), within the individual organizational energy sets, are at least moderately strongly related: the values of the correlation coefficients are between 0.3 and 0.9. Only in the case of the variable 'At work and in my organizational role, I work according to established patterns' can we see a very weak connection with other variables in the comfortable energy set. Again, it turns out that the variable in this set is problematic.

Following this, we predicted the dependence of the type of relationship between the Works Council and management on autopoietic endowments and the influence of both autopoietic endowments and the type of relationship between the Works Council and management on organizational energy. Using structural equation modeling, we evaluated the model of the influence of autopoietic endowments on the type of relationship of Works Council members with management, as well as the influence of autopoietic endowments and the type of relationship of Works Council members with management on organizational energy. The results are shown in Table 8, and the model with parameter estimates are shown in Figure 1.

**Table 8.** Evaluation of the structural equations model of the influence of autopoietic endowments on the type of relationship of Works Council members with management and the influence of autopoietic endowments and the type of relationship of Works Council members with management on organizational energy.

| Dependent Variable | Independent Variable | Estimate | Standard Error of Estimate | z | *p* | Standardized Value | $R^2$ |
|---|---|---|---|---|---|---|---|
| Resigned Inertia | Self-Awareness | −0.087 | 0.073 | −1.194 | 0.232 | −0.087 | 0.304 |
| | Conscience | −0.031 | 0.116 | −0.270 | 0.787 | −0.031 | |
| | Independent Will | −0.192 | 0.121 | −1.580 | 0.114 | −0.192 | |
| | Creative Imagination | −0.019 | 0.092 | −0.204 | 0.838 | −0.019 | |
| | Type of Relationship | 0.398 ** | 0.065 | 6.101 | <0.01 | 0.398 | |
| Corrosive Energy | Self-Awareness | −0.089 | 0.077 | −1.154 | 0.248 | −0.089 | 0.322 |
| | Conscience | −0.065 | 0.120 | −0.538 | 0.591 | −0.065 | |
| | Independent Will | −0.219 | 0.124 | −1.758 | 0.079 | −0.219 | |
| | Creative Imagination | 0.018 | 0.093 | 0.191 | 0.849 | 0.018 | |
| | Type of Relationship | 0.422 ** | 0.067 | 6.334 | <0.01 | 0.422 | |
| Productive Energy | Self-Awareness | 0.085 | 0.077 | 1.106 | 0.269 | 0.085 | 0.367 |
| | Conscience | 0.117 | 0.112 | 1.044 | 0.296 | 0.117 | |
| | Independent Will | 0.192 | 0.124 | 1.554 | 0.120 | 0.192 | |
| | Creative Imagination | 0.010 | 0.097 | 0.100 | 0.920 | 0.010 | |
| | Type of Relationship | −0.408 ** | 0.063 | −6.501 | <0.01 | −0.408 | |
| Comfortable Energy | Self-Awareness | 0.092 | 0.077 | 1.192 | 0.233 | 0.092 | 0.362 |
| | Conscience | 0.127 | 0.109 | 1.162 | 0.245 | 0.127 | |
| | Independent Will | 0.196 | 0.121 | 1.617 | 0.106 | 0.196 | |
| | Creative Imagination | −0.017 | 0.098 | −0.169 | 0.866 | −0.017 | |
| | Type of Relationship | −0.400 ** | 0.063 | −6.324 | <0.01 | −0.400 | |
| Type of Relationship | Self-Awareness | −0.233 * | 0.091 | −2.563 | 0.010 | −0.233 | 0.065 |
| | Conscience | −0.091 | 0.146 | −0.625 | 0.532 | −0.091 | |
| | Independent Will | 0.274 | 0.171 | 1.605 | 0.108 | 0.274 | |
| | Creative Imagination | −0.230 | 0.143 | −1.610 | 0.107 | −0.230 | |

** The effect is statistically significant at $p < 0.01$. * The effect is statistically significant at $p < 0.05$. RMSEA = 0.038 ($p = 0.991$); $\chi^2 = 567.595$ ($p < 0.01$); CFI = 0.982; TLI = 0.979; SRMR = 0.072.

According to the values of the $\chi^2$ statistic (Table 8), which are statistically significant ($p < 0.01$), we found that the estimated model does not fit the data perfectly. However, with the assistance of the remaining measures, we can still talk about the acceptable fit of the model to the data. The value of RMSEA is less than the limit of 0.08 (RMSEA = 0.038), the SRMR is also less than the limit of 0.08 (SRMR = 0.071), the CFI index is greater than 0.90 (CFI = 0.982) and the TLI index exceeds the limit value of 0.95 (TLI = 0.979).

The results showed that the influence of self-awareness on the type of relationship between the Works Council and management is statistically significant and is negative (b = −0.233; $p = 0.010$). For the variable, 'type of relationship between the Works Council and management', a value of 1 means the best possible relationship and a value of 3 means the worst possible relationship. Given that a lower value of the variable means a better

relationship, the result showed that increasing the value of self-awareness by one unit will improve the type of relationship between the Works Council and management by 0.233 or that higher self-awareness, as one of the autopoietic endowments, led to better relations between the Works Council and management.

Furthermore, we found that the influence of the variable 'type of relationship between the Works Council and management' explained 30.4% of the resigned inertia variance, 32.2% of that in corrosive energy, 36.7% of that in productive energy and 36.2% of the variability in comfortable energy. The model also showed the statistically significant effects of the variable 'type of relationship between the Works Council and management' on all organizational energy variables. The impact of the type of relationship between the Works Council and management on resigned inertia was positive (b = 0.398; $p < 0.01$); the same applies to the impact on corrosive energy (b = 0.422; $p < 0.01$). Given the other variables in the model, it is expected that as the value of the variable 'type of relationship between the Works Council and management' increases by one unit, resigned inertia and corrosive energy will also increase. Given that a higher value of the variable 'type of relationship between the Works Council and management' means a more inferior relationship, as the relations between the Works Council and management deteriorate, the levels of resigned inertia and corrosive energy increase.

On the other hand, the impact of the type of relationship between the Works Council and management on productive energy was negative (b = −0.408; $p < 0.01$); the same also applies to comfortable energy (b = −0.400; $p < 0.01$). This means that, given the other variables in the model, it is expected that when the value of the variable 'type of relationship between the Works Council and management' increases by one unit, productive energy and comfortable energy will decrease. Let us consider again that the increase in the value of the variable 'type of relationship between the Works Council and management' means a poor relationship. This means that a deterioration of relations between the Works Council and management also reduces productive energy and comfortable energy levels, and vice versa. By improving the Works Council and management's relationship, the levels of productive energy and comfortable energy increase.

We can summarize that all types of organizational energy were statistically significantly influenced by the type of relationship between the Works Council and management. Among the autopoietic endowments, self-awareness had a statistically significant influence on the type of relationship. As such, the better the relations between the Works Council and the management are, the more the organization is characterized by productive energy and comfortable energy, and, conversely, we can see a lower level of resigned inertia and corrosive energy.

Accordingly, we can conclude that a higher level of self-awareness leads to better relationships between the Works Council and management. Better relationships lead to higher productive energy levels and comfortable energy, and lower levels of resigned inertia corrosive energy in the organization.

## 5. Discussion and Conclusions

Involving as many employees as possible and reforming organizational processes can be achieved by managements through a participatory way of working. In addition to managers, Works Council members can also be of great assistance with organizational processes, particularly because they are supposed to be role models for their colleagues. Works Council members can be viewed by the management as ambassadors of change, who transfer a new way of thinking into their work environments and thus influence the employees' relationships, all of which are key to achieving the organization's goals [9]. The integration of worker participation into the daily way of working includes asserting a positive attitude towards life, understanding one's strengths and limitations, and values such as respect, trust, openness and diversity [31]. The concept of organizational energy is also focal, as it places great emphasis on meaningful work and people's internal motivation [32].

Given that one of the biggest challenges for Industry 4.0 is people, energetic members of Works Councils can help managements. Through their proactive action as intermediaries of information between employees and the management, they can increase mutual trust, and help plan and implement changes in work environments. Organizations are in an evolutionary phase, tied to the individual's development and awareness and her/his intuition in close connection with spirituality. One's awareness of power and its impact on the power of connection and creation stems from one's life energy and is becoming a winning factor for both the individual and the organization. Employees are increasingly connecting based on intellectual capital and value systems [31]. Informal forms of cooperation are increasingly emerging, approaching natural forms of coexistence and development. If, in previous evolutionary stages, the source of business system development was differently formed teams, in a conscious environment, it has become an increasingly crucial holistic individual, open to continuous learning, creative cooperation and networking in all directions within and outside the organized group, and working towards progress, with a positive attitude towards life and the world, and the realization of one's purpose [31].

Such individuals who demonstrate purposeful action have two key characteristics: energy and focus [33]. Purposeful action differs from impulsive behavior in that it involves thought, analysis and planning. We strengthen our energy with intense personal commitment and involvement. Focusing, however, is focusing on a specific result. Instead of merely reacting to what is happening, focused employees are goal-oriented [33]. This means that they take the time to think regularly about their actions.

Industry 4.0 offers opportunities for those employees who use the innate human abilities that robots find most challenging to reproduce at work. Therefore, education systems should improve human skills such as reasoning and problem solving, social and emotional skills, providing expertise, teaching and developing others, and creativity. Industry 4.0 requires new qualifications and new qualification combinations, as well as the resulting changes in education and training policy [34]. Employability skill development emphasizes lifelong learning, as skills can also be developed through on-the-job training with structured human resource development strategies [13].

Therefore, Works Council members' goal should be to pro-transform themselves into strong personalities who operate based on four principles: (1) Through conscience, connecting the power of intention, task and the power of principles; (2) through creative imagination, imagining new possibilities and creative ways to realize them; (3) through self-awareness, setting goals on a realistic basis, taking into account new findings and experiences; (4) with an independent will, choosing the purpose and means to realize the idea [8]. In this way, morally and intellectually more advanced individuals can pull co-workers into action and thus gradually influence the organization's development [35].

Such Works Council members will be able to participate in the planning and implementation of changes in the organization and, in doing so, discover and analyze the actual needs or interests of employees. The fourth industrial revolution has brought changes in technology, and in the way of working and conducting business, and we highlight the autopoietic qualities of Works Council members that are necessary for their initiative to ensure proactive engagement and the quality of life in the organization.

When introducing changes, it is necessary to mention education in the 21st century, for which management has several important instructions [36]. Future education is supposed to focus on developing self-awareness, which is the human ability to separate oneself and examine one's thinking, motives and history. Self-knowledge enables each individual to become aware of their social and educational roots, and strive to change for the better. It is also essential to develop other autopoietic endowments [36]. The conscience of the individual is related to the wisdom of ethical conduct and compliance with the laws. In doing so, it is important to act in one's own best interests and, at the same time, for the benefit of others. It is also necessary to encourage the individual's creative imagination, which is defined as the power to imagine the direction for which one is responsible both as a person and as an expert [36]. This quality allows a person to see oneself and the people

around one differently and from a new perspective. Finally, an independent will gives a person the power to transcend one's patterns and act based on principles instead of responding based on emotions and circumstances [36].

The following three conclusions can be made: (1) In Hypothesis 1, we argued that the Works Council members' autopoietic endowments have a statistically significant influence on the type of relationship between the Works Council and management. The research results showed that the type of relationship between Works Council and management was statistically significantly influenced by the autopoietic endowments of self-awareness; namely, higher self-awareness was reflected in better relations between the Works Council and management. (2) In Hypothesis 2, we argued that the type of relationship between the Works Council and management has a statistically significant impact on the Works Council members' organizational energy. The research results showed that all types of organizational energy were statistically significantly influenced by the type of relationship between the Works Council members and management. It was indicated that the better the relations between the Works Council members and management, the more the organization was characterized by productive energy and comfortable energy. On the other hand, we saw a lower level of resigned inertia and corrosive energy. Poorer relations between the Works Council and management reflected the poorer energy of Works Council members and vice versa; better relations between the Works Council members and management reflect better Works Council members' energy. (3) There was a connection between the dimensions of organizational energy; specifically, resigned inertia and corrosive energy were mutually positively connected and, at the same time, negatively connected with productive energy and comfortable energy. These were positively related to each other. Industry 4.0 recognizes the importance of maintaining collaboration between the Works Council and management, geared towards increasing efficiency and investing in digital technologies. Therefore, the position of the Works Council is crucial for introducing digital technologies in organizations [18]. This article helps us to understand the influence of the autopoietic endowments of Works Council members on the nature of their relationship with management in organizations introducing digitalization. Recognizing that self-awareness affects the type of relationship between the Works Council and management can help understand interpersonal relationship management. Differences in the relationship between Works Councils and management affect human resource management [9].

The findings contribute to understanding the influence of the autopoietic endowments of Works Council members on their proactive participation required in the design and implementation of Industry 4.0 technologies [5]. Our research results also contribute to an understanding of the organizational energy management of Works Council members that they need for a strategic approach to address the challenges of Industry 4.0 [17].

Works Council members need a proactive approach to implementing worker participation to help employees maintain or ensure humane working conditions when integrating Industry 4.0 technologies. Their autopoietic endowments are significant for proactive action. Our research's contribution is in understanding the model of the influence of the autopoietic endowments of Works Council members, the relations between the Works Council members and management, and organizational energy.

For Works Councils to recognize and understand their tasks in the organization, they require training. A German study has shown that Works Councils do not take advantage of their opportunities to participate in training programs. Therefore, their understanding and willingness to work with management will be critical to the effectiveness of Works Councils in the digital transformation process. Further research could make it possible to measure the importance of Works Councils for corporate decision-making and the general relationship between management and Works Councils [18]. This article provides an insight into the types of relationship of Works Councils with management that defines the role of Works Councils in management decision-making in an organization [9].

The results of our research provide managements with insights into the impact of the type of relationship between workers and management on the quality of their orga-

nizational energy. These insights can contribute to their understanding of Works Council members' work in representing the interests of workers in the organization. A better understanding of Works Council members can help management be more focused and promote their education to strengthen the qualities that contribute to constructive relationships and quality energy.

The study examined the impact of the autopoietic endowments of Works Council members on their relationships with management and the impact of the type of relationship between the Works Council and management on organizational energy. Relationships between the Works Council and management and organizational energy are also influenced by other factors that were a limitation but should be explored through further research.

The clarified findings can contribute to a more effective implementation of worker participation in the implementation of Industry 4.0 projects. Learning about digitalization in the workplace and the challenges involved requires clear strategies and the utmost attention to the crucial factors to success. These factors also include worker participation and the level of implementation, which largely depend on the type of relationship between the Works Council and management. This area is a critical but often overlooked aspect in practice, which contributes to improving employees' working lives and the economic performance of organizations.

The described and substantiated model of the influence of the Works Council members' autopoietic endowments on the type of relationship with management, and the autopoietic endowments and type of the Works Council's relationship with management on organizational energy can be a starting point for further research.

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