

EVALUATION OF THE
CUSTOMER RELATIONSHIP MANAGEMENT(CRM) CONSULTANT
PERFORMANCE BY USING SWARA AND WASPAS METHODS

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ABSTRACT

EVALUATION OF THE CUSTOMER RELATIONSHIP MANAGEMENT(CRM) CONSULTANT PERFORMANCE BY USING SWARA AND WASPAS METHODS

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Customer relationship management (CRM) implementation is a very prior decision for companies to increase customer-related revenue or customer lifecycle. The implementation process involves many problems, therefore, most of the companies would prefer to benefit from the CRM consultant's experience. However, Pries & Stone, 2004 theory have shown that consultancy does not make everything right. At this point, the most significant questions are how can we choose the right CRM consultant and measure their performance? These questions become a crucial decision for both firms and consultant companies. In this thesis, one of the popular Multi-Criteria decision-making (MCDM) methods that is Weighted Aggregates Sum Product Assessment (WASPAS) is used for ranking the performance of Customer Relationship Management (CRM) Consultant. Step-wise Weight Assessment Ratio Analysis (SWARA) method is utilized for finding the weight of criteria. This research aims to create an awareness of the role of CRM consultants and adds the sample application of MCDM in literature for especially CRM consultancy firms.

Keywords: CRM, MCDM, SWARA, WASPAS

ÖZ

SWARA VE WASPAS YÖNTEMLERİ KULLANILARAK MÜŞTERİ İLİŞKİLERİ YÖNETİMİ (MİY) DANIŞMANI PERFORMANS DEĞERLENDİRMESİ

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Müşteri İlişkileri Yönetimi (MİY) entegrasyonu gelirlerin veya müşteri yaşam süresinin artırılması, firmaların öncelikli kararları arasında yer almaktadır. Entegrasyon süreçleri sanıldığı kadar aksine bir çok problem barındırmaktadır. Bu yüzden çoğu firma MİY danışmanlarının tecrübelerinden faydalanmaktadır. Ancak, Pries & Stone, 2004 teorisi ortaya koymaktadır ki danışmanlar her zaman doğruyu yapmamaktadırlar. Bu noktada uygun ve doğru MİY danışmanını seçmek hem şirketler hemde MİY danışmanlık firmaları için önemli bir karardır. Bu tezde son zamanlarda güncel olarak kullanılan Çok Kriterli Karar Verme metodlarından (ÇKKV) biri olan Ağırlıklı toplam modeli(WASPAS) ve Aşamalı Ağırlık Değerlendirme Oranı (SWARA) metodları Müşteri İlişkileri yönetim danışmanı değerlendirilmesi amacıyla kullanılmıştır. Bu çalışma özellikle MİY danışmanlık firmalarına MİY danışmanlarının rolü hakkında farkındalık yaratmak ve literature bu konuda örnek bir ÇKKV uygulaması katma arzusu taşımaktadır.

Anahtar Kelimeler: MİY, ÇKKV, SWARA, WASPAS

To my family, fiancée and friends

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TABLE OF CONTENTS

ABSTRACT	iii
ÖZ	iv
DEDICATION.....	v
ACKNOWLEDGMENTS.....	vi
TABLE OF CONTENTS	vii
LIST OF TABLES.....	ix
LIST OF FIGURES	x
CHAPTER 1	1
1. INTRODUCTION	1
1.1 Customer Relationship Management (CRM).....	1
1.2 Implementation of Customer Relationship Management Projects	7
CHAPTER 2.....	9
2. LITERATURE REVIEW.....	9
CHAPTER 3.....	12
3. APPLICATION OF THE SWARA AND WASPAS METHODS	12
3.1 Decision Criteria.....	13
3.1.1 Communication and Relation Skills	13
3.1.2 Development/Technical Skills	14
3.1.3 Business Analyze Skills	16
3.1.4 Project Management Skills	17
3.2 Computation Procedure of Criteria Weights by SWARA	18
3.2.1 Application of SWARA Method for Criteria.....	19
3.3 Ranking Alternatives by Using WASPAS.....	28
3.3.1 Application of WASPAS	30

3.3.2 Discussion of Results.....	34
CHAPTER 4.....	36
4. CONCLUSION.....	36
REFERENCES.....	37
APPENDICES.....	43
APPENDIX A.....	43
APPENDIX B.....	45

LIST OF TABLES

Table 2-1: Distribution of papers based on application areas (Mardani, et al., 2017)..	9
Table 2-2: Literature Review for CRM Consultant	10
Table 2-3: Literature Review Results for SWARA and WASPAS	11
Table 3-1: Decision Makers	19
Table 3-2: Criteria ranking for decision makers.....	20
Table 3-3: Points between 0 to 1.00	21
Table 3-4: The average for all criteria	22
Table 3-5: sj values	23
Table 3-6: Calculation of Coefficient.	24
Table 3-7: Corrected weights of criteria.	25
Table 3-8: The final criteria weights.....	26
Table 3-9: The relative final weights.....	27
Table 3-10: Alternatives.....	28
Table 3-11: Decision Makers	28
Table 3-12: Scores	30
Table 3-13: Initial Decision Matrix-1	31
Table 3-14: Initial Decision Matrix-2	32
Table 3-15: Normalized decision matrix	32
Table 3-16: Results of WS	32
Table 3-17: Results of WP	33
Table 3-18: Result of the total relative significance	33

LIST OF FIGURES

Figure 1-1: Porter's Value Chain model [3]	2
Figure 1-2:CRM Categorization.....	3
Figure 1-3:The CRM Value Chain [6].....	4
Figure 1-4:Payne and Frow's model of CRM [7].	5
Figure 1-5:Gartner's CRM Model.....	6
Figure 1-6:CRM project design and planning process	8
Figure 1-7:Waterfall methodology	8
Figure 3-1:MCDM architecture of CRM consultants' performance evaluation.....	13
Figure 3-2:Results of the total relative significance	34
Figure 3-3:Comparision of WS and WP Method with Different Coefficients.....	35
Figure 3-4:Comparision of MCDM Results.....	35

CHAPTER 1

1. INTRODUCTION

1.1 Customer Relationship Management (CRM)

Selling action is not a new term for human history even though it was not known as the Customer Relationship Management (CRM) concept until the 1990s. CRM is started with developments in the information and communication systems and Products and services must be more closely aligned to their customer's needs [1]. This close relationship with the customer is called "customer-centric". It is the difference between knowing what products a customer is buying and why he or she is buying them [2]. According to Peppers & Rogers's study about being a "Customer-centric" organization, the best chance to achieve success for companies is to focus on increasing customer value through customer experiences and relationships.

Companies can find the best ways to determine the demands of the existing or target customers whether their entrepreneurs or multinational organizations Sales process has become a new challenge for companies in today's competitive environment. Sales and marketing are the most significant steps when thinking about Porter's value chain in Figure 1-1.

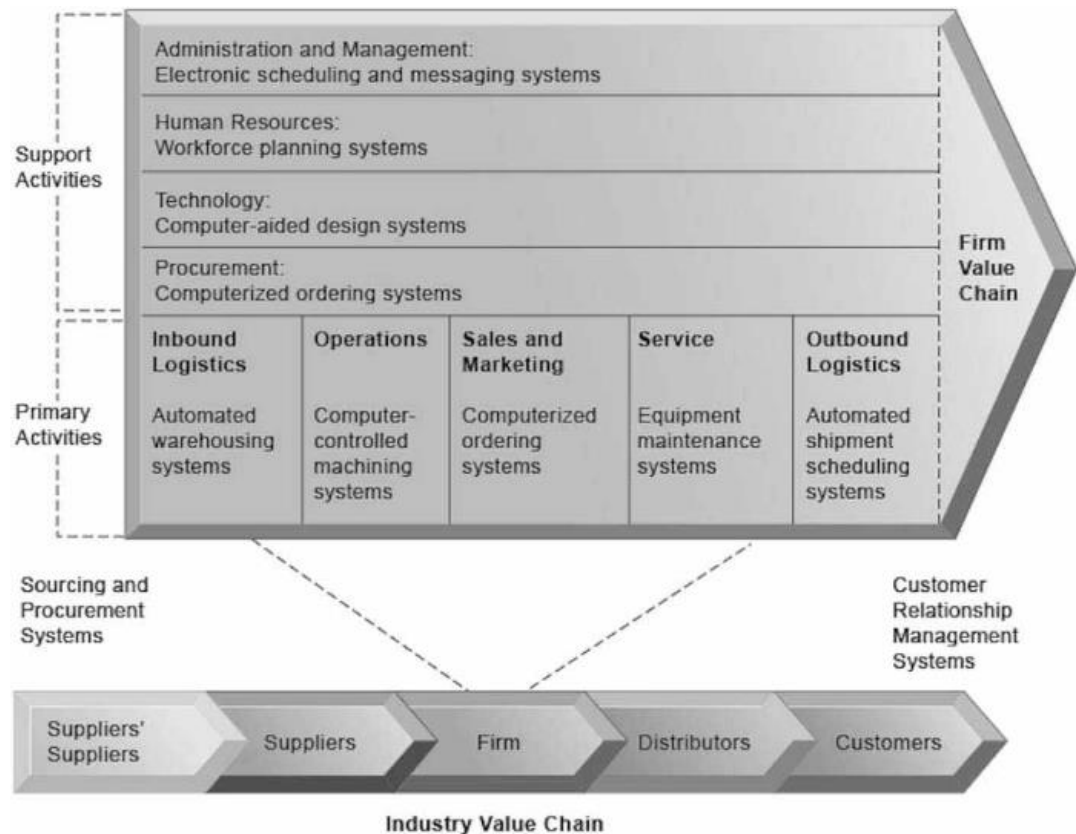


Figure 1-1: Porter's Value Chain model [3]

Firms are instead strategized on how to gain a sustainable competitive advantage from the information they gather about customers [4]. First CRM products are started to develop during this period and now there is a range of CRM solutions such as Microsoft Dynamics CRM, SAP CRM, Oracle CRM, Salesforce CRM, etc. According to some executives, customer relationship management is a software solution or database. These kinds of IT solutions are required for CRM implementations. However, CRM cannot be seen as only an IT product, marketing process, or database. Building customer value does not begin with installing technology [4].

CRM is the core business strategy that integrates the internal process and functions, and external networks to create and deliver value to targeted customers at a profit [5]. CRM has been defined by CRM sector leaders and some of them can be seen in APPENDIX A.

CRM has been identified in different types as an opinion. By using the Kinnett, 2017 CRM categorization shown in Figure 1-2. Strategic CRM focuses on winning and

keeping customers by creating and delivering value better than competitors [5]. Operational CRM can be explained with examples such that creating and publishing campaigns, following and answering customer complaints, incidents, or tracking the opportunities, quotes, and orders. Analytical CRM is storing and processing data from operations related to the customer such as the survey results, the rate of the quotes returns to order, etc. Operational, Analytical, and Collaborative CRM have integrated each other. Operational CRM struggles to reach full effectiveness without analytical information about customers [5]. Collaborative CRM is the separation of the enterprises into the supply chain such as using customer portal, vendor portal, etc. Social CRM can be seen as another main type of CRM. Social CRM is the description of capturing and identifying the data from Social media such as LinkedIn, Twitter, Facebook, etc. Companies can capture comments about their companies or follow targeted customer trends by integrated with Social CRM tools.



Figure 1-2:CRM Categorization

CRM Models must be determined for better understanding the CRM. Four of the CRM Model is introduced into the number of comprehensive CRM models.

- The IDIC Model:

The IDIC model was developed by Peppers and Rogers. According to the IDIC model, the company must identify customers, differentiate them, interact with them, and customize some aspects of its behaviors toward them [4]. Identify the customer who is the target and existing customer. Differentiate the customers in which one can increase the revenue now or in the future. Interact with customers to improve and understand the relations. Customize the service, relations.etc. must be met with the customer.

- Buttle’s CRM Value Chain Model:

The CRM model was developed by Francis Buttle [5] that shown in Figure 1-3. Model consists of primary stages and supporting conditions. Primary stages create profitable customers that ensure the five core stages. Customer Portfolio Analysis can be defined that customers should be considered in their features, needs, expectations, and cost profiles. The customer lifecycle defined as three major activities that are acquiring, retaining customers, and developing customer value.

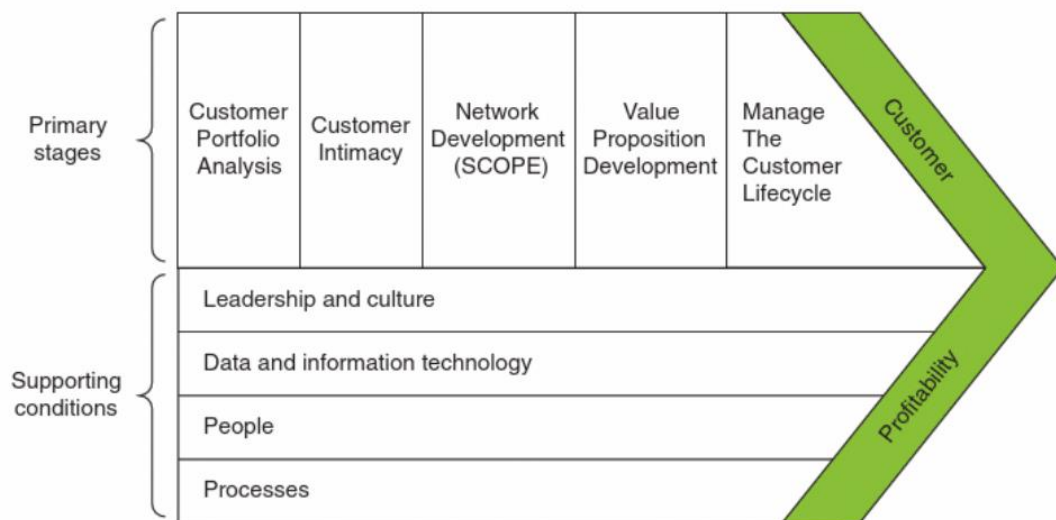


Figure 1-3: The CRM Value Chain [6].

- Paynes' Five Process Model:

The model was developed by Adrian Payne [7]. This model (Figure 1-4) consists of the five main processes in CRM. The strategy development process focuses on defining the current company situation, goals and parameters, defining the target and existing customer, and the importance of segmentation. The value creation process can be defined as delivering value to the customer and increasing the lifetime value of the customers. The multi-channel integration process focusses on the best way to communicate with customers and an easy way to customers communicate with the company. The information management process can be defined as the collection of the customer-related data and using this information for improving CRM actions. The performance assessment process is the final process for ensuring the goals defined in the Strategic development process.

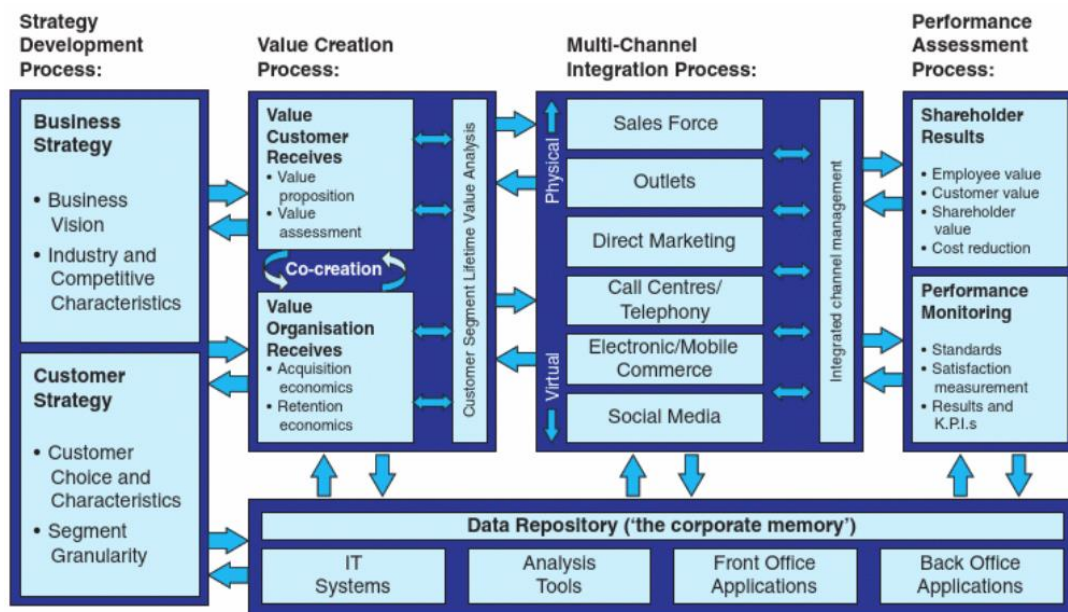


Figure 1-4:Payne and Frow's model of CRM [7].

- The Gartner Competency Model:

The model was developed by Gartner Inc. that one of the IT research and advisory company. The model consists of the eight main stages that are shown in Figure 1-5. CRM visions, CRM strategy that includes objectives, segments, and managing the resource more efficiently. Valued customer experience is understanding the customer requirements, agile solutions for Customer feedbacks. Organizational collaboration can be defined as organizational behavior that must be transformed into customer-centric. CRM processes consist of the customer life cycle, account analysis, and application of knowledge management. CRM information involves gathering data which should be valuable customer data. CRM technology must be involved in effective technologies. CRM metrics can be defined as measurements of success and failures.

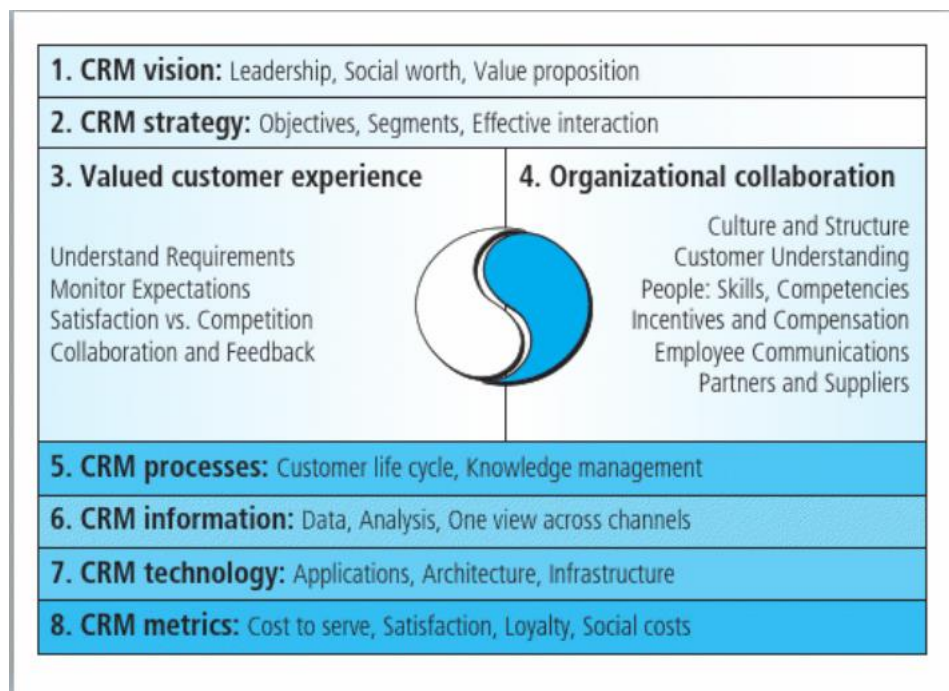


Figure 1-5:Gartner's CRM Model

1.2 Implementation of Customer Relationship Management Projects

In the previous title, CRM is introduced, and CRM models are examined. CRM project implementation will be examined through into title. CRM projects mostly involve CRM software and hardware implementations, people, and processes.

CRM implementation steps can be defined in five major phases and shown in Figure 1-6 [5]. Develop the CRM strategy consist of the Analysis, defining goals, and objectives. CRM project foundation can be defined as identify stakeholders and project management needs. CRM projects mostly involve the following partners.

- Companies that will use the CRM
- Vendors of CRM that supported CRM software license such as Microsoft, SAP, Oracle...Etc..
- CRM Consultant that support service for implementing CRM. Some of the thoughts about CRM consultant objectives are the following.
 - Advice companies to create and developed profitable customer relationships.
 - Building superior brand value [8].
 - Foster greater customer satisfaction and loyalty [8].
 - Figure out how that fits into your current technology environment into Current data, Overall process and Operating model environment [9].

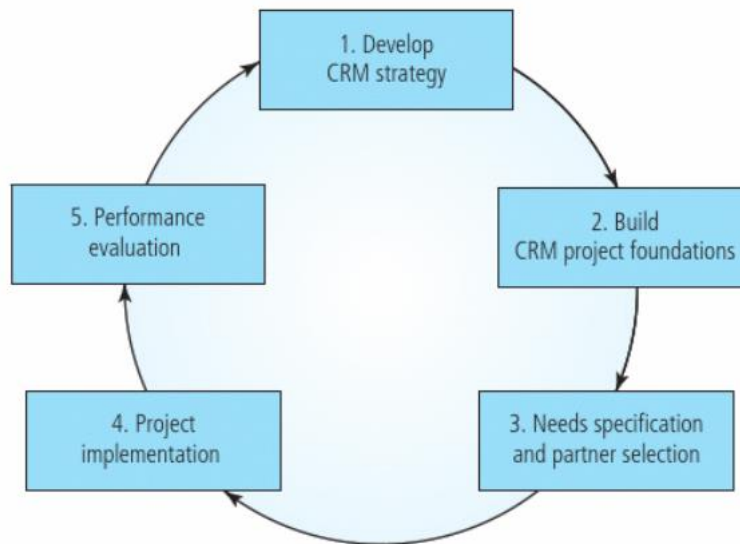


Figure 1-6:CRM project design and planning process

Project implementation consists of several methodologies such as Waterfall methodology, scrum methodology, Iterative development methodology..etc. The waterfall methodology (Figure 1-7) is one of the common CRM implementation methodologies. Implementation steps are sequence and the next step should not be started before the previous step is ended.

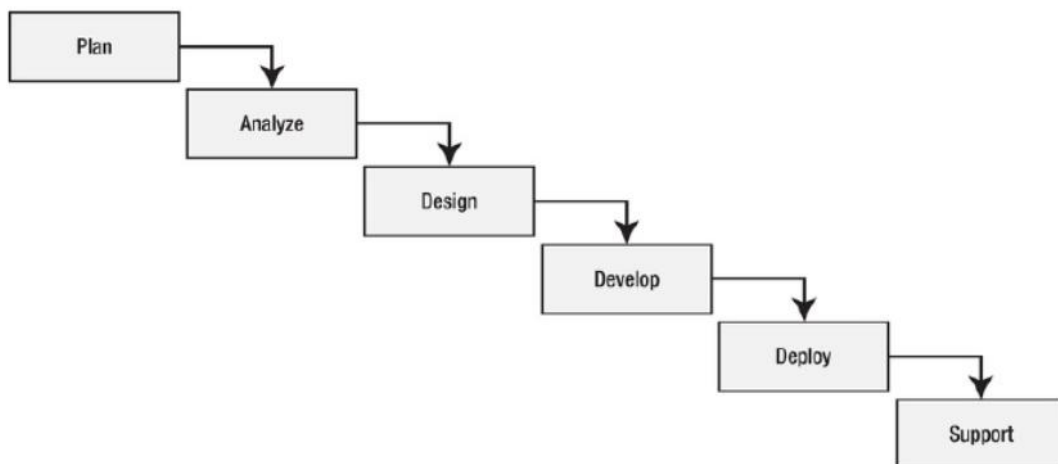


Figure 1-7:Waterfall methodology

The last stage of the CRM project is Performance Evaluation. There are some constraints such as budget and time. The project must be ended on time and the budget should not be exceeded.

CHAPTER 2

2. LITERATURE REVIEW

The MCDM methods have been determining for a long period and hundreds of papers have been published up to now. The literature review process has been planned into two perspectives that evaluation of the methods used for decision making by SWARA and WASPAS method was privileged. Secondly, the literature review was conducted for CRM consultant evaluations with MCDM. Mardani, et al., 2017 study that systematically reviewed about SWARA and WASPAS is utilized for our literature review.

SWARA and WASPAS as a hybrid MCDM approach have been evaluated in many areas and most commonly used studies are shown in Table 2-1. In conjunction with this perspective, papers are published to intensify into Construction and Manufacturing areas that have fewer studies related to the evaluation of the human resource.

Table 2-1: Distribution of papers based on application areas (Mardani, et al., 2017)

Application Fields	Number of Papers	Percentage
Construction Management	22	40%
Manufacturing and Operation managemnet	14	25,45%
Computing and Operation resarch	7	12,73%
Sustaniable and Reneweable energy	5	9,09%
Human Resource Management	4	7,27%
Other Areas	3	5,45%
Total	55	100%

There are Few studies about CRM Consultants and these two of them are considerable that shown in Table 2-2. This situation also shows us that this paper will be an important resource for CRM consultants and also creating awareness to focus on more studies about CRM Consultants.

Table 2-2: Literature Review for CRM Consultant

<i>Authors</i>	<i>Title</i>
(Pries & Stone, 2004)	Managing CRM Implementation with Consultant-CRM or Change management
(McKay, 2008)	The New Breed of CRM Consultant

Papers about integrating the SWARA and WASPAS methods are evaluated for our research and shown in Table 2-3. Detailed information for each paper is also determined and shown in APPENDIX B.

In the literature, there is no model to consider the CRM Consultant performance by using the integration of SWARA and WASPAS. The comparable studies may consider as Stanujkic, 2017 study that SWARA and ARCAS integration is used as a case study for salesperson selection and SWARA and WASPAS integration for personnel selection in the tourism industry by Stanujkic, 2017.

Table 2-3: Literature Review Results for SWARA and WASPAS

<i>Authors</i>	<i>Research Objective</i>	<i>Methods</i>
(Zolfani, Aghdaie, Derakhti, Zavadskas, & Varzandeh, 2013)	Using SWARA and WASPAS for selection the shopping mall location	SWARA and WASPAS
(ZOLFANI, MAKNOON, & ZAVADSKAS, 2014)	Evaluating the strategies of Nash Equilibriums by using SWARA and WASPAS	SWARA and WASPAS
(Vafaeipour , Zolfani, Varzandeh, Derakhti, & Eshkalag, 2014)	Using SWARA and WASPAS for selection the site for wind energy	SWARA and WASPAS
(Nezhad, Hashemkhani Zolfani, Moztarzadeh, & Zavadskas, 2015)	Evaluating and ranking high technology selection by using SWARA	SWARA and WASPAS
(UROSEVIC, KARABASEVIC, STANUJKIC., & MAKSIMOVIC, 2017)	Using SWARA and WASPAS for personal selection	SWARA and WASPAS
(Mardani, et al., 2017)	Overview of the theory and applications of WASPAS and SWARA.	PRISMA
(Adalı and Işık 2017)	Using SWARA and WASPAS for evaluation of the suppliers	SWARA and WASPAS
(Yurdođlu & Kurfakçı, 2017)	Using SWARA and WASPAS for deciding the Server	SWARA and WASPAS
(Khodadadi, et al, 2017)	Using SWARA and WASPAS for evaluation of advance oxidation processes(AOPs)	SWARA and WASPAS
(Çađıl, et al. 2018)	Using SWARA and WASPAS for evaluation of the suppliers	SWARA and WASPAS
(Çakır, Akel, & Dođaner, 2018)	Using SWARA and WASPAS for evaluation of the private shopping sites.	SWARA and WASPAS
(Sremac, Stević, Pamučar, Arsić, & Matić, 2018)	Using SWARA and WASPAS for evaluation of the third-part logfistics firms	SWARA and WASPAS
(Safari, et al,2018)	Using SWARA and WASPAS for evaluation of gas transmissions	SWARA and WASPAS
(Prajapati, Kant, & Shankar, 2019)	Identify and prioritize the solution by using SWARA and WASPAS	SWARA and WASPAS
Yucenur, Subasi, 2019	Using SWARA and WASPAS for evaluation of the city for launching ramp	SWARA and WASPAS
(İpekçi, 2019)	Using SWARA and WASPAS for evaluation place for energy plant	SWARA and WASPAS
(Bausys, Cavallaro, & Semenas, 2019)	Weighted Aggregated Sum Product Assessment—Single-Valued Neutrosophic Sets(WASPAS-SVNS) applied for performance of the autonomomous agents	SWARA and WASPAS-SVNS

CHAPTER 3

3. APPLICATION OF THE SWARA AND WASPAS METHODS

SWARA and WASPAS integration was performed to evaluate CRM consultants' performance. The criteria weights were computed using SWARA. Consultants were ranked by implementing WASPAS.

The SWARA method is recommended as more effective in many cases [10]. The calculation algorithm of this method is very simple and very close to the common human's thinking [11]. Criteria can be chosen with different types such as quantitative and qualitative which calculation steps can combine these two criteria types by Normalization. SWARA method needs lower pairwise comparison than Analytic Hierarchy Process(AHP) or Fuzzy AHP and consistency check isn't necessary because of criteria are ordered descendingly. WASPAS method is much simpler to apply, if compared with the well-known The Preference Ranking Organization Method for Enrichment Evaluation(PROMETHEE), Technique for Order Preference by Similarity to Ideal Solution(TOPSIS) and Vise Kriterijumska Optimizacija I Kompromisno Resenje(VIKOR) methods [10]. WASPAS approach is the integration of Weighted Product Model(WPM) and Weighted Sum Model(WSM) and accuracy for WASPAS is strength than WPM and WSM [12].

3.1 Decision Criteria

Considered criteria are determined to depend on the sector leaders. These criteria form the expectations of sector leaders from CRM consultants. The main architecture of the MCDM model is presented in Figure 3-1.

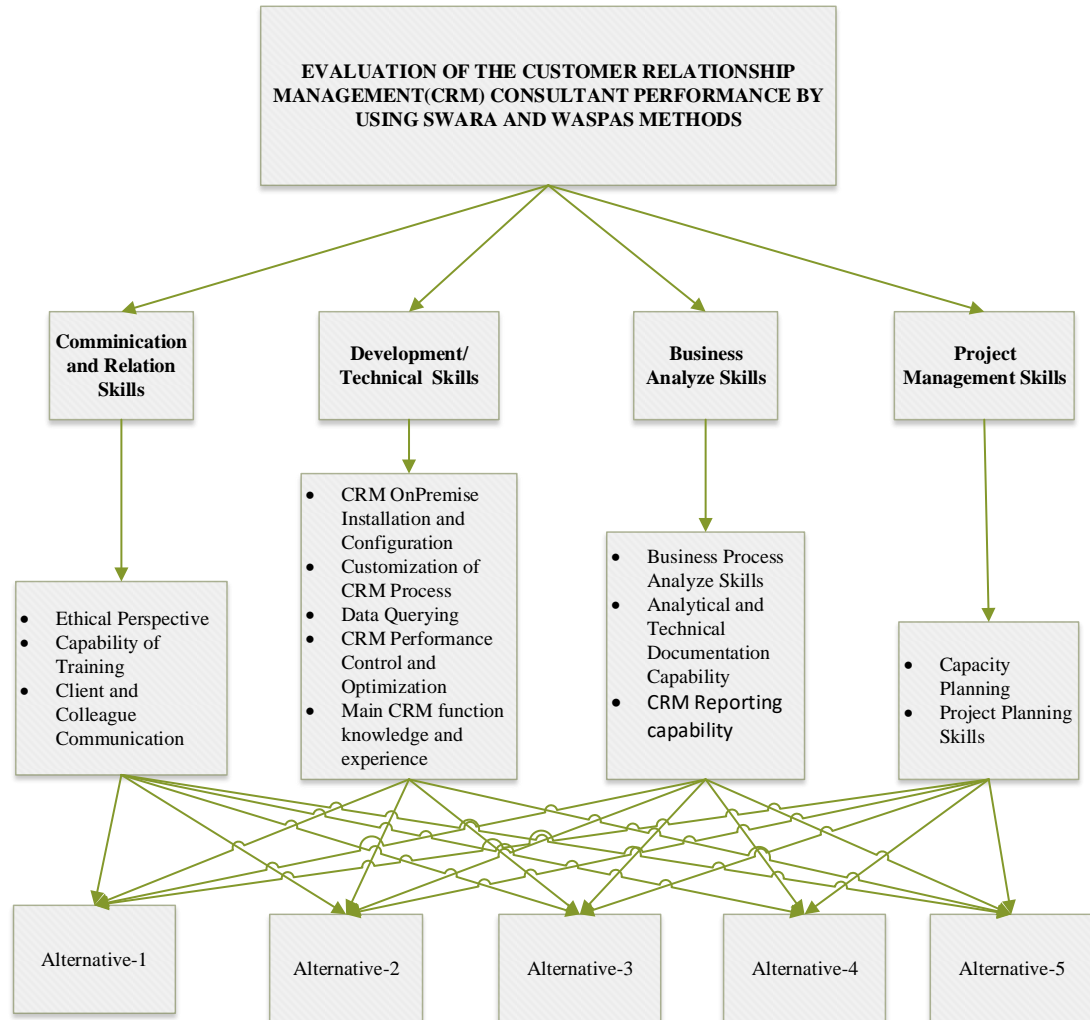


Figure 3-1: MCDM architecture of CRM consultants' performance evaluation.

3.1.1 Communication and Relation Skills

CRM Consultants have an important position in the CRM implementation projects that always communicate with the development team and also must build strong relationships with clients. This is an important issue that must be determined as criteria.

3.1.1.1 Ethical Perspective

As a business professional, you have a responsibility to promote ethical uses of information technology in the workplace [13]. Ethics is an important issue for CRM consultants that they have accessibility to the client's information and customer data. CRM consultants also work as a data scientist using customer data for Analytical CRM. Analytical CRM mines customer-related data for strategic or tactical purposes [5]. It's the junction between ethical ideals and practice. It's doing good data science [14]. Using the data for client benefit is crucial. Data is valuable and consultants can access personal records of customers and client-specific strategical analysis results within the CRM. At this point, the consultant must support the confidence not to use customer the data for its benefits.

3.1.1.2 Capability of Training

Training is a part of any technology implementation [15] and CRM consultants are responsible for explaining the CRM system to the end-users. A significant component of the initial CRM implementation project is user training [15]. This is an important step that will break user resistance.

3.1.1.3 Client and Colleague Communication Skills

One of the most common failures of CRM projects is missing internal and external communication [16]. Communication is important so that people know what to expect, which helps them prepare for coming changes [15]. Before starting on any CRM project, companies must first ask what kind of relationships they want to build with their clients [17]. The critical importance of creating and maintaining an effective consultant-client relationship [18].

3.1.2 Development/Technical Skills

CRM application consists of software and hardware. CRM Consultants must have knowledge about software development for customizing and creating solutions for clients.

3.1.2.1 CRM On-premise Installation and Configuration

Nowadays, online access applications are started to be more common and for the CRM side, these kinds of applications are called CRM online applications. CRM Online

applications store software and data in the cloud environment while on-premise CRM applications store data and application software within the local company servers. Consultants are responsible for the installation of the CRM program into the server that IT department assist the consulting team with network and server access, and potentially do some development and testing work [1]. Most of the CRM vendors do not support on-premise systems in new updated versions. Installation and configuration of the software into the server will not be necessary for CRM consultants in the future.

3.1.2.2 Customization of the CRM Process

Customization in information systems can be understood as a special type of co-creation of value and late product differentiation [19]. This is the question of how we can extend the system to fit new business requirements [20]. CRM Consultants work with client organizations through an implementation process to identify how CRM will be used to support the business. CRM consultants could adapt to entities, fields, or business rules without changing the code of the software. Configuration decisions should be based on the processes and business needs. Defining where the CRM process stops and where other processes start can be a challenge [21]. One of the key skills of CRM administrators is the developing functional specifications for software applications and they are the central figure in maintaining and modifying the CRM [1].

3.1.2.3 Data Querying/Coding

At least one of the querying methods such as SQL, Python, R..etc. and software knowledge such as .Net, Java, JavaScript, etc. must be known by CRM consultants according to requirement lists into the Human resource centers. The best consultants have technical skills and judgment to choose a proper balance, and the personal confidence to use and sell a simple or complex technique when the selected approach is right for the circumstances [22].

3.1.2.4 CRM Performance Control and Optimization

CRM consultants must be capable to plan the requirements of software for on-premise systems that CRM applications store data and application software within the local company servers. Software performance mostly related to data usage and hardware capacity. CRM consultants have crucial responsibilities at this point that deciding suitable integrations tools, applications, and hardware. Poorly designed and

implemented software will not run fast on fast hardware [23]. At this point, the CRM consultant anticipates the right hardware capacity planning and suitable applications while CRM implementation projects.

3.1.2.5 Main CRM Function Knowledge and Experience

CRM application frameworks can be differentiating according to software development companies, but CRM's main functions such as opportunity, quote, order, service management, marketing tools are most common. One of the key skills of CRM business analysts is a deep understanding of the business processes supported by your CRM applications [15].

3.1.3 Business Analyze Skills

The first step of the CRM implementation projects is understanding what clients exactly need, so Analyzing steps is important for answering this question.

3.1.3.1 Business Process Analyze Skills

Consulting skills require the ability to collect and analyze information [24]. Consultants analyze three levels which are Situation Analysis, Problem Analysis, and Solution Analysis [25]. According to Pries & Stone, 2004 study that Analysis of the current situation of the company is the second step of consultants are applied commonly.

3.1.3.2 Analytical and Technical Documentation Capability

Exhaustive documentation of the project development, especially the most important milestones [26]. CRM implementation project mostly takes long periods and during the implementation period team member may change or project may slow down some reasons such as financial or management problems. Documentation is crucial steps for all CRM implementation projects and Analytical documentation that the situation of the client beginning of the project which must approve by the client and the technical document is also necessary for a clear explanation of software development steps during the implementation.

3.1.3.3 CRM Reporting Capability

Reporting is a very important piece of any system that is heavily used by managers or upper management roles [27]. Reports have been prepared by different types such as

SQL Reporting, Crystal Reports, ASP.NET or Silverlight, etc. Deep querying knowledge must be necessary for developing reports with this kind of reporting tools and CRM consultants must be capable of CRM reporting. Nowadays, new reporting tools are started to use such as Power BI, SAP BI, etc. These kinds of reporting tools are more easy tools which Clients can be prepared after short training.

3.1.4 Project Management Skills

CRM implementation must be handled as a project that has participants, time, and budget constraints. Steps must be planned for all sides and manage this plan in the discipline for the success of the CRM implementation.

3.1.4.1 Capacity Planning

Consultants are responsible for pre-sales activities which can be explained as initial client meetings for understanding the client's challenges, business models, and requirements. At this stage, consultants need to prepare objectives, timescales, and technical requirements. They should also specify clearly which resources they are devoting to the project, including the number of people who will work on the project team and the number of hours they will provide [25]. If a consultant overestimates the specific process of a project, the relationship between the consultant and the customer will be affected negatively. On the other side, if the estimation is lower than the reality, it will also have a negative impact on the consultant-customer relationship. Requesting an additional payment from the customer caused by misleading estimation ends up with a poor reputation in the market.

3.1.4.2 Project Planning Skills

One of the ways of consultants can help companies implementing CRM is developing implementation plans and project management [6]. At this point, project management skill is important for organizations. Project management skills provided by consultants help provide comfort to senior managers [24]. Project Management is an important subject for all sides of the CRM project that not only for the Consultant. Without a clear understanding of the value network existing between all CRM players, no CRM project can be successfully implemented, even if the best CRM System has been acquired [17]. CRM consultants work as project leaders with project managers. One of the key skills must be strong project management skills [1].

3.2 Computation Procedure of Criteria Weights by SWARA

The Step-wise Weight Assessment Ratio Analysis (SWARA) was first advanced by Kersuline, 2010. The SWARA method is preferred instead of AHP, FUZZY AHP because of consistent less pairwise comparisons. For this reason, criteria weights were computed by SWARA in this study.

The steps of SWARA for computing the criteria weights are shown below based on Kersuline, 2010.

Step-1: Sorting the evaluated criteria in descending order.

Iteration-1.1: Decision makers should sort the criteria for their perspective to preparing the next iteration for better determination.

Iteration-1.2: Decision makers must determine the most important criteria for their perspective and priority. The most important criteria is given 1.00 points. Decision makers must assign the points to other criteria by considering the most importance of criteria which is 1.00 and points must be divided 0.05.

Step-2: Calculation of Comparative importance of an average value [28].

The relative importance of criterion j according to the $j-1$ criterion is determined started from the second criterion. Calculated ratio is called Comparative Importance of an Average Value [28] that show as s_j .

Iteration-2.1: Calculation of the average for all criteria by using Eq-1 that used for finding the average value of relative importance assigned to the criteria.

$$\bar{p}_j = \frac{\sum_{k=1}^l p_j^k}{l} \quad j=1, 2, \dots, n \quad (\text{Eq-1})$$

l : Number of decision makers

Iteration-2.2: Calculation of the s_j .

All criteria are ranking to highest to lower value according to their relative average importance scores and compared. As a result of this comparison, the comparative significance s_j values of the average value are calculated.

Step-3: Determination of coefficient donated c_j

$$c_j = s_j + 1 \quad (\text{Eq-2})$$

Step-4: Calculation of the Recalculated weights as shown s'_j .

$$s'_j = \frac{s'_{j-1}}{c_j}, s_{j-1} > s_j \quad (\text{Eq-3})$$

Step-5: Final criteria weights (w_j) for all criteria are calculated using Eq-4.

$$w_j = \frac{s'_j}{\sum_{j=1}^n s'_j} \quad j=1,2..n \text{ that } n: \text{ Number of Criteria.} \quad (\text{Eq-4})$$

3.2.1 Application of SWARA Method for Criteria

Step-1: Sorting the evaluated criteria in descending order

Iteration-1.1: Decision makers have decided that their most important criteria their perspectives and experiences. Information about decision-makers is shown in Table 3-1. Criteria are ordered according to decision-makers' opinions. These sorting for each decision-maker are shown in Table 3-2.

Table 3-1: Decision Makers

	Position	Experience(Year)
DM1	Manager	25
DM2	Asistant Manager	16
DM3	Team Leader	14

Table 3-2:Criteria ranking for decision makers.

		Decision Makers		
		DM1	DM2	DM3
1	Communication and Relation Skills	4	3	1
2	Development/Technical Skills	1	1	3
3	Business Analyze Skills	2	4	2
4	Project Management Skills	3	2	4

		Decision Makers		
		DM1	DM2	DM3
1	Communication and Relation Skills			
1.1	Ethical Perspective	2	2	1
1.2	Capability of Training	3	1	3
1.3	Client and Colleague Communication	1	3	2

		Decision Makers		
		DM1	DM2	DM3
2	Development/Technical Skills			
2.1	CRM OnPremise Installation and Configuration	2	1	3
2.2	Customization of CRM Process	3	2	5
2.3	Data Querying	1	3	4
2.4	CRM Performance Control and Optimization	5	5	2
2.5	Main CRM function knowledge and experience	4	4	1

		Decision Makers		
		DM1	DM2	DM3
3	Business Analyze Skills			
3.1	Business Process Analyze Skills	3	3	2
3.2	Analytical and Technical Documentation Capability	1	2	1
3.3	CRM Reporting capability	2	1	3

		Decision Makers		
		DM1	DM2	DM3
4	Project Management Skills			
4.1	Capacity Planing	2	1	1
4.2	Project Planning Skills	1	2	2

Iteration 1.2: Decision makers evaluate the criteria. The most important criteria is 1.00 and the rest of the points are assigned between 0 to 1.00 that points are must be divided into 0.05. Calculation results are shown in Table 3-3.

Table 3-3: Points between 0 to 1.00

		Decision Makers		
		DM1	DM2	DM3
1	Communication and Relation Skills	0.4	0.7	1
2	Development/Technical Skills	1	1	0.6
3	Business Analyze Skills	0.7	0.6	0.75
4	Project Management Skills	0.5	0.9	0.5

		Decision Makers		
		DM1	DM2	DM3
1	Communication and Relation Skills			
1.1	Ethical Perspective	0.6	0.9	1
1.2	Capability of Training	0.5	1	0.4
1.3	Client and Colleague Communication	1	0.8	0.6

		Decision Makers		
		DM1	DM2	DM3
2	Development/Technical Skills			
2.1	CRM OnPremise Installation and Configuration	0.8	1	0.5
2.2	Customization of CRM Process	0.7	0.8	0.4
2.3	Data Querying	1	0.8	0.45
2.4	CRM Performance Control and Optimization	0.6	0.6	0.55
2.5	Main CRM function knowledge and experience	0.65	0.7	1

		Decision Makers		
		DM1	DM2	DM3
3	Business Analyze Skills			
3.1	Business Process Analyze Skills	0.6	0.7	0.95
3.2	Analytical and Technical Documentation Capability	1	0.8	1
3.3	CRM Reporting capability	0.7	1	0.6

		Decision Makers		
		DM1	DM2	DM3
4	Project Management Skills			
4.1	Capacity Planing	0.9	1	1
4.2	Project Planning Skills	1	0.8	0.95

Step-2: Calculation of p_j .

Iteration-2.1

Equation (1) is used for determining the average value for all criteria p_j .

p_j values are depicted in Table 3-4.

$$\bar{p}_j = \frac{\sum_{k=1}^l p_j^k}{l} \quad j=1, 2, \dots, n \quad (\text{Eq-1})$$

l : Number of decision makers

Table 3-4: The average for all criteria

		Decision Makers			$\bar{P}_j = \frac{\sum_{k=1}^l P_j^k}{l}, j = 1, 2, \dots, n$
		DM1	DM2	DM3	
1	Communication and Relation Skills	0.4	0.7	1	0.700
2	Development/Technical Skills	1	1	0.6	0.867
3	Business Analyze Skills	0.7	0.6	0.75	0.683
4	Project Management Skills	0.5	0.9	0.5	0.633
Decision Makers					
1	Communication and Relation Skills	DM1	DM2	DM3	
1.1	Ethical Perspective	0.6	0.9	1	0.833
1.2	Capability of Training	0.5	1	0.4	0.633
1.3	Client and Colleague Communication	1	0.8	0.6	0.800
Decision Makers					
2	Development/Technical Skills	DM1	DM2	DM3	
2.1	CRM OnPremise Installation and Configuration	0.8	1	0.5	0.767
2.2	Customization of CRM Process	0.7	0.8	0.4	0.633
2.3	Data Querying	1	0.8	0.45	0.750
2.4	CRM Performance Control and Optimization	0.6	0.6	0.55	0.583
2.5	Main CRM function knowledge and experience	0.65	0.7	1	0.783
Decision Makers					
3	Business Analyze Skills	DM1	DM2	DM3	
3.1	Business Process Analyze Skills	0.6	0.7	0.95	0.750
3.2	Analytical and Technical Documentation Capability	1	0.8	1	0.933
3.3	CRM Reporting capability	0.7	1	0.6	0.767
Decision Makers					
4	Project Management Skills	DM1	DM2	DM3	
4.1	Capacity Planing	0.9	1	1	0.967
4.2	Project Planning Skills	1	0.8	0.95	0.917

Iteration-2.2

All criteria are ranking to highest to lower value according to their relative average importance scores and compared. As a result of this comparison, the comparative significance s_j values of the average value are calculated and shown in Table 3-5.

Table 3-5: s_j values

		$\bar{P}_j = \frac{\sum_{k=1}^l P_j^k}{l}, j = 1, 2, \dots, n$	s_j
2	Development/Technical Skills	0.867	1.000
1	Communication and Relation Skills	0.700	0.167
3	Business Analyze Skills	0.683	0.017
4	Project Management Skills	0.633	0.050
<hr/>			
1	Communication and Relation Skills		
1.1	Ethical Perspective	0.833	1.000
1.3	Client and Colleague Communication	0.800	0.033
1.2	Capability of Training	0.633	0.167
<hr/>			
2	Development/Technical Skills		
2.5	Main CRM function knowledge and experience	0.783	1.000
2.1	CRM OnPremise Installation and Configuration	0.767	0.017
2.3	Data Querying	0.750	0.017
2.2	Customization of CRM Process	0.633	0.117
2.4	CRM Performance Control and Optimization	0.583	0.050
<hr/>			
3	Business Analyze Skills		
3.2	Analytical and Technical Documentation Capability	0.933	1.000
3.3	CRM Reporting capability	0.767	0.167
3.1	Business Process Analyze Skills	0.750	0.017
<hr/>			
4	Project Management Skills		
4.1	Capacity Planing	0.967	1.000
4.2	Project Planning Skills	0.917	0.050

Step-3: Calculation of Coefficient:

For all criteria, the coefficient value c_j is calculated by Eq-2. The greatest s_j value is

1. Calculation results are shown in Table 3-6.

$$c_j = s_j + 1 \quad (\text{Eq-2})$$

Table 3-6: Calculation of Coefficient.

		s_j	$c_j = s_j + 1$
2	Development/Technical Skills	1.000	1.000
1	Communication and Relation Skills	0.167	1.167
3	Business Analyze Skills	0.017	1.017
4	Project Management Skills	0.050	1.050
<hr/>			
1	Communication and Relation Skills		
1.1	Ethical Perspective	1.000	1.000
1.3	Client and Colleague Communication	0.033	1.033
1.2	Capability of Training	0.167	1.167
<hr/>			
2	Development/Technical Skills		
2.5	Main CRM function knowledge and experience	1.000	1.000
2.1	CRM OnPremise Installation and Configuration	0.017	1.017
2.3	Data Querying	0.017	1.017
2.2	Customization of CRM Process	0.117	1.117
2.4	CRM Performance Control and Optimization	0.050	1.050
<hr/>			
3	Business Analyze Skills		
3.2	Analytical and Technical Documentation Capability	1.000	1.000
3.3	CRM Reporting capability	0.167	1.167
3.1	Business Process Analyze Skills	0.017	1.017
<hr/>			
4	Project Management Skills		
4.1	Capacity Planing	1.000	1.000
4.2	Project Planning Skills	0.050	1.050

Step-4: Compute the corrected weights of criteria

Corrected weights (S'_j) are calculated for all criteria using Eq-3.

The first rank is $S'_j = 1$. Recalculated weights are shown in Table 3-7.

$$s'_j = \frac{s'_{j-1}}{c_j}, \quad s_{j-1} > s_j \quad (\text{Eq-3})$$

Table 3-7: Corrected weights of criteria.

		$c_j = s_j + 1$	$s'_j = \frac{s'_j - 1}{c_j}$
2	Development/Technical Skills	1.000	1.000
1	Communication and Relation Skills	1.167	0.857
3	Business Analyze Skills	1.017	0.843
4	Project Management Skills	1.050	0.803
<hr/>			
1	Communication and Relation Skills		
1.1	Ethical Perspective	1.000	1.000
1.3	Client and Colleague Communication	1.033	0.968
1.2	Capability of Training	1.167	0.829
<hr/>			
2	Development/Technical Skills		
2.5	Main CRM function knowledge and experience	1.000	1.000
2.1	CRM OnPremise Installation and Configuration	1.017	0.984
2.3	Data Querying	1.017	0.967
2.2	Customization of CRM Process	1.117	0.866
2.4	CRM Performance Control and Optimization	1.050	0.825
<hr/>			
3	Business Analyze Skills		
3.2	Analytical and Technical Documentation Capability	1.000	1.000
3.3	CRM Reporting capability	1.167	0.857
3.1	Business Process Analyze Skills	1.017	0.843
<hr/>			
4	Project Management Skills		
4.1	Capacity Planing	1.000	1.000
4.2	Project Planning Skills	1.050	0.952

Step-5: Compute the final criteria weights

Final criteria weights (w_j) for all criteria are calculated using Eq-4. Calculation results for criteria are shown in Table 3-8.

$$w_j = \frac{s'_j}{\sum_{j=1}^n s'_j} \quad j=1, 2, \dots, n \quad (\text{Eq-4})$$

Table 3-8: The final criteria weights

		$s'_j = \frac{s'_{j-1}}{c_j}$	$w_j = \frac{s'_j}{\sum_{j=1}^n s'_j}$
2	Development/Technical Skills	1.000	0.285
1	Communication and Relation Skills	0.857	0.245
3	Business Analyze Skills	0.843	0.241
4	Project Management Skills	0.803	0.229
		3.577	
1	Communication and Relation Skills		
1.1	Ethical Perspective	1.000	0.357
1.3	Client and Colleague Communication	0.968	0.346
1.2	Capability of Training	0.829	0.297
		2.797	
2	Development/Technical Skills		
2.5	Main CRM function knowledge and experience	1.000	0.215
2.1	CRM OnPremise Installation and Configuration	0.984	0.212
2.3	Data Querying	0.967	0.208
2.2	Customization of CRM Process	0.866	0.187
2.4	CRM Performance Control and Optimization	0.825	0.178
		4.643	
3	Business Analyze Skills		
3.2	Analytical and Technical Documentation Capability	1.000	0.370
3.3	CRM Reporting capability	0.857	0.317
3.1	Business Process Analyze Skills	0.843	0.312
		2.700	
4	Project Management Skills		
4.1	Capacity Planing	1.000	0.512
4.2	Project Planning Skills	0.952	0.488
		1.952	

The final weights of sub-criteria are calculated by multiplying with the main criteria weight results and the criteria's final relative weight is shown in Table 3-9.

Table 3-9: The relative final weights

	Criteria and Sub Criteria	Relative Weights
1	<i>Communication and Relation Skills</i>	<i>0.247</i>
1.1	Ethical Perspective	<i>0.088</i>
1.3	Client and Colleague Communication	<i>0.085</i>
1.2	Capability of Training	<i>0.073</i>
2	<i>Development/Technical Skills</i>	<i>0.285</i>
2.5	Main CRM function knowledge and experience	<i>0.061</i>
2.1	CRM OnPremise Installation and Configuration	<i>0.060</i>
2.3	Data Querying	<i>0.059</i>
2.2	Customization of CRM Process	<i>0.053</i>
2.4	CRM Performance Control and Optimization	<i>0.051</i>
3	<i>Business Analyze Skills</i>	<i>0.243</i>
3.2	Analytical and Technical Documentation Capability	<i>0.090</i>
3.3	CRM Reporting capability	<i>0.077</i>
3.1	Business Process Analyze Skills	<i>0.076</i>
4	<i>Project Management Skills</i>	<i>0.231</i>
4.1	Capacity Planing	<i>0.118</i>
4.2	Project Planning Skills	<i>0.113</i>

3.3 Ranking Alternatives by Using WASPAS

The Weighted Aggregates Sum Product Assessment (WASPAS) method [12] was used to rank alternatives. These alternatives are CRM Consultants this study and Alternatives are shown in Table 3-10. WASPAS method based on two main methods which are Weighted Sum (WS) and Weighted Product (WP) method.

Table 3-10: Alternatives

Alternatives	Major Licence Degrees	CRM Consultant Experience(Year)	Ages
A1	Computer Engineering	3	31
A2	Industrial Engineering	6	28
A3	Software Engineering	6	29
A4	Computer Technician	5	30
A5	Statistics	6	33

According to Zavadskas, 2012 study that calculation steps of the WASPAS method are shown below.

Step-1: Form the initial decision matrix.

Evaluation of alternatives which are shown in Table 3-9 is performed and obtained by three decision makers are shown Table 3-11

Table 3-11:Decision Makers

	Position	Experience(Year)
DM1	Manager	25
DM2	Asistant Manager	16
DM3	Team Leader	14

Three decision makers geometric mean results are calculated with Eq-5 and the initial decision matrix is formed.

$$x_{ij} = \left(\prod_{k=1}^3 x_{ij} \right)^{1/3} \quad (\text{Eq-5})$$

Step-2: Normalize the initial matrix.

Qualitative that called benefit criteria which expected maximum value and calculated with Eq-6 and Quantitative that called cost criteria which expected minimum value and calculated with Eq-7.

Normalization is necessary for our study that contains dimensionless and quantitative criteria.

$$\bar{x}_{ij} = \frac{x_{ij}}{\max x_{ij}} \quad (\text{Eq-6})$$

$$\bar{x}_{ij} = \frac{\min x_{ij}}{x_{ij}} \quad (\text{Eq-7})$$

$i= 0, 1, \dots, m$ m =Number of Alternatives

$j=0, 1, \dots, n$ n =Number of Criteria

Step-3: Compute the relative significance of i -th alternative using the Weighted Sum(WS) method. One of the MCDM methods must be used for evaluating the criteria weights. SWARA method was used for this aim in this study.

$$Qi^{(1)} = \sum_{j=1}^n \omega_j x_{ij} \quad (\text{Eq-8})$$

w_j are weights of criteria that calculated with SWARA

Step-4: Calculation relative significance of i -th alternative Using Weighted Product(WP) method

$$Qi^{(2)} = \prod_{j=1}^n x_{ij}^{w_j} \quad (\text{Eq-9})$$

w_j are weights of criteria that calculated with SWARA

Step-5: Calculation of the total relative significance for each alternative.

$$Q_i = \lambda Qi^{(1)} + (1 - \lambda)Qi^{(2)} \quad (\text{Eq-10})$$

λ is the coefficient and $\lambda \in [0,1]$.

3.3.1 Application of WASPAS

Step-1: Form the initial decision matrix

Criteria are scored by decision makers according to Table 3-12. Criteria 2.1 ranks by the number of error quantity and Criteria 4.2 is the year of experience into CRM projects. The results of every decision makers are shown in Table 3-13 and the geometric mean value of decision-makers matrix is shown in Table 3-14 that calculated with Eq-5.

Table 3-12: Scores

Definition	Score
Not Acceptable	1
Bad	2
Normal	3
Good	4
Perfect	5

Table 3-13: Initial Decision Matrix-1

Criteria	Ethical Perspective			Client and Colleague Communication			Capability of Training			Main CRM function knowledge			CRM OnPremise Installation and Configuration Error rate			Data Querying			Customization of CRM Process			CRM Performance Control and Optimization			Analytical and Technical Documentation Capability			CRM Reporting capability			Business Process Analyze Skills			Capacity Planing			Project Planning Experience		
	1.1	1.3	1.2	2.5	2.1	2.3	2.2	2.4	3.2	3.3	3.1	4.1	4.2																										
Alternatives	Max			Max			Max			Max			Min			Max			Max			Max			Max			Max			Max								
	DM1	DM2	DM3	DM1	DM2	DM3	DM1	DM2	DM3	DM1	DM2	DM3	DM1	DM2	DM3	DM1	DM2	DM3	DM1	DM2	DM3	DM1	DM2	DM3	DM1	DM2	DM3	DM1	DM2	DM3	DM1	DM2	DM3	DM1	DM2	DM3			
A1	4	4	5	4	4	4	4	4	4	3	3	3	4	4	4	3	3	2	3	3	3	3	3	3	4	4	3	3	4	4	2	3	4	3	3	3	3	3	3
A2	4	4	4	4	5	3	3	5	4	5	4	4	4	4	4	5	4	4	5	5	4	4	4	3	4	4	3	4	4	4	3	4	3	4	4	4	6	6	6
A3	4	3	3	3	4	3	2	3	3	4	5	4	3	3	3	3	3	3	4	4	4	4	4	3	4	4	4	3	3	3	3	4	3	4	4	4	6	6	6
A4	3	3	4	2	3	2	3	4	3	5	4	4	2	2	2	4	4	3	4	4	4	4	3	3	3	3	3	4	3	3	4	3	3	4	3	3	5	5	5
A5	3	2	3	3	3	3	4	3	3	5	4	4	4	4	4	4	5	5	4	4	4	3	3	3	3	3	3	3	2	2	3	3	3	3	3	3	6	6	6

Table 3-14:Initial Decision Matrix-2

Criteria	1.1	1.3	1.2	2.5	2.1	2.3	2.2	2.4	3.2	3.3	3.1	4.1	4.2
	Max	Max	Max	Max	Min	Max	Max	Max	Max	Max	Max	Max	Max
A1	4.309	4.000	4.000	3.000	4.000	2.621	3.000	3.000	3.634	3.634	2.884	3.000	3.000
A2	4.000	3.915	3.915	4.309	4.000	4.309	4.642	3.634	3.634	4.000	3.302	4.000	6.000
A3	3.302	3.302	2.621	4.309	3.000	3.000	4.000	3.634	4.000	3.000	3.302	4.000	6.000
A4	3.302	2.289	3.302	4.309	2.000	3.634	4.000	3.302	3.302	3.000	3.302	3.302	5.000
A5	2.621	3.000	3.302	4.309	4.000	4.642	4.000	3.000	3.000	2.289	3.000	3.000	6.000

Step-2: Normalize the initial decision matrix.

Normalization is necessary for our study that contains quantitative criteria such as criteria 2.1 and the rest of the criteria dimensionless. A normalized decision matrix is calculated by using Eq-6 and quantitative criteria 2.1 is calculated by using Eq-7. The results are shown in Table 3-15.

Table 3-15:Normalized decision matrix

Criteria	1.1	1.3	1.2	2.5	2.1	2.3	2.2	2.4	3.2	3.3	3.1	4.1	4.2
	Max	Max	Max	Max	Min	Max	Max	Max	Max	Max	Max	Max	Max
A1	1.000	1.000	1.000	0.696	0.500	0.565	0.646	0.825	0.909	0.909	0.874	0.750	0.500
A2	0.928	0.979	0.979	1.000	0.500	0.928	1.000	1.000	0.909	1.000	1.000	1.000	1.000
A3	0.766	0.825	0.655	1.000	0.667	0.646	0.862	1.000	1.000	0.750	1.000	1.000	1.000
A4	0.766	0.572	0.825	1.000	1.000	0.783	0.862	0.909	0.825	0.750	1.000	0.825	0.833
A5	0.608	0.750	0.825	1.000	0.500	1.000	0.862	0.825	0.750	0.572	0.909	0.750	1.000

Step-3: Application of WS

The calculation results of the WS method are shown in Table 3-16. Eq-8 is used for the calculation of WS. Weights that calculated by SWARA method results are shown as w_j .

Table 3-16:Results of WS

Criteria	1.1	1.3	1.2	2.5	2.1	2.3	2.2	2.4	3.2	3.3	3.1	4.1	4.2	
Weights	0.088	0.085	0.073	0.061	0.060	0.059	0.053	0.051	0.090	0.077	0.076	0.118	0.113	
	Max	Max	Max	Max	Min	Max	Max	Max	Max	Max	Max	Max	Max	
A1	0.088	0.085	0.073	0.043	0.030	0.034	0.034	0.042	0.082	0.070	0.066	0.089	0.056	0.793
A2	0.082	0.084	0.072	0.061	0.030	0.055	0.053	0.051	0.082	0.077	0.076	0.118	0.113	0.953
A3	0.068	0.070	0.048	0.061	0.040	0.038	0.046	0.051	0.090	0.058	0.076	0.118	0.113	0.877
A4	0.068	0.049	0.060	0.061	0.060	0.047	0.046	0.046	0.074	0.058	0.076	0.098	0.094	0.837
A5	0.054	0.064	0.060	0.061	0.030	0.059	0.046	0.042	0.067	0.044	0.069	0.089	0.113	0.799

$$Q^{(1)} = \sum_{j=1}^n \omega_j T_{ij}$$

Step-4: Application of WP.

The calculation results of the WP method are shown in Table 3-17. Eq-9 is used for calculating the WP. Weights that calculated by SWARA method results are shown as W_j .

Table 3-17:Results of WP

Criteria	1.1	1.3	1.2	2.5	2.1	2.3	2.2	2.4	3.2	3.3	3.1	4.1	4.2	$Q^{(2)} = \prod_{j=1}^n \Gamma_{ij}^{w_j}$
Weights	<i>0.088</i>	<i>0.085</i>	<i>0.073</i>	<i>0.061</i>	<i>0.060</i>	<i>0.059</i>	<i>0.053</i>	<i>0.051</i>	<i>0.090</i>	<i>0.077</i>	<i>0.076</i>	<i>0.118</i>	<i>0.113</i>	
	Max	Max	Max	Max	Min	Max	Max	Max	Max	Max	Max	Max	Max	
A1	1.000	1.000	1.000	0.978	0.959	0.967	0.977	0.990	0.991	0.993	0.990	0.967	0.925	0.764
A2	0.993	0.998	0.998	1.000	0.959	0.996	1.000	1.000	0.991	1.000	1.000	1.000	1.000	0.937
A3	0.977	0.984	0.970	1.000	0.976	0.974	0.992	1.000	1.000	0.978	1.000	1.000	1.000	0.860
A4	0.977	0.953	0.986	1.000	1.000	0.986	0.992	0.995	0.983	0.978	1.000	0.978	0.980	0.823
A5	0.957	0.976	0.986	1.000	0.959	1.000	0.992	0.990	0.974	0.958	0.993	0.967	1.000	0.777

Step-5: Compute the total relative significance.

The computation of total relative significance is calculated for different values of λ by using Eq-9. The results are shown in Table 3-18 and Figure 3-2.

Table 3-18:Result of the total relative significance

λ	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	Ranking	
Alternatives	A1	0.767	0.769	0.772	0.775	0.778	0.781	0.784	0.787	0.790	5
	A2	0.939	0.940	0.942	0.944	0.945	0.947	0.949	0.950	0.952	1
	A3	0.861	0.863	0.865	0.867	0.868	0.870	0.872	0.874	0.876	2
	A4	0.824	0.826	0.827	0.828	0.830	0.831	0.833	0.834	0.835	3
	A5	0.779	0.781	0.784	0.786	0.788	0.790	0.792	0.795	0.797	4

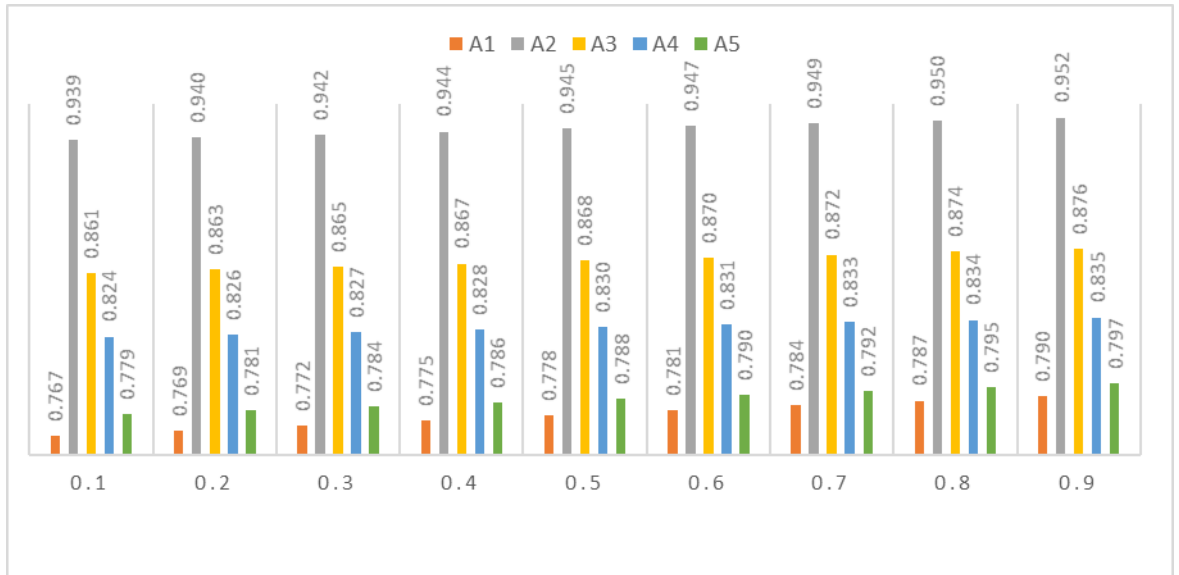


Figure 3-2: Results of the total relative significance

3.3.2 Discussion of Results

Results of calculations show us that the most appropriate CRM Consultant is Alternative 2 which the highest value belongs to Alternative 2. Alternative 3 is the next best choice that has the second-highest score. The results also show us that Industrial Engineers can show higher performance than other disciplines such as Computer and Software engineers although alternative-2 experience is less than the others.

Total relative importance calculations are applied for different coefficient values for understanding the changes in results that can be seen in Figure 3-2. Different coefficient values calculation results do not change the ranking of alternatives, so we can claim that results are consistent. According to Zavadskas, 2012 study when $\lambda = 0$ WASPAS is transformed to WPM and $\lambda = 1$ WASPAS is transformed to WSM. This situation is shown for Alternative-2 in Figure 3-3. And WASPAS method is the integration of WSM and WPM. When considering the equal contribution of these two models, λ value will be the 0.5. Computing the rankings of three MCDM method are also the same and it is shown Figure 3-4.

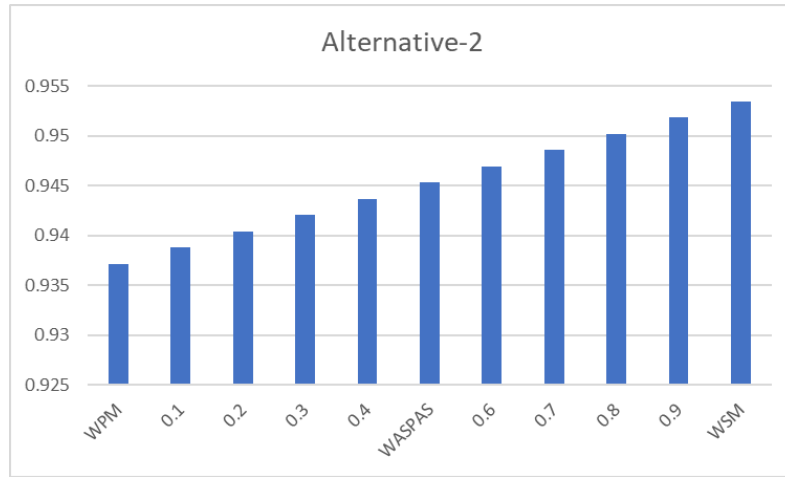


Figure 3-3: Comparison of WS and WP Method with Different Coefficients

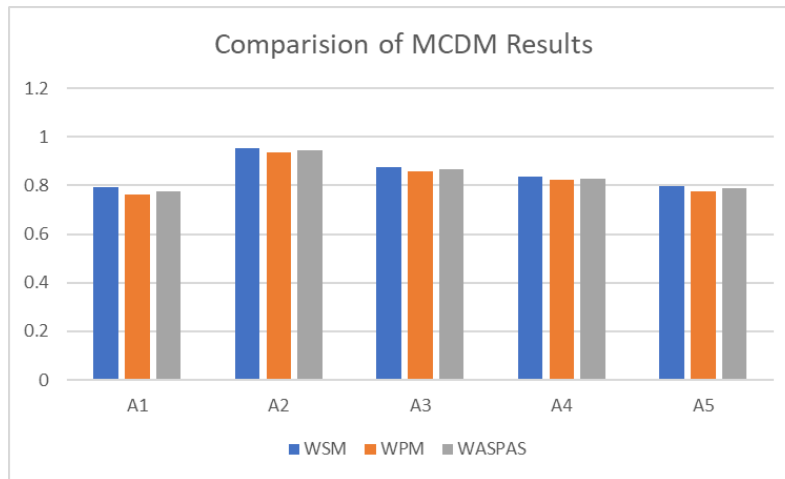


Figure 3-4: Comparison of MCDM Results

CHAPTER 4

4. CONCLUSION

CRM is one of the important investments for companies, but create value in companies with CRM is not easy to apply and also needs to create a high amount of budgets. This situation increases the importance of the success of CRM implementation projects. At this point, CRM consultants must lead accurately and companies have to work with the right CRM consultants if they do not want to waste a high amount of money. This paper is important for the evaluation of the CRM Consultants and study is clearly defined example for SWARA and WASPAS which can be applied easily for different alternatives by CRM consultancy companies for evaluation of the CRM consultants and also the most common CRM models and CRM implementation project steps are defined in this study.

According to my observations that CRM can be defined as Customers approach, Sales strategies, and processes that are ensured to be applicable for the organization in certain standards. As a result of my observations and professional experience, defining the CRM consultant with the same approach mentioned above shows that the consultant should be an individual who designs an applicable CRM product and solves the implementation issues.

After Industry 4.0, CRM applications and processes have started to evolve. Quantity and characteristics of customer data have changed significantly and cloud systems have become necessary due to big data management has become very crucial. Most of the CRM vendors encourage to use of CRM Online and mobile utilization. CRM processes have improved as a consequence of changing customer behaviors. Industry 4.0 revolution results in creating enormous opportunities for CRM Markets correspondingly, CRM Consultants should be discovering the ways of developing new solutions for CRM systems continuously.

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APPENDICES

APPENDIX A

- CRM describes a strategic emphasis on improving long-term performance of an organization through sustained efforts to build enduring and mutually productive Relationships with selected customers. [7]
- In the academic community, the terms “Relationship marketing” and CRM are often used interchangeably [29]
- CRM is more commonly used in the context of technology solutions and has been described as “information-enabled Relationship marketing” [7]
- CRM is an e-commerce application [29]
- CRM is a term for methodologies, technologies, and e-commerce capabilities used by companies to manage customer Relationships. [30]
- CRM is an enterprise-wide initiative that belongs in all areas of an organization [31]
- CRM is a comprehensive strategy and process of acquiring, retaining, and partnering with selective customers to create superior value for the company and the customer. [32]
- CRM is about the development and maintenance of long-term, mutually beneficial relationships with strategically significant customers [5]
- CRM includes numerous aspects, but the basic theme is for the company to become more customer-centric. Methods are primarily Web-based tools and Internet presence. [33]
- CRM can be viewed as an application of one-to-one marketing and Relationship marketing, responding to an individual customer on the basis of what the customer says and what else is known about that customer [34]
- CRM is a management approach that enables organizations to identify, attract, and increase retention of profitable customers by managing Relationship with them [35]

APPENDIX A (Continued)

- CRM involves using existing customer information to improve company profitability and customer service [36]
- CRM attempts to provide a strategic bridge between information technology and marketing strategies aimed at building long-term relationships and profitability. This requires “information-intensive strategies” [37]
- CRM is data-driven marketing [38]
- CRM is an enterprise approach to understanding and influencing customer behavior through meaningful communication to improve customer acquisition, customer retention, customer loyalty, and customer profitability [39]

APPENDIX B

<i>Authors</i>	<i>Research Objective</i>	<i>Methods</i>	<i>Title</i>	<i>Modeling</i>
(Zolfani, Aghdaie, Derakhti, Zavadskas, & Varzandeh, 2013)	Using SWARA and WASPAS for selection the shopping mall location	SWARA and WASPAS	Decision making on business issues with foresight perspective; an application of new hybrid MCDM model in shopping mall locating	Swara used for finding weights ans WASPAS used for ranking alternatives
(ZOLFANI, MAKNOON, & ZAVADSKAS, 2014)	Evaluating the strategies of Nash Equilibriums by using SWARA and WASPAS	SWARA and WASPAS	Multiple nash equilibriums and evaluation of strategies. new application of mcdm methods	MCDM methos is used for decision making if there are more then two Nash Equilibrium
(Vafaeipour , Zolfani, Varzandeh, Derakhti, & Eshkalag, 2014)	Using SWARA and WASPAS for selection the site for wind energy	SWARA and WASPAS	Assessment of regions priority for implementation of solar projects in Iran: New application of a hybrid multi-criteria decision making approach	Swara used for finding weights ans WASPAS used for ranking alternatives
(Nezhad, Hashemkhani Zolfani, Moztarzadeh, & Zavadskas, 2015)	Evaluating and ranking high technology selection by using SWARA	SWARA and WASPAS	Planning the priority of high tech industries based on SWARA-WASPAS methodology: The case of the nanotechnology industry in Iran	Swara used for finding weights ans WASPAS used for ranking alternatives
(UROSEVIC, KARABASEVIC, STANUJKIC., & MAKSIMOVIC, 2017)	Using SWARA and WASPAS for personal selection	SWARA and WASPAS	An approach to personnel selection in the tourism industry based on the swara and the waspas	Swara used for finding weights ans WASPAS used for ranking alternatives
(Mardani, et al., 2017)	Overview of the theory and applications of WASPAS and SWARA.	PRISMA	A systematic review and meta-Analysis of SWARA and WASPAS methods: Theory and applications with recent fuzzy developments	Systematic review ans meta analysis(Prisma) is used for classified
(Adalı and Işık 2017)	Using SWARA and WASPAS for evaluation of the suppliers	SWARA and WASPAS	The decision making approach based on swara and waspas methods for the supplier selection problem	Swara used for finding weights ans WASPAS used for ranking alternatives
(Yurdođlu & Kunfakçı, 2017)	Using SWARA and WASPAS for deciding the Server	SWARA and WASPAS	Server Selection with SWARA and WASPAS Methods	Swara used for finding weights ans WASPAS used for ranking alternatives

APPENDIX B (Continued)

<i>Authors</i>	<i>Research Objective</i>	<i>Methods</i>	<i>Title</i>	<i>Modeling</i>
(Khodadadi, et al, 2017)	Using SWARA and WASPAS for evaluation of advance oxidation processes(AOPs)	SWARA and WASPAS	A hybrid MADM analysis in evaluating process of chemical wastewater purification regarding to advance oxidation processes	Swara used for finding weights ans WASPAS used for ranking alternatives
(Çağlı, et al. 2018)	Using SWARA and WASPAS for evaluation of the suppliers	SWARA and WASPAS	Supplier Selection Based on SWARA-WASPAS Methodology: The Case of the Iron Steel Industry in Turkey	Swara used for finding weights ans WASPAS used for ranking alternatives
(Çakır, Akel, & Doğaner, 2018)	Using SWARA and WASPAS for evaluation of the private shopping sites.	SWARA and WASPAS	Evaluation of private shopping sites in turkey by integrated swara - waspas method	Swara used for finding weights ans WASPAS used for ranking alternatives
(Sremac, Stević, Pamučar, Arsić, & Matić, 2018)	Using SWARA and WASPAS for evaluation of the third-part logfistics firms	SWARA and WASPAS	Evaluation of a Third-Party Logistics (3PL) Provider Using a Rough SWARA–WASPAS Model Based on a New Rough Dombi Aggregator	Swara used for finding weights ans WASPAS used for ranking alternatives
(Safari, et al,2018)	Using SWARA and WASPAS for evaluation of gas transmissions	SWARA and WASPAS	Performance Assessment of Iranian Gas Transmission Company’s Operational Zones through a Hybrid Method of DEA – WASPAS – SWARA	Swara used for finding weights ans WASPAS used for ranking alternatives
(Prajapati, Kant, & Shankar, 2019)	Identify and prioritize the solution by using SWARA and WASPAS	SWARA and WASPAS	Prioritizing the solutions of reverse logistics implementation to mitigate its barriers: A hybrid modified SWARA and WASPAS approach	Swara used for finding weights ans WASPAS used for ranking alternatives
Yucenur, Subasi, 2019	Using SWARA and WASPAS for evaluation of the city for launching ramp	SWARA and WASPAS	An integrated solution for space shuttle launching ramp	Swara used for finding weights ans WASPAS used for ranking alternatives
(İpekçi, 2019)	Using SWARA and WASPAS for evaluation place for energy plant	SWARA and WASPAS	The Selection of the Location For Planning Current Energy Plant In Turkey With SWARA and WASPAS Methods	Swara used for finding weights ans WASPAS used for ranking alternatives
(Bausys, Cavallaro, & Semenas, 2019)	Weighted Aggregated Sum Product Assessment—Single-Valued Neutrosophic Sets(WASPAS-SVNS) applied for performance of the autonomomous agents	SWARA and WASPAS-SVNS	Application of Sustainability Principles for Harsh Environment Exploration by Autonomous Robot	Swara used for finding weights ans WASPAS and WASPAS-SVNS used for ranking alternatives