

## **A Proposed Model for Employee Competencies in Hospitality 4.0 Talent Management: H4TM**

**Ebru ESENDEMIRLI<sup>1</sup>**  
**Yücel ÖZTÜRKOĞLU<sup>2</sup>**  
**Ferika Özer SARI<sup>3</sup>**

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### **Abstract**

Purpose of this study is to specify and prioritize the employee competencies in the context of key specialist jobs in lodging industry and to introduce a model as “Hospitality 4.0 Talent Management”. This study integrates the qualitative and quantitative approaches. To evaluate the performance of Talent Management with Hospitality 4.0 perspective, the valid and reliable criteria are determined by a literature review. Next stage was to find out the weight and importance of each identified dimension, by use of Best- Worst- Method (BWM). As a result, a novel model is proposed to help lodging organizations to specify and prioritize their key employees’ competencies in terms of hard, soft and mixed skills for H4TM, thus to map their post Covid -19 talent management practices effectively.

**Keywords:** Lodging Sector; Hospitality 4.0; Talent Management; Employee Competencies; BWM

**JEL Code:** M10; M12

### **1. Introduction**

Tourism and hospitality industry is among the fastest-growing industries and, by 2030; it is expected to be 1.8 billion international travels globally (UNWTO, 2017). According to International Labor Organization (ILO, 2022) tourism and hospitality industry is one of the highest job creating sectors due to its labor intensive structure. On the other hand, excessive growth of the tourism and hospitality industry leads to the environmental and socio-cultural challenges in the destinations. Besides these problems, “human capital” that is crucial for hospitality organizations in terms of

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<sup>1</sup> Prof. PhD, Yaşar University, Izmir- Turkey, ebru.esendemir@yasar.edu.tr  
ORCID ID: 0000-0002-0458-8740

<sup>2</sup> Prof., PhD, Yaşar University, Izmir- Turkey, yucel.ozturkoglu@yasar.edu.tr  
ORCID ID: 0000-0002-9569-8178

<sup>3</sup> Assoc. Prof. PhD, Yaşar University, Izmir- Turkey, ferika.ozersari@yasar.edu.tr  
ORCID ID: 0000-0001-9899-256X

service quality and competitiveness (Kusluvan et al., 2010), takes place in the foreground of the sectoral difficulties. The remarkable facet of the hospitality industry comes true from generating a sense of well-being in people's life (Pizam & Shani, 2009) and there is no doubt that the hospitality employees are the major actors.

The hospitality industry is considerably competitive because it is a very attractive and expanding business. Additionally, talented human capital is a pre-eminent source of advantage against competitors. Despite the extensive definitions of hospitality workers as “low skill”, implicitly, talent has an important place in the sector (Baum, 2008). From this point of view, it is inevitable for lodging companies, first to be aware of their employees’ talent and competencies and then to prioritize them in Hospitality 4.0 Talent Management (H4TM).

In hospitality industry where digitalization is getting more apparent every day, it is necessary to use the power of technology and to keep up with the digital trends, in other words Hospitality 4.0. At the present time, industry 4.0 implementations are widely employed around the world, and they have a massive impact on all businesses, including the tourism and hospitality industry, resulting in extraordinary changes. Additionally, artificial intelligence advancements have opened new possibilities for digital transformation for lodging sector. Tourism 4.0 apps are widely employed in hotels based on industry 4.0 since tourism is a flexible industry that swiftly adopts the newest technology innovations. In this regard, hospitality employees need to be in touch with technology, especially those who work in the related departments.

Therefore, this study is primarily concerned with specifying and prioritizing the relationship between the hard, soft and mixed skills for H4TM in the context of key specialist jobs in the lodging industry. After the introduction, the second part consists of the talent management in hospitality in general. The third part deals with the industry 4.0 technologies in hospitality industry. Subsequently, hard and soft skills in hospitality 4.0 talent management concepts are explained. After the methodology and analysis of the study, the last part consists of the conclusion, implications, limitations and further research.

## **2. Talent Management in Hospitality**

Talent management is a relatively new concept in the business world. As a brief definition, talent management is *“the systematic attraction, identification, development, engagement, retention, and deployment of those individuals who are of particular value to an organization.”* (CIPD, 2021). With this approach, if the organizations can keep their talented staff, they may increase productivity, service quality and learning culture in the organization and competitiveness in its industry, as well (CIPD, 2021). Michaelis et al. (2001) defined five essentials for the companies that want to retain their talented staff to gain competitive advantage, as follows:

*“Embrace a talent mindset; Craft a winning employee value proposition; Rebuild the recruiting strategy; Weave development into the organization; Differentiate and affirm the people”.*

In hospitality and lodging industry, high levels of employee turnover continue to be the primary challenge (Walsh and Taylor, 2007), where there is a general scarcity of trained workers and managers, necessitating the use of talent management and development programs (Johnson et al., 2019). In order to adapt the businesses, facilities and their employees to today’s Hospitality 4.0 age, it is necessary to use valid and up-to-date methods (Stankov & Gretzel, 2020). Additionally, daily operations might be critical for lodging organizations that need talented staff. The variety of the lodging employees makes it complicated for employers to implement talent management, and consequently, each company might have a specific definition of talent that best matches its structure and culture (D’Annunzio- Green, 2008).

Parallel to this point of view, Walsh & Taylor (2007) examined the challenge of retaining managerial talent in an organization. In 2008, Maxwell and MacLean stated that in hospitality industry *“with generally high labor turnover and rather negative public image, talent management has significant potential to contribute to changing approaches to managing people.”* Again, in 2008, D’Annunzio- Green’s study provided the senior management’s perspective on the challenges of managing talent in the hospitality organizations. In another study, researchers reviewed the literature and proposed a model for talent management in the tourism and hospitality industry, including some external and internal influences (Nzozzo and Chipfuva, 2013). In a more recent study by Sheehan et al. (2018), it is provided an academic viewpoint on modern factors related with talent management in the hospitality businesses. Marinakou and Giousmpasoglou (2019) argue that a *“one-size-fits-all solution”* for talent management and talent retention is not convenient since they should be tailored to the organization, and to the person, as well. One of the latest studies (Kravariti et al., 2021) reveals that talent management in hospitality is a rapidly emerging field of study; however, the limited number of conceptual and empirical papers shows that the field is far from the maturity age.

Considering the existing literature on the hospitality talent management, it can be said that there is a need to connect talent management and hospitality 4.0, particularly in terms of proposing key concepts for their dimensions.

### **3. Industry 4.0 Technologies in Hospitality Industry**

The various Industry 4.0 technologies used in hospitality sector includes Cyber-Physical Systems (CPS), Internet of Things (IoT), Cloud Computing (CC), Big Data, Artificial Intelligence (AI) and robotics (Osei et al., 2020). The hotel industry can utilize IoT to deliver integrated services such as smart keys, set-top-boxes, thermostats,

telephones, light switches, voice-based interaction, electric blinds and other devices that are connected on a common network to enable the services that guests desire (Car et al., 2019). Industrial robots, tele-presence devices, robotic guides and assistants are used in hotels for front desk, concierge, delivery, and restaurant services (Papathanasis, 2017). The robots are multi-lingual and deliver customized service experience 24/7 resulting in cost savings, increased efficiency, and customer satisfaction. This will lead a transition in the hospitality industry toward social, cognitive, and systems-related skills (Cain et al. 2019).

The impact of the Covid-19 virus on the worldwide hospitality is posing extraordinary challenges and problems. Travel restrictions, adoption of virtual conferences, meetings, and distance working, as well as reductions in sports and other socio-cultural activities have all had a negative impact on the industry, resulting in job losses. Scholars have argued for the use of technology as a primary strategy for coping with the effects of Covid-19 on the hotel industry (Osei et al., 2020). Due to Covid-19, there was an increase in demand for automation, robotics, digitalization, and the internet of things in the industry. Although the industry relies heavily on soft-skills for employee competencies, employees should have creative and cognitive skills, as well as a willingness to change, in order to reduce internal customer resistance (Ivanov and Webster, 2017).

According to research exploring the impact of technology on different occupations, accommodation and food services have the highest percentage of jobs at risk due to automation (CitiGPS, 2015). Automation will affect low-skilled jobs such as cleaners, food and beverage personnel high-skilled jobs like facilities manager, conference managers, and marketing managers will require skills that are more complex. Routine activities will be automated, reducing demand for lower-skilled and routine-intensive employment. On the other hand, the demand for high-skilled workers with novel skills will increase. While some jobs will be automated, new jobs such as social media account manager, web project manager, and digital communications planner will emerge (Karacay, 2018).

Industry 4.0 practices, such as increased automation and digitalization, lead to huge changes in business models and organizational roles. The aim of this study, therefore, is to identify the skills for hospitality managerial jobs in the industry 4.0 era. In addition, an employee competencies model in hospitality 4.0 talent management is proposed. The next section provides a conceptual framework from the literature for employee skills in hospitality industry.

#### **4. Skills in Hospitality 4.0 Talent Management**

Engaging employees with the right competencies is critical at every stage of talent management, including hiring, retention, career development, and compensation (Hughes and Rog, 2008; Kravariti et al., 2021). According to Golubovskaya et al. (2019), most of the industry workforce is operational and service-oriented, with customer-facing roles, relying on a younger, contingent, often seasonal, and lower skilled employees. There is a shortage of skilled staff and managers in tourism and hospitality (Johnson et al., 2019). Several authors have conducted research on the skills required in the hospitality industry. Since the 1980s, most studies have focused on soft skills (Weber et al., 2010; Weber et al., 2013; Sisson and Adams, 2013; Weber et al., 2020). The increasing applications of Industry 4.0 technologies and Covid-19 measures will lead to a transition of the required skills in the hospitality sector. Employing workers with hard skills, as well as soft skills and mixed skills that integrate both hard and soft skills will allow the industry to achieve customer satisfaction and value creation. Hard and soft skills are not mutually exclusive they are complementary (Alsabbah and Ibrahim, 2013). In this section, skills for hospitality management positions are proposed using the conceptual framework shown in Table 1. The articles were selected from those that recently investigated skills in the hospitality industry.

**Table 1.** Skills in Hospitality 4.0 Talent Management

	<b>Skills</b>	<b>Authors</b>
<b>Hard Skills</b>	ICT skills	Bharwani and Talib, 2017; Kuo et al. 2017; Adeyinka-Ojo, 2018; Johnson et al., 2019
	Technical expertise	Bharwani and Talib, 2017; Adeyinka-Ojo, 2018; Golubovskaya et al., 2019; Johnson et al., 2019; Bagheri et al., 2020;
	Cognitive skills	Bharwani and Talib, 2017; Kuo et al. 2017; Adeyinka-Ojo, 2018; Johnson et al., 2019; Bagheri et al., 2020;
	Planning and decision-making	Weber et al., 2013; Bharwani and Talib, 2017; Adeyinka-Ojo, 2018; Jooss et al., 2019;

	Problem solving skills	Weber et al., 2013; Bharwani and Talib, 2017; Adeyinka-Ojo, 2018; Jooss et al., 2019; Bagheri et al., 2020
Soft Skills	Communication skills	Weber et al., 2013; Bharwani and Talib, 2017; Adeyinka-Ojo, 2018; Jooss et al., 2019; Bagheri et al., 2020;
	Interpersonal/social skills	Weber et al., 2013; Bharwani and Talib, 2017; Adeyinka-Ojo, 2018; Golubovskaya et al., 2019; Johnson et al., 2019; Jooss et al., 2019; Bagheri et al., 2020
	Teamwork orientation	Weber et al., 2013; Bharwani and Talib, 2017; Adeyinka-Ojo, 2018; Jooss et al., 2019;
	Adaptability and flexibility	Bharwani and Talib, 2017; Jooss et al., 2019;
	Leadership	Weber et al., 2013; Bharwani and Talib, 2017; Golubovskaya et al., 2019; Johnson et al., 2019; Jooss et al., 2019;
	Mixed Skills	Creativity and innovation
Change management		Bharwani and Talib, 2017
Entrepreneurial skills		Nieto et al., 2011; Adeyinka-Ojo, 2018; Jooss et al., 2019; Bagheri et al., 2020

**Source:** Authors' creation

### Hard Skills

Hard skills are task-oriented and are associated with technical expertise (Alsabbah and Ibrahim, 2013). These skills typically necessitate the acquisition of knowledge, are generally cognitive and are influenced by an individual's IQ score (Weber, 2013). As hard skills in H4TM, this study includes information and communication technology (ICT) skills, technical expertise, cognitive skills, planning, decision-making and problem-solving skills. *ICT skills* are fundamental computer skills that involve using technology to find, analyze and report information (Adeyinka-

Ojo, 2018). They are basic computer literacy skills as well as the expertise of operational systems such as hotel property management systems and point-of-sale (POS) systems (Bharwani and Talib, 2017). Skill shortages are projected, according to Kuo et al. (2017), as the new business model based on robotics technology creates new types of occupations that necessitate ICT skills. As a result, there is a discrepancy between the skills that are needed and those that are provided. Bagheri et al. (2020) used a knowledge indicator to describe *technical expertise*. As associate factors with knowledge, the authors proposed technical language competence, acquaintance with industry, expertise in areas of operations, and familiarity with various cultures. Similarly, Adeyinka-Ojo (2018) states that knowledge is a basic component of technical skills, and those indicators include industry-specific skills, operational skills, financial, legal, and marketing skills.

*Cognitive skills* are made up of a combination of facts and procedures for applying those facts. To put it another way, cognitive talents combine logical and procedural knowledge. Furthermore, cognitive abilities can be developed by education and experience. (Royer et al., 2013). Johnson et al. (2019) describes cognitive abilities as "generic skills such as willingness to learn, initiative, capacity to follow instructions, and ability to adapt in a changing environment". Learning is defined as a dedication to personal and professional improvement, as well as a desire to keep one's knowledge and abilities up to date (Bharwani and Talib, 2017). For organizational efficiency and competitive advantage, learning is a top priority in talent development. Therefore, new training and development programs are necessary for existing employees (Kuo et al., 2017). The learning process facilitates the development of new innovative services with new technologies. Analytical/critical thinking, strategic thinking, systems thinking, and information gathering skills are some of the other significant cognitive skills. The ability to analyze events and industry trends is what analytical thinking is about. Strategic and systems thinking refers to the ability to arrive at well-thought-out findings and solutions based on observation, interpretation, inference, analysis, and evaluation (Bharwani and Talib, 2017). Because of observation, interpretation, inference, analysis, and assessment, strategic and systems thinking is the ability to reach well-reasoned conclusions and solutions that are built on logic (Adeyinka-Ojo, 2018).

*Planning and decision-making* and *problem-solving skills* are higher cognitive abilities. Planning and decision making refers to the capacity to establish a systematic course of action to assure the attainment of certain objectives by defining priorities, goals, and timelines, as well as the ability to make well-informed, effective, and timely decisions (Bharwani and Talib, 2017). People with problem-solving abilities come up with innovative ideas, are practical, and take the initiative in finding and problem resolution (Adeyinka-Ojo, 2018). They may overcome problems by creating innovative solutions to difficulties and negotiating conflicts in a calm, non-defensive manner (Bharwani and Talib, 2017).

### Soft Skills

Soft skills are interpersonal, human, emotional or behavioral abilities that are required to apply technical knowledge and skills in the business (Weber, 2013). Soft skills are predominantly affective and behavioral in nature, impacted by an individual's emotional quotient, and emphasize personal behavior and relationship management (Alsabbah and Ibrahim, 2013). Human skills are soft skills, whereas hard skills are more directly related to the actions of employees daily. Soft skills are the same as personal skills that are concerned with attitude and behavior. Personal development, social involvement, and professional success all require soft skills (Anthonious, 2021). As soft skills in H4TM, this study includes communication skills, interpersonal/social skills, teamwork orientation, adaptability and flexibility, and leadership. Speaking, listening, writing, reading, and negotiating successfully are all *communication skills*, as are verbal and nonverbal communication, storytelling, and cultural and norms awareness. (Weber et al., 2013; Adeyinka-Ojo 2018). *Interpersonal/social skills* also known as emotion management is essential for hospitality employees since they are in a constant contact with clients (Bagheri et al. 2020; Johnson et al., 2019). Confidence, personal presentation, and visitor engagement are among these skills (Adeyinka-Ojo, 2018).

Employees that are good at *teamwork* get along well with their coworkers and clients, and they are aware of cultural sensitivity. They are adaptable to both individual and group work (Adeyinka-Ojo, 2018). With new Industry 4.0 techniques, *adaptability and flexibility* are critical to hospitality businesses (Adeyinka-Ojo, 2018). These are the abilities to adapt one's behavior or manner of approach to match the demands of the situation (Bharwani and Talib, 2017). Hospitality organizations create sustainable *leadership* by re-evaluating the competencies and abilities required from the senior managers and leaders on a regular basis. Hotel managers must establish a holistic and applicable leadership competence framework in the context of the H4TM requirements (Bharwani and Talib, 2017).

### Mixed Skills

For H4TM, this study suggests mixed skills that integrate both hard and soft skills. These skills include creativity and innovation, change management, and entrepreneurial skills. The capacity to discover unique insights into problems, challenge established techniques, and design and implement new or cutting-edge projects are all examples of *creativity and innovation* (Bharwani and Talib, 2017). In another explanation, skilled employee is the one who thinks out of the box and take initiative; is knowledgeable in own field; is adaptable to diversification and the organizational culture (Marinakou and Giousmpasoglou, 2019). *Entrepreneurial skills* according to Adeyinka-Ojo (2018), include idea creation, recognizing opportunity,

environmental scanning, creativity, accountability, vision and judgement. It is critical to maintain a business-oriented perspective and avoid delays in the launch of new goods or services. A particular talent for entrepreneurship would be a special aptitude for embarking on and exploiting new chances, seeking for knowledge, and making judgments in the face of uncertainty in the quest of profits while accepting implicit risks. (Nieto et al., 2011). *Change management* is the process of coping with technology advancements and changing work habits (Adeyinka-Ojo 2018) It's the capacity to deal with change, define a compelling change vision, manage change, and energize it by removing barriers and/or speeding up the pace (Bharwani and Talib, 2017).

To understand the main subject of the study and suggest managerial implications, it is very important to analyze the relationship between each skill and calculate their weights in themselves. Therefore, the Best Worst Method will be used for this purpose.

## 5. Methodology: Best-Worst Method

Among the multi criteria decision-making (MCDM) methods, the newest is the Best-Worst Method (BWM) developed by Rezaei (2015). Unlike other MCDM methods, the method focuses on choosing the best and worst alternatives among the alternatives to be decided. The biggest advantage of this method is that decision makers do not want pairwise comparisons between all determined criteria. The basic logic of the method is, first, the most and least desirable alternatives are determined, and then pairwise comparisons are made between the best and worst alternatives and other alternatives. The consistency ratio is calculated within the reliability of the BWM method. The method was developed in the following years and a minimum and maximum mathematical programming model was created to define the optimal weights of different criteria (Safarzadeh et al., 2018). Although this method based on pairwise comparison is new, it has applications in different subjects and sectors. The method consists of six separate steps; the order of operations is;

**S1:** A number of decision criteria are set.

One or several decision makers decide the  $n$  criteria about the problem.

$$C = \{c_1, c_2, \dots, c_n\}$$

**S2:** The same decision makers are determined the best ( $c_b$ : the most desired) & worst ( $c_w$ : the least desired) criteria from the set of criteria.

**S3:** The preference ratio of the criterion that is the best ( $c_b$ ) chosen according to all other criteria is determined for binary comparison.

The decision maker determines the preference rate. This ratio is as a number between one to nine (where one is equally significant & nine is extremely significant). Then a vector called best-to-others ( $A_B$ ) is reached that goes from best to others. This vector is as follows.

$$A_B = (a_{B1}, a_{B2}, \dots, a_{Bn})$$

Each  $a_{Bj}$  in the  $A_B$  vector shows the preference of  $B$ , which is the best criterion, according to criterion  $j$ . Value is an integer number between one to nine. In addition,  $a_{BB} = 1$ . This means that the most desired and most significant criterion will be compared with itself.

**S4:** The preference ratio of the criterion that is worst ( $c_w$ ) chosen according to all other criteria is determined for binary comparison.

The same procedure that was done in the previous step is repeated for the worst criteria. As a result, the vector emerges which is the worst from the other criteria. Then a vector called ‘Others-to-Worst’ ( $A_W$ ). This vector is as follows.

$$A_W = (a_{1W}, a_{2W}, \dots, a_{nW})^T$$

Each  $a_{jW}$  in the  $A_W$  vector, shows the preference of criterion  $j$  over the worst criterion  $W$ . In addition,  $a_{WW} = 1$ . This means that the worst criterion will be compared to itself.

**S5:** Optimal weights are calculated for each criterion.  $w^* = (w_1^*, w_2^*, \dots, w_n^*)$ .

The optimal weight for the criteria are;  $w_B / w_j = a_{Bj}$  and  $w_j / w_w = a_{jw}$  ( $j = 1, 2, \dots, n$ ). So, to provide these circumstances for whole  $j$ , necessary to obtain a solution where the maximum absolute differences

$|w_B/w_j - a_{Bj}|$  and  $|w_j/w_w - a_{jw}|$  must become minimized.

Also, the weight vector must not be negative and the total condition must be 1. As a result, the following problem arises.

$$\begin{aligned} \min \max \{ & |w_B/w_j - a_{Bj}|, |w_j/w_w - a_{jw}| \} \\ \sum w_j = & 1, \quad w_j \geq 0, \quad \text{for whole } j = 1, 2, \dots, n \end{aligned}$$

The problem equation is transferred to the following linear programming problem.

$$\begin{aligned} \min \xi \quad & |w_B/w_j - a_{Bj}| \leq \xi, \quad \text{for whole } j \\ & |w_j/w_w - a_{jw}| \leq \xi, \quad \text{for whole } j \\ \sum w_j = & 1, \quad w_j \geq 0, \quad \text{for whole } j = 1, 2, \dots, n \end{aligned}$$

**S6:** With the completion and solving of all this model, optimum weights ( $w_1^*, w_2^*, \dots, w_n^*$ ) and  $\xi$  value are obtained.

The value of  $\xi$  expresses the maximum absolute difference and the Consistency Ratio (CR) of the analyzes made. The CR is used to control the reliability of the optimal

weights, it expresses the reliability among the got weights, and the binary comparison data ensured by the DM. CR is shown as follows.

$$CR = \xi^* / CI$$

CR is a number between zero and one ( $CR \in [0, 1]$ ). Zero indicates complete consistency.  $\xi$  indicates the maximum absolute difference found from equation 4. According to the  $c_w$  criterion, determining the largest  $a_{BW}$  preference ratio of the  $c_b$  criterion (1,2, ..., 9), the maximum  $\xi$  value emerges. These maximum values are used as CI. It turned out that the higher the value, the weaker their consistency ratio and the less reliable the comparisons.

In the next section, talent management skills determined with an Industry 4.0 perspective, an application will be made to develop a strategic roadmap for decision makers who want to adopt Hospitality 4.0 in their business, and the BWM method will be applied to explore the relationship between talent management skills.

## 6. Implementation of the Research

The main purpose of this study is to specify and prioritize the hard and soft skills for “Hospitality 4.0 Talent Management (H4TM)” in the context of key specialist jobs in the lodging industry. This is accomplished by investigating the relationship between hard skills and soft skills. Therefore, a two-stage methodology was used in this study. Firstly, a detailed literature review was conducted to specify the dimensions of employee competencies in Hospitality 4.0. As seen in Table 1, five hard skills, five soft skills and three mixed skills are determined from the literature review. Later, the BWM is used to determine the weights and order of importance of these skills. To be able to apply BWM two-round e-questionnaires are conducted to the lodging executives. In the first round, the executives are asked to determine the best and worst criteria for dimensions and each dimension criteria. In the second round, the preference of the best criterion over all others and the preference of all criteria over the worst criterion is determined by those executives’ opinions. Finally, the responses are used as input for the best worst method and to calculate the weights.

Best Worst Method has no limitation of the sample size for the application, and different number of experts have been invited, ranging from three to twenty (Li et al., 2019). Given the number and experience status of the invited lodging experts; the panel of executives is regarded as having enough expertise for this study, such that, it is consisted of seven lodging managers whose working experience in the sector is more than ten years. Table 2 depicts the information related to the research participant executives from lodging sector.

**Table 2:** Information of Lodging Executives

Expert	Working Experience in Lodging Sector	Position/ Title of the Executive
1	23 years	General Manager
2	19 years	Assistant Executive Manager
3	17 years	Rooms Division Manager
4	15 years	Deputy Assistant Manager
5	15 years	Rooms Division Manager
6	15 years	General Manager
7	13 years	Sale & Marketing Director

**Source:** Authors' creation

The research methodology was explained in detail in the previous section. The suggested mathematical model is encoded in AMPL and solved using CPLEX 9.1 with a Pentium IV processor running at 2.8 GHz and 1 GB of RAM. Solving the BWM model can calculate the relative weights of the factors. By solving the BWM model, the weights of main skills criteria and sub-skills were determined.

It would be better to interpret the results of the analysis first in the category of each skill and then in general. According to BWM's results, *planning & decision-making* has been ranked first in its own talent skills and among all thirteen factors.

**Table 3.** Overview Results of the Analysis

Dimension	$\xi^*$	Weight	Rank	Barriers	Local Weight	Rank	Global Weight	Global Rank
Hard	0,152	0,5212	1	S1- Problem solving skills	0,1670	3	0,087	4

<b>Skill s</b>				S2- Technical expertise	0,1299	5	0,068	<b>7</b>
				S3- Cognitive skills	0,1485	4	0,077	<b>6</b>
				S4- Planning & decision-making	0,3465	1	0,181	<b>1</b>
				S5- ICT skills	0,2079	2	0,108	<b>3</b>
				<b>Total</b>	<b>1.0000</b>		<b>0,521</b>	
<b>Soft Skill s</b>	0,013	0,2553	2	S6- Communication skills	0,1189	5	0,030	<b>13</b>
				S7- Interpersonal/social skills	0,1902	3	0,049	<b>10</b>
				S8- Teamwork orientation	0,3171	1	0,081	<b>5</b>
				S9- Adaptability and flexibility	0,1359	4	0,035	<b>12</b>
				S10- Leadership	0,2378	2	0,061	<b>9</b>
				<b>Total</b>	<b>1.0000</b>		<b>0,255</b>	
<b>Mix ed Skill s</b>	0,158	0,2234	3	S11- Creativity and innovation	0,4929	1	0,110	<b>2</b>
				S12- Change management	0,2957	2	0,066	<b>8</b>
				S13- Entrepreneurial skills	0,2112	3	0,047	<b>11</b>
				<b>Total</b>	<b>1.0000</b>		<b>0,223</b>	

In the hard skills category, the other most important talents came out, ICT skills, problem solving skills, cognitive skills and technical expertise respectively. In the soft skills category, the skill ranking is as follows; teamwork orientation, leadership,

interpersonal & social skills, adaptability & flexibility and communication skills. Finally, the ranking of the mixed skills group is creativity and innovation, change management, entrepreneurial skills respectively. A graphical representation of the overall results is presented in Figure 1.

**Figure 1:** Graphical representation of the BWM results



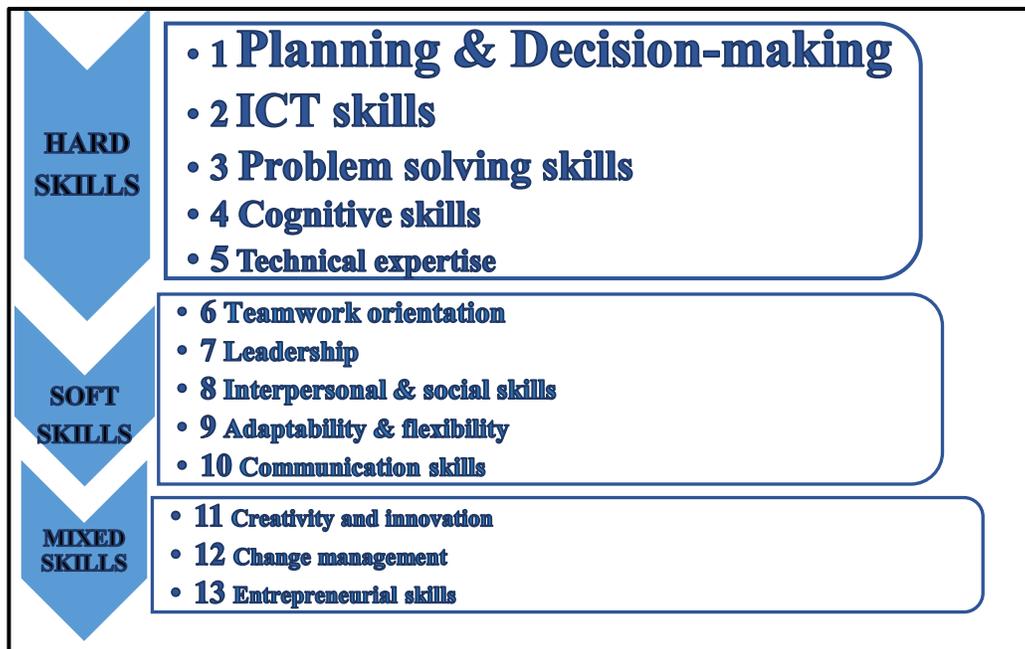
After analyzing the weights of each skill, we should check to what extent the results are reliable. The consistency values of the main skills based on responses should be checked. The Consistency Ratio (CR) of the pairwise comparison data provided by the decision makers must be looked at, in order to see the reliability of each skill weights obtained. If the CR is not bigger than the threshold, the consistency of the comparisons is acceptable. Otherwise, you might ask the DM to revise the pairwise comparisons. These two numbers are valid only when you have entered all input data. As seen in Table 3, consistency values of the hard skills, soft skills and mixed skills are 0,152; 0,013 and 0,158 respectively. There is a high level of consistency for  $\xi$  values close to zero (Rezaei et al., 2018). This means that the closer the  $\xi^*$  to zero is the better, therefore, the reliability of the data and analysis are unproblematic. Almost all values are very close to zero, meaning there is a high consistency of the comparisons and high reliability of the results.

## 7. Conclusion

Technological advancements and the Covid-19 pandemic caused significant disruptions in hospitality labor markets. Additionally, due to the developments in robotics, artificial intelligence, internet of things and social media, hospitality workforce seem to need generating new digital and cognitive skills as well as the interpersonal and social skills (Karaçay, 2018). In other words, it is important for lodging companies to realize and then to prioritize the employee competencies, in terms of talent management. Given the importance of “talent” definition, the concept remains vague, with only a few models proposed in previous literature (Bagheri et al., 2020). Hence, this study aimed to specify and prioritize employee competencies consisting of hard, soft and mixed skills for H4TM in the context of key specialist jobs in lodging industry.

As a result of the data analysis, a graphical representation for proposed H4TM prioritization in lodging sector is presented in Figure 1. To interpret this figure, and to make more clear suggestions for lodging professionals, a priority model is presented in Figure 2.

**Figure 2.** Hospitality 4.0 Talent Management (H4TM) Employee Competencies Priority Model



The current research revealed that “*Planning and decision making*” skill; which briefly comprise of the talent to act strategically and make analytical, effective and

timely decisions when needed (Bharwani and Talib, 2017), is settling at the top of the H4TM priority list. Where the sequent competency in the proposed model is “ICT” skills, it is followed by the “Problem solving” abilities as the third most important talent indicator for lodging sector. Such a gradation might be interpreted with the intangible, fragile and interactive characteristics of lodging services, which need managers taking initiative, using information and communication technologies successfully, making urgent and pursuant decisions and creating effective solutions to unexpected occasions. Therefore, it is strongly recommended to overemphasize the Planning & Decision making, ICT and Problem-solving abilities to the lodging professionals, and to the hospitality students, as well.

In conclusion, this research indicates that lodging sector professionals and students who are planning to work in the lodging sector, had better take abovementioned 13-point priority model seriously, in order to attain key management positions in lodging organizations. It is also recommended to the lodging professionals to expedite their adaptation process in terms of information and communication technologies to keep up with hospitality 4.0 applications that are commonly implemented in lodging facilities, since tourism is a flexible industry adopting the latest technology innovations.

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