ABSTRACT

Purpose: It is aimed to evaluate the maturity of the business through the transition to digital transformation with Best-Worst Method.

Methodology: In this maturity assessment the weights of the criteria and sub-criteria will be modelled in accordance with the Multi-Criteria-Decision-Making methodology. In this study, digital transformation process dimensions have been clustered by the experts. In this clustering, the weights of the criteria have been determined by using BWM method. It has been used this method. Because, BWM, in the not-fully-consistent cases with more than three criteria (or alternatives) might bring about multiple optimal solutions. Afterwards, a survey of company employees has been conducted to evaluate the maturity for business. In the model digital transformation criteria were defined for business according to expert opinions. Finally, the maturity of digital transformation of the enterprise has been determined.

Findings: The results of the solution shows that the most important criteria is competence of automation and the least important one is inflexible company structure criterion. Furthermore, the sub-criteria that belong to each main criterion have been listed in themselves.

Conclusion: The study provides a maturity assessment methodology which is an important part of digital transformation process. This is the first maturity assessment study under the BWM in the literature.

Keywords: Maturity assessment, multicriteria decision making, technology firms, BWM.

JEL Codes: O31, M15, C44

1. INTRODUCTION

Digital transformation is a technology-induced change on many levels in the organization that includes both the exploitation of digital technologies to improve existing process, and the exploration of digital innovation, which can potentially transform the business model. Digital transformation is a technology-induced change on many levels in the organization that includes both the exploitation of digital technologies to improve existing process, and the exploration of digital innovation, which can potentially transform the business model. Digital transformation is a technology-induced change on many levels in the organization that includes both the exploitation of digital technologies to improve existing process, and the exploration of digital innovation, which can potentially transform the business model.

A maturity model consists of dimensions and criteria, which describe the areas of action, and maturity stages that indicate the evolution path towards maturity. Maturity models are used in two ways.

✓ Descriptive Functionality; maturity models reveal the dimensions which need to be designed.
✓ Prescriptive Functionality; this model enables companies to define courses of action or capabilities needed to reach the desired stage of maturity.

The study provides a maturity assessment methodology which is an important part of digital transformation process. This is the first maturity assessment study under the BWM in the literature. In this study, company employees were asked questions about how they found their company in the digital transformation process. It is aimed to evaluate the maturity of the business through the transition to digital transformation with Best-Worst Method. In this maturity assessment the weights of the criteria and sub-criteria will be modelled in accordance with the Multi-Criteria-Decision-Making methodology. In this maturity assessment the weights of the criteria and sub-criteria...
will be modelled in accordance with the Multi-Criteria-Decision-Making methodology. In this maturity assessment the weights of the criteria and sub-criteria will be modelled in accordance with the Multi-Criteria-Decision-Making methodology. It has been used this method. Because, BWM, in the not-fully-consistent cases with more than three criteria (or alternatives) might bring about multiple optimal solutions. Afterwards, a survey of company employees has been conducted to evaluate the maturity for business. In the model digital transformation criteria were defined for business according to expert opinions. Finally, the maturity of digital transformation of the enterprise has been determined. The study provides a maturity assessment methodology which is an important part of digital transformation process. This is the first maturity assessment study under the BWM in the literature. In this study, company employees were asked questions about how they found their company in the digital transformation process. The difference of the study is determining the maturity model criteria applied to digital transformation process. It has been determined the weights of the criteria by using Best-Worst method and we reach the maturity assessment of the business for digital transformation. For this purpose, it has been given literature review in the second section. Then, data and methodology section has been given in third section. The last section shows the results of the methodology.

2. LITERATURE REVIEW

In this study the literature review part divided in two part. One is related with application of BWM. The other part is related with digital transformation and maturity assessment. First of all, the best-worst method was introduced by Jafar Rezaei in 2015 (Rezaei, 2015). After that this method was applied to supplier development to supplier segmentation in 2015 (Rezaei, Wang, & Tavasszy, 2015). Then, BWM was extended with a linear model (Rezaei, 2016). (Boakai, 2016) applied this method for the selection of third party logistics provider. (Rezaei, Nispeling, Sarkis, & Tavasszy, 2016) applied for supplier selection life cycle approach integrating traditional and environmental criteria using BWM. (Guo & Zhao, 2017) introduced fuzzy best worst method. (Çakır & Can, 2019) applied to determine the outsource usage preference for tourism sector with ARAS and BWM. (Moslem, Farooq, Ghorbanzadeh, & Blaschke, 2020) combined BWM and AHP for affecting the drive behaviour factors related to road safety. In recent years, more companies have given significant importance to digital transformation. For this purpose this study has been evaluated in the viewpoint of the latest studies. (Donnelly & Morrison, 2018) has defined the importance of passing the digital transformation process and with their study, it has been aimed to enlighten the companies from where they can start for digital transformation. (Parusheva, 2019) handled digitalization and digital transformation construction with its benefits and challenges. (Sayabek, Suieuyayeva, & Utegenova, 2019) has given a roadmap for digitalization process with the scope of digital reality, digital aspiration, digital potential, digital fit and digital integration. (Morakanyane, O’Reilly, Philip, & McAvoy, 2020) defined the success factors in the digital transformation as digital trigger, digital culture, digital vision, digital drivers, digital organization, transformed areas and impacts.

3. DATA AND METHODOLOGY

3.1. Best-Worst Methodology

The Best-worst method is a vector based multi-criteria decision-making method developed by Dr. Jafar Rezaei (Rezaei, 2014). This method can be characterized as a pairwise comparison between a set of criteria. From this set of criteria, the participant chooses one criterion which in his or her opinion is most important (best) and one that is least important (worst). The best-criterion is then compared with the remaining criteria and the same is done for the worst-criterion. The benefits of the Best-worst method, compared to other Multi-criteria decision-making methods are:

✓ BWM requires less comparison data.
✓ It leads to more consistent comparisons, which results in reliable results.
✓ BWM can be combined with other MCDM methods.
✓ BWM is a simple method to perform; comparisons are performed with integer numbers ranging from 1 to 9.

It seems that BWM may be one of the best methods to use when deciding on weights for parameters (Serra, Abdelli, Mokdad, & Hammal, 2017). This is because not only the best and worst criteria are predefined by the users, but also the comparison of the other elements to them. Furthermore, this method is not that hard to understand (average) and the requirement of less data makes this method attractive to use.

3.2. Data

The study was applied to a company operating in the IT sector. Business employees were asked questions through the survey about the stages they carried out during the company’s digital transformation process. In the study 5 expert managers were asked to evaluate the criteria among themselves. It has been analyzed academic publications on digital business transformation as well as existing maturity assessments. Digital Maturity Models have eight dimensions. These dimensions can be ordered among themselves. It has been shown in the parenthesis. Main criteria and sub-criteria have been shown in table 1. And then these criteria have been weighted with respect to the experts’ opinion. After that, the evaluations which were obtained by the experts have been entered to the Solver programme via Excel. It can be shown in table 2.

Table 1: Criteria and Sub-Criteria of Digital Maturity Model

| CRITERIA | SUB-CRITERIA |
|----------|--------------|
| Power of traditional processes (Minimum) | Understanding of digital journey |
| | Suitable interaction model |
| CRITERIA NUMBER= 8 | CRITERION 1 | CRITERION 2 | CRITERION 3 | CRITERION 4 | CRITERION 5 | CRITERION 6 | CRITERION 7 | CRITERION 8 |
|-------------------|------------|------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Names of criteria | Power of traditional processes | Resistance to change | Legacy business model | Competence of automation | Optimization of budget | Relevant knowledge | Inflexible company structure | Security |
| Best criterion by the evaluation of the experts | Competence of automation | | | | | | | |
| Worst criterion by the evaluation of the experts | Inflexible company structure | | | | | | | |
| Best to others | Power of traditional processes | Resistance to change | Legacy business model | Competence of automation | Optimization of budget | Relevant knowledge | Inflexible company structure | Inflexible company structure |
| Competence of automation | 3 | 4 | 5 | 1 | 2 | 2 | 4 | 2 |
| Others to the worst | | | | | | | | Inflexible company structure |
| Power of traditional processes | 2 | | | | | | | |
| Resistance to change | | 3 | | | | | | |
| Legacy business model | | 3 | | | | | | |
| Competence of automation | | 4 | | | | | | |
| Optimization of budget | | 5 | | | | | | |
| Relevant knowledge | | 2 | | | | | | |
| Inflexible company structure | | 1 | | | | | | |
| Security | | | | | | | | 6 |

After Table 2. data has been entered the solver model, it has been solved. Then, the results of the weights were found in Table 3.

| MAIN CRITERIA | WEIGHTS OF THE MAIN CRITERIA |
|---------------|-----------------------------|
| Power of traditional processes | 0.113636364 |
| Resistance to change | 0.085227273 |
| Legacy Business Model | 0.068181818 |
| Competence of automation | 0.255681818 |
| Optimization of budget | 0.170454545 |
With respect to Best-worst method, Ksi parameter was found 0.0791. It has shown that our model is consistent.

4. CONCLUSION

According to this study, it has been conducted survey and with respect to this results. It has been determined the importance of criteria for digital transformation process by applying the Best-Worst Method which is a new technique among the Multi-Criteria Decision Making methods. This study is based on the process of the enterprise while going through the digital transformation process. The criteria and sub-criteria included in this process were evaluated by experts. Then, these criteria were weighted with the Best-Worst method. According to these results, the most important criterion was found competence of automation. This means that if the automation used by a business and its employee is useful and user-friendly, it becomes so easy for the business and its employees to make digitalization. Respectively, the other important criterion is relevant knowledge, power of traditional processes, resistance to change, security, legacy business model and the least important criterion is inflexible company structure. This result shows that some companies are unable to escape from the digitalization process, despite the company policies that are not flexible in the digitization process. At the same time, the second important criterion is budget. The budget issue is an important criterion in terms of the share allocated by the companies to digitalization. Another important criterion is relevant knowledge that includes informing users adequately in the digitalization process. Likewise, if the traditional processes are more dominant in the business and the resistance to change is very difficult, the digitization process will be just as difficult. Another important consequence is that the enterprise's security and legal process is less important at the point of transitioning to digital process. For further studies, it can be tried with another MCDM methods and compared their results. Also this maturity assessment can be implemented another sector except Information technologies. And the model can be extended for this way.

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