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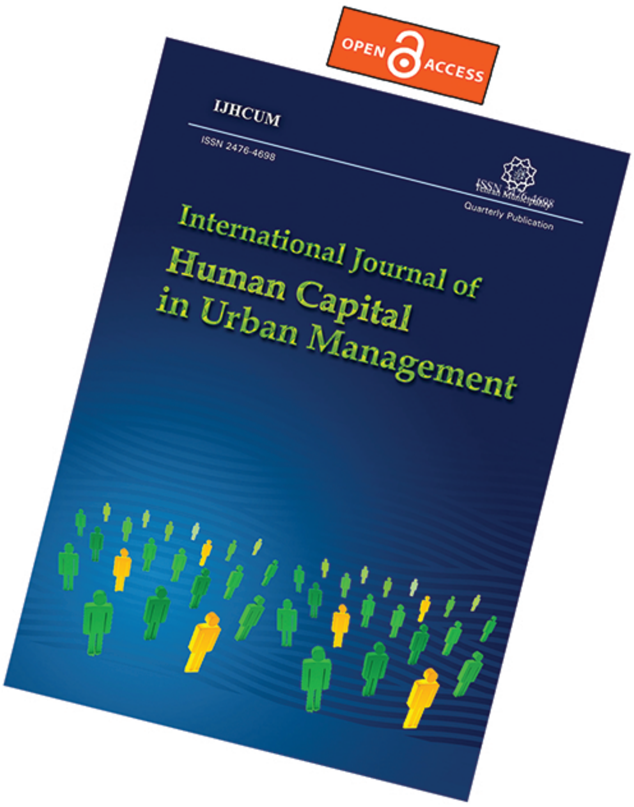

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ORIGINAL RESEARCH PAPER

Environmental management for human communities around wetlands adjacent urban region by ecological risk approach

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ABSTRACT

BACKGROUND AND OBJECTIVES: Human communities encompass significant population proportion via various strategies of livelihood around the wetlands, including urban development, municipal wastewater discharge or solid disposal, construction growth, agriculture, and fishery piers. Wetlands essentially prepare precious biodiversity and are excellently approved as valuable ecosystems; however, have been exposed to destruction and ruin. The most impressive objectives of the research are briefly to improve the wetland ecosystem by highlighting biodiversity protection approaches. In this paper, the whole socio-economic activities, besides the environmental concerns have been probed on the Boujagh Wetland to better figure out the trade-offs with this management practice.
METHODS: Overall, a conceptual integrated management model has been utilized as the framework of the study, afterward identifying hazardous factors, vulnerability, and indicator species threshold, Ecological Risk Assessment has been implemented by Tiered-ERA model; MIKE 21 simulated contaminants in the widespread aquatic area. SWOT and Quantitative Strategic Planning Matrix have been selected for strategy identification and classification, respectively. In order to illustrate sensitive habitats and other features, Geographic Information System and Remote Sensing instruments have been applied.
FINDINGS: Results demonstrated “chemical fertilizers and pesticides of upstream farmlands” and “toxic metals of industrial wastes and boating” led to ecological hazards for organisms; in addition, nitrogen and phosphor parameters affected eutrophication, influenced due to residential effluents. Furthermore, the most sensitive ecosystems are situated on the surrounding Boujagh Wetland and Sefidrud River margin. Conservation and tourism are prioritized as key strategies and wise uses by scores 10.19 and 9.79 on the QSPM respectively.
CONCLUSION: Finally, conservation, extensive tourism, urban wastewater treatment establishment, elimination of chemical fertilizers and pesticide consumption, prevention of boating, especially military maneuvers, and landfill removal have been suggested to restore the Boujagh Wetland instead of countless unaccustomed land uses.

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INTRODUCTION

Wetlands are acknowledged as multifunction ecosystems with significant and valuable potentials to store, purify, and gradually distribute water, which can proscribe floods and provide water for life (Land *et al*., 2016). Most of the wetland functions are related to dominant plant species on it (Saeidi Moshaver *et al.*, 2016). Since 1990 an overwhelming deprivation has occurred. Until at present time, more than half of wetlands worldwide have been converted to farmlands and urban areas (Isunju and Kemp, 2016; Sadreazam Nouri *et al.,* 2021). According to previous studies results, wetlands adjacent to urban have faced excessive pressure due to competitive land requests for urban development and population growth, infrastructure expansion, aquaculture, and urban farming (Kingsford *et al.*, 2016). The concept of “wise utilization” has been adhered to in the Ramsar Convention originally, which is regarded as the main purpose of preserving the ecological features of the wetlands, attained via an ecosystem approach in the perspective of sustainable development (Ostrovskaya *et al.*, 2013). Thus, a comprehensive and accurate management method is required to estimate determinations caused by the human community’s activities, as well as urban, agricultural and industrial development around wetlands, which can solve environmental multifaceted problems of wetland (Eagles-Smith *et al.*, 2016). In this paper, analyzing and integrating management, a conceptual framework has been thoroughly developed through an ecological risk approach, and Boujagh Wetland has been probed as a case study. The framework was elaborated on two main fundamental perceptions. The first was related to the explanation of effective and sufficient management practice, which is certainly inferred from the Ramsar guidelines. The second is debated in superior details of management capacity and the numerous scopes (Ostrovskaya *et al.*, 2013), which are covered by ecological risk assessment (ERA). This special exclusivity is to provide a synthesis of researches on environmental deviations and human impacts on wetlands (Cui *et al.*, 2016). The convention has additional offered a Geographical Information System (GIS)-based manner as a theoretically convenient performance for localizing risks in the wetlands (Sarkar *et al*., 2016). An ERA is a multi-dimension process that depends on all-inclusive data accumulation, integration, and probing of miscellaneous ecological, spatial, socio-cultural, economical, and managerial variables (Malekmohammadi and Blouchi, 2014). Its data should incorporate spatial information, the incidence likelihood, frequency, and intensity of risk related to proximity to human communities and urban (Chaves *et al.*, 2020). Therefore ERA has been known as a proper tool for detailed wetland management. Especially, the ERA is an evaluation of risks related to an ecological hazard and has advocated for the production of meticulous and accurate scientific information. This information can assist planners in reducing environmental pollutions and other damages to the minimum (Sievers *et al*., 2017). ERA argues the probability of loss occurrence of the ecosystem due to exposure to the stressors (Cesen *et al*., 2018). The stressors and chemical substances entered into the wetland and river through effluents and polluted runoffs discharge in the upstreams and expose vital organisms to the risk (Shifflett and Schubauer-Berigan, 2019). ERA inherently involves three important objects “intensity” and “likelihood” of occurrence plus “threshold of receptors”, ERA process can analyze the problem formulation and ecological vulnerabilities, in addition, estimate the probability of irrecoverable detriment to the environment (Jin *et al.*, 2016). Furthermost of the former literature concentrated on a particular characteristic of Boujagh Wetland, for instant wastewater pollution in sensitive areas (Mahdi *et al.*, 2021), effects of Caspian Sea Level (Khoshravan *et al*., 2021), ecotourism (Gourabi and Rad, 2013), geomorphology (Khoshraftar, 2015), vegetation (Maghsoudi *et al.,* 2015), bird species (Ashoori, 2018). Haghani and Leroy (2020) have examined the Sefidrud Delta evolution based on Caspian Sea Level (CSL) fluctuations and stated as a result the consequences of the human are tangible in the delta transmission. However, the effects were concluded for an explicit type of revival performance (e.g., formation of a barrier, harbor, path, or dam) during an explicit time. Spearman *et al*. (2014) demonstrated the probable impact of the port on a coastal habitat and realized that the deposit recycling prevented habitat loss enlargement, and decreased the consequent reactions of the aquatic ecosystem to this interference. Mammides *et al*. (2015) concluded that roads had adverse impacts on four of the five bird groups they considered in Cyprus sites. Madu *et al*. (2018) applied the fish-bone model as a diagnostic analytics tool to categorize the multi-depot spreading and the root causes and effects of lacked oil in the Niger River Delta. Alemi Safaval *et al.* (2018) used GIS and Remote Sensing (RS) as means to clarify the impact of ports and coastal structures built in the Boujagh Wetland region on beach and shoreline morphological changes of shoreline modification recognition using satellite pictures and recommended an innovative method. Kapourchal *et al.* (2014) studied the portion of ecological and socio-economical land uses in Boujagh national park by using GIS and RS; they specified the rigid nature, threatened, extensive, intensive, reclamation, managerial, scientific, and manifold use sectors are included of the total area, respectively. In this regard, GIS and RS can facilitate data analysis and management and illustrate risk levels. Besides, ERA is flexible and simplifies the complicated data of ecosystems and hazards via computational formulas (Liang *et al.*, 2015). In this research, investigating stressors, and forecasting contaminants distribution, the simulation model of MIKE 21 has been undertaken in a combination with the Tier Ecological Risk assessment (TIER) model. Recently, the database of spatial response to natural changes and human impacts in Boujagh National park has been conducted by Karimi et al. (2021). Nevertheless, in this study, MIKE 21 has been applied to pollution simulation and the results have been used in ERA. The most significant porpuses of this research are briefly to improve the wetland ecosystem, and to present a set of sufficient and effective mitigation measures and a management model to solve human-made problems by highlighting biodiversity conservation approaches (Endter-Wada *et al.*, 2020). So, ecological approach has been chosen, not only presents an integrated framework of management, but also regards to details. Reihanian *et al.* (2012) explored the use of altering of tourism in the Boujagh National Park via Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis method. The case study provided a subjective experience of the management method. Boujagh wetland located on Kiashahr city downstream, the north of Iran and Sothern of Caspian Sea shoreline and Sefidrud Delta, within 500 hectares area, is known as the first marine coastal national park protected by Iranian Department of Environment (DOE). Kiashahr is the nearest city to this wetland (Hakimi Abed *et al.*, 2011). The satellite map of Boujagh Wetland and National Park location has been illustrated in fig 1. Boujagh Wetland is one of the first wetlands of the Ramsar Convention (Noroozi, *et al*., 2009). The study area includes the

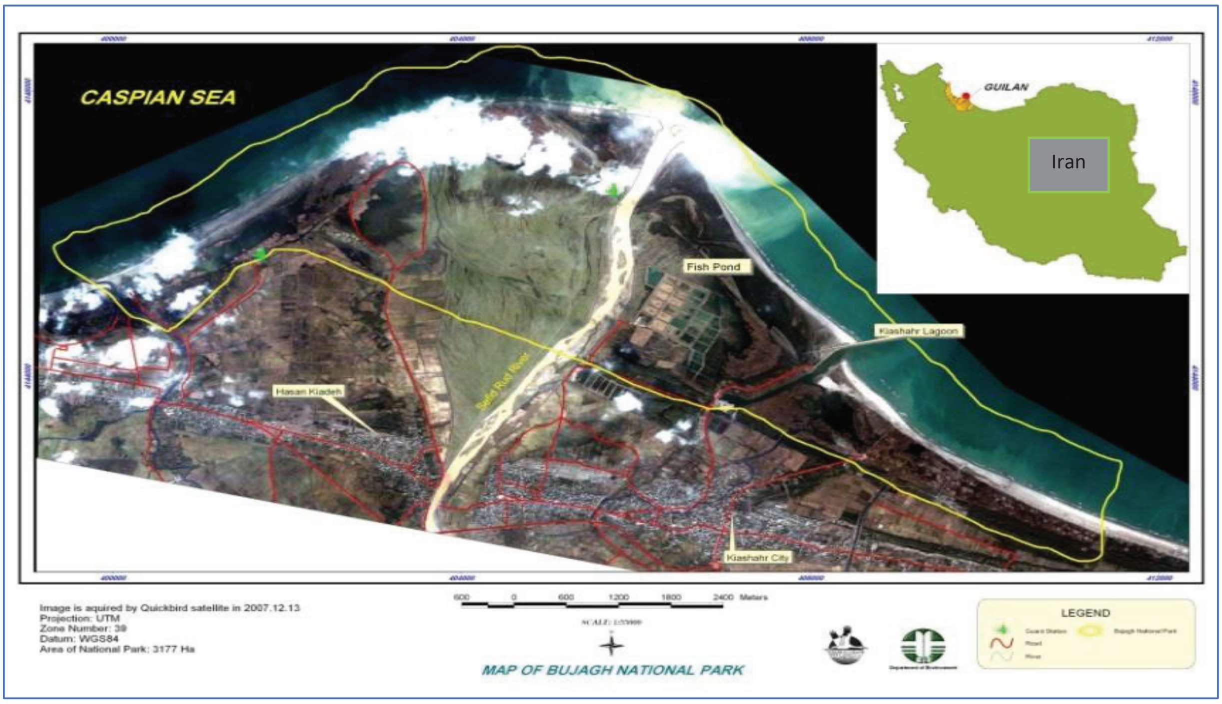

Fig. 1: Geographic location of the study area in Bujagh Wetland and National Park (Alemi safaval *et al*., 2018)

Boujagh National Park and Wetland.

Individual habitats of Boujagh Wetland have attracted precious biodiversity of fauna and flora especially migrated birds during winters (Khoshraftar, 2015). Sefidrud Estuary is a significant habitat for Caspian kutum (*Rutilus frisii kutum*) and sturgeon (*Acipenser spp*.) breeding in the spring (Khara and Nezami Balouchi, 2005), which have played an important role in residents livelihood on the wetland surrounding (Khara *et al*., 2007). The remarkable variety and population of migrated birds, fishes, marine animals, and mammals are representing the ecological capability and efficiency of the region (Esmaeili *et al*., 2014). Unfortunately in recent decades, municipal wastewater pollution, residential solid wastes disposal, chemical fertilizer and pesticides of agriculture, industrial effluents, contaminated run-offs, aquaculture, land use changing, and water taking of Sefidrud on the catchment have threatened the ecosystem (Alemi Safaval *et al*., 2018). The most important stressors have consisted of chemical substances related to agriculture pesticides and fertilizers (eg., nitrogen and phosphor), heavy metals and toxic elements of the residential, hospital, and industrial effluents from the nearby cities and urban areas especially Kiashahr city and other settlements, organic ingredients, and exotic species from aquacultural pounds, fishery, hunting, fuel leakage of boat and military maneuvers, which have faced Boujagh Wetland and its protected animals to the dangers, for example, Caspian seal (*Phoca caspica*), brown trout (Salmo trutta), starry sturgeon (*Acipenser stellatus*) (Khara and Nezami Balouchi, 2005), dalmatian pelican (*Pelecanus crispus*), pygmy cormorant (*Phalacrocorax pygmeus*), white-fronted goose (*Anser albifrons*), red-breasted goose (*Branta ruficollis*), white-tailed eagle (*Haliaeetus albicilla*), swans, ducks, cran, flamingoes, etc. (Ashoori, 2018), amphibians and reptiles. Some of the species are listed by the International Union for Conservation of Nature (IUCN) red list as endangered and vulnerable. Tourism attractions due to the natural features regularly absorb humans to visit the area (Gourabi and Rad, 2013). Even if the biosphere of the wetland was altered, the efforts of wetland conservation should enhance to attain the highest alterations and sustainable development; else overwhelming utilization of natural resources would lead to biodiversity degradation and declining ecosystem balance (Jafari, 2009). It is necessary to mention, the factors of migration to metropolitans, converting farm fields to protected and tourism land use could decline the pressure of population on the study area (Reihanian *et al*., 2012), but then again residential complex development, aquaculture, sand taking, overplant of rice and overusing pesticides are existing (Nasrolahi *et al*., 2017), therefore the comprehensive management framework can play a significant role in wetland restoration and alteration (Grygoruk and Rannow, 2017).

MATERIALS AND METHODS

Overall, a conceptual management model was utilized as a framework of the study, that indeed integrates unique and hybrid methods and potentially categorizes the whole functions of procedures and regards to relations and consequences amongst the different sections (Bratley and Ghoneim, 2018). Consideration of environmental existing conditions was established based on previous studies (Chaves *et al*., 2020). ERA was carried out with the TIER model. In the first step, reviewing the literature of the wetland studies, environmental hazards, threats, and ecological sensitivities are considered and then are categorized through the fish-bone model (Madu *et al*., 2018). To quantify and estimate ecological risks the formulas including Eq. 1 (Liang *et al*., 2016), and Eq. 2 (Cesen *et al*., 2018) are used; TIER is known as a conceptual model which can quantify risks within aquatic ecosystems (Riva *et al*., 2019).

$$HQ= \frac{PEC}{Threshold} \times sensitivity \tag{1}$$

Where; HQ= Hazard Quotients

The threshold is accounted by NOEC or NOEL or LC50 or LD50 it depends on the available amount which has been already examined by valid scientific references) NOEC= No Observed Effect Concentration; NOEL= No Observed Effect Level; LC50= Median Lethal Concentration; or LD50= Median Lethal Dose; amounts of the threshold have been extracted from the United States Environmental Protection Agency agendas (US EPA). LC50 and LD50 scales are the concentration of chemical material that lead to the death of 50% of a group of laboratory test animals at once. These are the manner to measure the short-term poisoning ability (acute toxicity) of a substance

(Riva *et al*., 2019). PEC = Predicted Environmental Concentrations; or the estimated amounts might be available so it is replaced by EEC = Estimated Environmental Concentrations. In this study, the sensitivity of species was likewise considered as the third parameter; so in terms of the IUCN red list, characters involving critical, endangered, and vulnerable species have been assessed in HQ corresponding to Eq. 1. If HQ was less than one it is classified as a very high-risk level (VHL), between 1 and 4 as high (HL), 4 to 7 medium (ML), 7 to 14 low level (LL), and upper than 14 is negligible (NL). To ensure HQ results and reduce uncertainties, Risk Quotient (RQ) was applied to probe the ecological risks posed by the object elements, and RQ was computed using Eq.1 (Cesen *et al*., 2018).

$$RQ = MEC / PNEC \quad (2)$$

MEC corresponds to the maximum perceived concentrations; PNEC or the Predicted No-Effect Concentration was tallied by EC50/LC50, which examined risks in acute and chronic toxicity.

Acute Effects RQ (fish and invertebrates):

1-in-10 Year Peak Water Concentration = RQ most sensitive organism LC50 or EC50

Chronic Exposure RQ (invertebrate):

1-in-10 Year 21-day Average Water Concentration = RQ aquatic invertebrate chronic toxicity NOEC

Chronic exposure RQ (fish):

1-in-10 Year 56-day or 60-day Average Concentration =RQ fish early life stage or full life cycle toxicity NOEC

An RQ that is less than 0.1 ($RQ < 0.1$) is potentially classified as a "Negligible Level" (NL). The value between 0.1 and 0.4 is called "Low Level" (LL), among 0.4 to 0.7 "Medium Level" (ML), about 0.7 to 1 "High Level" (HL), and an RQ that is upper than 1 ($RQ \geq 1$) is entitled as "Very High-risk Level" (VHL) (Cesen *et al*., 2018). Extraction the number of indicators species of the wetland, the sensitivity of organisms has been determined (Chaves *et al*., 2020); by reviewing the ecosystem food chain, some the aquatic organisms have been examined including invertebrates, plants, and fishes (Sattari *et al*., 2019). ERA has been improved through combination with a computational simulation model MIKE 21 FM-ECOLAB which can illustrate how pollutants are released on the wetland and surface waters (Karimi *et al*., 2021). The combination and application of MIKE to show pollutants dispersion are the innovation of this study. MIKE 21 model is a computerized model to evaluate hydrological changes and water flows in Boujagh Wetland (Nasrolahi *et al*., 2017) as well as can consider contamination defusion. Additional sampling information is used as a database in a simulation that the DOE has already done. To assess seasonal variations in Boujagh basin pollution loading, samples of water were collected in spring, summer, autumn, and winter and 12 sample points, from Sefidrud Dam to the downstream. Simulation has been conducted for 4 seasons separately. Extraction results from GIS and RS have adequately been implemented to elucidate MIKE simulation and sensitive areas (risk levels sites) through maps (Malekmohammadi and Blouchi, 2014). Finally, analyzing data, SWOT and Quantitative Strategic Planning Matrix (QSPM) have carried out and the scores were normalized from zero to one. In the first step of SWOT, internal (strengths and threats) and external (opportunities and threats) environmental factors have been estimated in two matrices separately (Pazouki *et al*., 2017). Perusing the factors is a key section of a strategic planning process that is a part of sustainable development (Endter-Wada *et al*., 2020). The internal factors of the wetland were categorized as strengths (S) or weaknesses (W) and those external were summarized as opportunities (O) or threats (T). Accordingly, a set of Ss and Ws and a set of Os and Ts were summed up. The prior was arranged in the Internal Factor Evaluation Matrix (IFEM) and the latter was arranged in the External Factor Evaluation Matrix (EFEM). Following, the factors were scored by a board of specialists and the final weight was counted (Reihanian *et al*., 2012). Subsequently, base on the wetland ecological capability and restoration evolution, prioritized strategies, and management scenarios were suggested (Endter-Wada *et al*., 2020).

RESULTS AND DISCUSSION

According to probe the Boujagh Wetland area, the human activities often weren't compatible with ecological capability. Municipal wastewater discharges, unexpected land use exchanges (for example urban development, land encroachment, construction, agriculture, and aquaculture), improper exploitation (e.g hunting, fishery, sand mining, and harvesting), non-systematic recreation, pier establishment, canoe, military maneuvers, fuel leakage, entering exotic species, and solid waste disposal have been subtracted as significant reasons for ecological risks in the area. Using the fish-bone model is categorized main causes and effects of risks in the Boujagh wetland area, which has illustrated in Fig 2.

Assessing dispersion scope and effects of water pollutants, has been conducted by MIKE 21, the inputs of the model are sampling results, bathymetry, and water flow, and also the outputs are maps of two-dimensional distribution simulation of pollutants on the wetland surface and river on the basin. Nitrogen and phosphor parameters are index stressor factors of eutrophication and Dissolved Oxygen (DO) decrease meant which is directly related to effluents and causes stress to the ecosystem, benthos, and terrestrial and aquatic animals and plants. A drawing of pollutants simulation of DO, Biological Oxygen Demand (BOD), Nitrate (NO_3^{-2}), and Phosphate (PO_4^{3-}) on Boujagh Wetland and Sefidrud River has been shown in Figs. 3 to 6 respectively, during winter with a report of peak presence of immigrant birds and endangered species. Heavy metals concentrations haven't regularly been stated on the sampling report hence the simulation wasn't provided. However, coliforms Escherichia coli (E.coli) and Total coliforms (T.coli) have been stated which demonstrates residential sewages could influence the wetland.

According to the ERA framework, some individual species have been judiciously chosen, and then HQ has been precisely estimated for each indicator separately. Amongst bird species, the mallard has approximately existed in the whole sections of

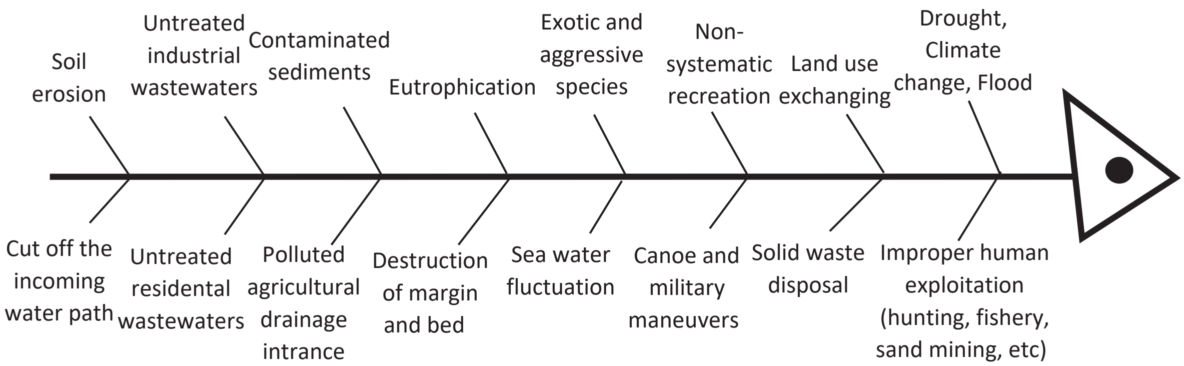

Fig. 2: The fish-bone model of anthropoid hazards causes and effects of Boujagh Wetland

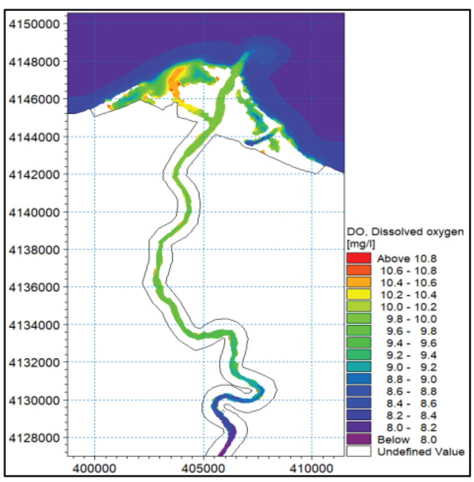

Fig. 3: DO fluctuations tendency

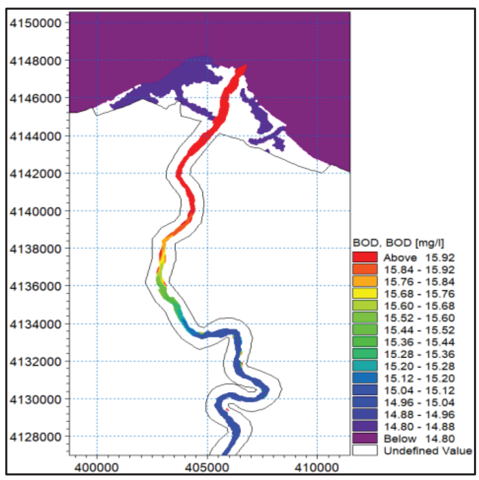

Fig. 4: BOD fluctuations tendency

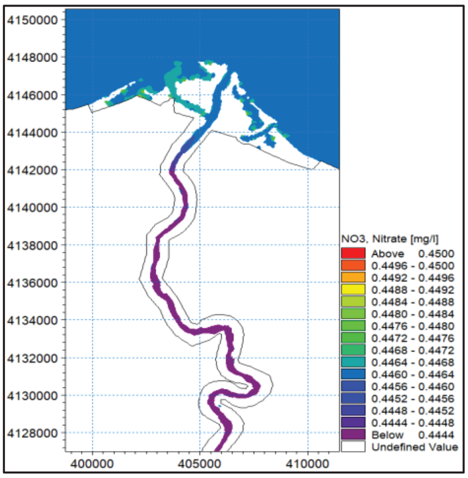

Fig. 5: Nitrate (NO_3^{2-}) fluctuations tendency

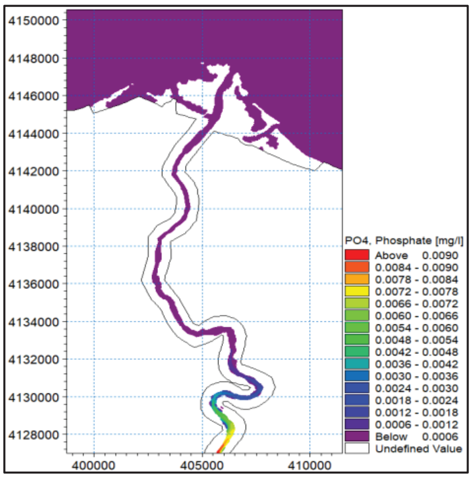

Fig. 6: Phosphate fluctuations tendency

Table 1: ecological risk characterization and receptors sensivities by using TIER

Species	LC50	LD50	HQ	RQ	Risk level	Risk magement is required
Caspian hydrothermal fish (Carp, Kora vobla, and Southern Caspian kutum)	8000 mg/L (in 96 hours exposure)	50 mg/L	2.3	0.87	HL	Manage to prevent mortality and natural population reduction
Caspian cold fish (trout and salmon)	5300 mg/L (in 96 hours exposure)	0.5, 5, and 50 mg/L	0.94	1.32	VHL	For high ecological sensitivity, especially red-spotted trout, manage to prevent mortality and natural population reduction
Starry sturgeon	6000 mg/L (in 96 hours exposure)	0.5, 5, and 50 mg/L	0.94	1.67	VHL	High ecological sensitivity, manage to prevent mortality
Kilka fish	5300 mg/L (in 96 hours exposure)	5 mg/L	2.3	0.75	HL	manage to prevent mortality and population reduction
Aquatic benthoses and macroinvertebrates	3.8 mg/L (in 48 hours exposure)	48 mg/L	6.2	0.79	ML	Manage by reducing the concentration of phosphor and carbon in sediments during time
Aquatic plants	4.6	67-93% 1hlorophyll production reduction in 1 mg/L	5.2	0.82	ML	Manage carbon and phosphor concentration in sediments and dissolved nitrogen, by preventing the loss of sediments

the wetland area, were prioritized on ML; still, the sensitive species such as chlorophyll pelican with a less population density, larger physique, and vulnerable (near threatened) status in IUCN red list, were categorized on HL. Birds, mammals, and reptile species due to aquatics nourishing were exposed to oral risks; depending on ecotoxic effects and a degree in the body tissue of organisms, risk characterized to acute and chronic. Thus, HQ was calculated for pioneer species of former levels of the food chain in the aquatic ecosystem (Table 1).

Eventually, overlapping and integrating environmentally sensitive areas in the study area and the hazards and threats in the area and land use and human activities that have exposed the wetland, the environmental risk zoning map was drawn as shown in Fig. 7.

To improve the condition of the Boujagh Wetland, management strategies were determined and proposed through the SWOT method. For this purpose, at first, the Strengths (S) and Weaknesses (W) of the wetland (internal factors) and also the Opportunities

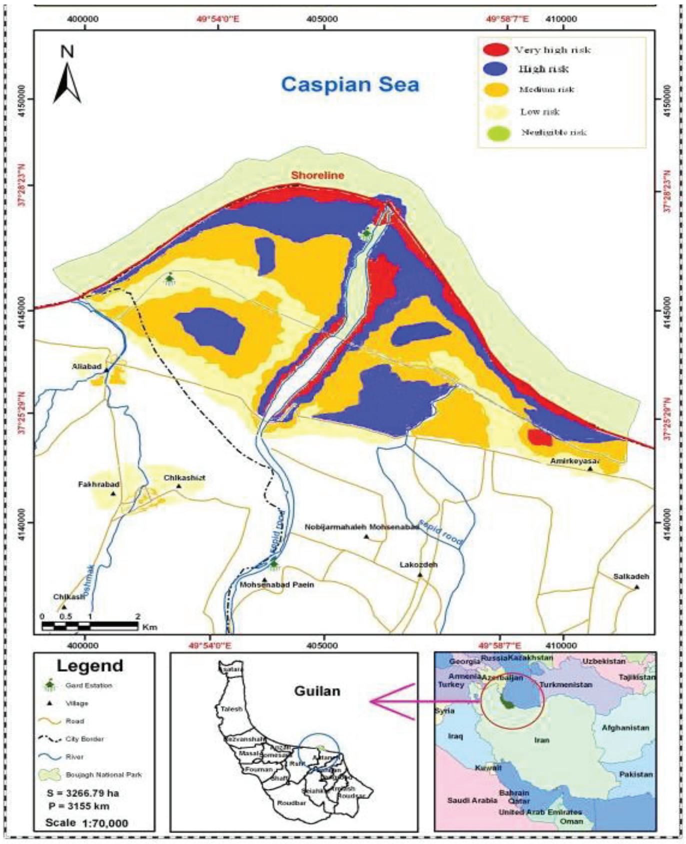

Fig. 7: The performed environmental risk zoning for Boujagh Wetland area

(O) and Threats (T) caused by human activities in the wetland (external factors) as well as the risks arising from externals on the structure and function of the wetland were determined and prioritized. Tables 2 and 3 summarized the outcome of internal and external factors prioritization, respectively. Regarding the obtained results, the value of IFEM equaled 2.37 (less than 2.5), which meant the strengths were less than weaknesses; and also the final score of EFEM was 2.43 (less than 2.5), so the opportunities were less than threats. It can be concluded the current state of management is suffering and the wetland has gone ahead to a hardship situation and might be recorded to the Montreux blacklist.

According to the results of the strategy analysis by SWOT, sustainable conservation, recreation, and restoration are the substantial pivot of the wetland environmental management. To acquire those, by pair conforming S, W, O, and T, forty-two crucial strategies were determined for the wetland. SO strategies offered opportunities that apt well with the wetland area strengths. Plus, WO strategies suggest opportunities to overcome weaknesses. ST strategies distinguish the solution that can be used to decrease susceptibility to threats. WT strategies were determined a defensive plan avoiding the wetland weaknesses for creating it extremely vulnerable relative to threats (Fig. 8).

Based on the scoring results in the QSPM matrix, management strategies are prioritized and quantified as described in Table 4.

Regarding the results, identifying where Boujagh Wetland management can support risk reduction is essential for assisting decisions, integrated management, and conservation. The risk analysis can provide decision-making tools for the prioritization of conservation strategies which are categorized in the first grade; it means the Boujagh Wetland was exposed to urban development, hazardous human activities, and illogical utilization, which caused the wetland degradation. Furthermore, spatial urban development has resulted in the intake of more agricultural lands and forest depletion of numerous circumstances. The concerns are particularly more apparent in the urban areas adjacent to the coastal area and river margin. Inappropriate schemes of land exploitation, wood smuggling, and pastures overgrazing in height above sea level have led to numerous risks in recent decades. The disturbances of natural habitats, over fishery, and excess hunting are other main environmental hazards in Boujagh Wetland. Additional meaningful hazardous of urban

Table 2: IFEM of environmental management of Boujagh Wetland area

Internal environmental factors	Code	Score	Weight	Total Score
Strengths				
Individual ecosystems, breeding habitats, and desirable bio-geography	S_1	4	0.035	0.14
Conservation of valuable endemic and individual species	S_2	2	0.029	0.05
Significant diversity of plant species, aquatic animals, birds, marine mammals, existence of endangered and threatened species	S_3	3	0.024	0.07
Suitable and fertilized soil with little erosion in some parts	S_4	3	0.031	0.09
Significant capabilities to attract tourism	S_5	3	0.023	0.07
Primary infrastructures such as power network	S_6	3	0.025	0.08
Sand dunes and grasslands in the wetland area, flood controlling and diversity of landscape	S_7	2	0.025	0.05
The economic value of wetland habitats (estuary, beach, …)	S_8	3	0.033	0.09
Distribution of wetland habitats in the study area	S_9	2	0.030	0.06
Attractive and natural landscapes with natural aesthetics, recreational space, and bird watching	S_{10}	3	0.022	0.07
Active and educated inhabitants to participate in conservation and tourism plans	S_{11}	3	0.023	0.07
Striking capability of research, training, and study inherently	S_{12}	3	0.022	0.06
Natural resources affecting the livelihood of the locals and inhabitants	S_{13}	4	0.032	0.12
Active Environmental NGOs presence	S_{14}	4	0.032	0.13
DOE inspection, Park rangers presence, and Ramsar convention limitation	S_{15}	2	0.030	0.06
Weakness				
Sedimentation and settlement on Sefidrud River estuary	W_1	3	0.023	0.07
The loss of plant species and destruction of some parts of grasslands by overgrazing	W_2	4	0.025	0.10
Lack of belonging sense among stakeholders towards protection and sustainable productivity	W_3	4	0.021	0.08
Lack of improper planning and infrastructure for tourism	W_4	4	0.022	0.09
Soil erosion due to torrential rain especially on spring and river margin	W_5	3	0.010	0.03
Occupational attraction shortage for locals and lack of long-term planning	W_6	3	0.021	0.06
land encroachment and inconsiderate exploitation	W_7	3	0.012	0.04
Local organized group absence on Boujagh Wetland margin	W_8	3	0.015	0.04
Lack of proper relation between non-governmental organizations, stakeholders, and managers	W_9	3	0.018	0.06
Lack of proper system for solid waste management and disposal	W_{10}	4	0.020	0.08
Extraordinary destruction in some parts of the wetland area due to reed and plant harvesting	W_{11}	4	0.020	0.08
Polluted sediments and water entrance to the wetland	W_{12}	3	0.016	0.05
Absence of executive warranty for preventing illegal hunting and fishing	W_{13}	2	0.014	0.03
Disorganized areas and unknown potentials of recreation	W_{14}	3	0.006	0.02
The shortage of public awareness locally to protect natural resources	W_{15}	2	0.012	0.02
Incompatibility of land uses and ecological capability	W_{16}	3	0.013	0.04
Absence of training and research use	W_{17}	3	0.014	0.04
Absence of acquaintance of experts, planners, and managers about participation techniques	W_{18}	3	0.022	0.07
Livelihood problems for locals and handcraft manufacturers	W_{19}	3	0.018	0.05
The weakness of management about conservation of sensitive areas and enhancement	W_{20}	3	0.014	0.04
Lack of wastewater treatment network and system	W_{21}	3	0.014	0.04
Sum	-	-		2.37

Table 3: EFEM of environmental management of Boujagh Wetland area

Enternal environmental factors	Code	Score	Weight	Total Score
Opportunities				
Annual birds migration route	O_1	4	0.023	0.10
Villages around the wetland with attractive traditional culture for tourism	O_2	3	0.027	0.08
Abundant precipitation in the region	O_3	3	0.025	0.07
Alignment of Sefidrud River and Boujagh Wetland	O_4	3	0.026	0.07
Seashore proximity	O_5	3	0.021	0.06
Environmental NGOs undertakings in the area	O_6	3	0.019	0.06
A guesthouse in the eastern part of the national park	O_7	3	0.018	0.05
Kiashahr port improvement plan in 40-50 hectares area in the eastern during 20 years	O_8	3	0.028	0.08
Strict laws of the national park and international wetlands for criminal land use exchanging	O_9	3	0.021	0.06
Iranian wetland conservation project and ongoing management agenda	O_{10}	3	0.024	0.07
The shortage of access road and ways	O_{11}	3	0.020	0.06
Soil fertility by bird's residues or excrement in surrounding areas and farmlands	O_{12}	3	0.025	0.07
Restrictive laws about the illogical exploration of the wetland and feasible wise use establishment	O_{13}	3	0.028	0.09
Possibility of renewable energy using	O_{14}	3	0.021	0.06
Aquaculture pounds for economic improvement and employment	O_{15}	3	0.022	0.06
Universities studies on Boujagh Wetland	O_{16}	3	0.024	0.07
Individual landscape and widespread perspective of the area	O_{17}	3	0.021	0.06
Register the wetland on Ramsar Site	O_{18}	3	0.029	0.09
Fundamental investing in training and researching about the wetland concerns and issues	O_{19}	3	0.024	0.07
Threat				
Polluting Sefidrud River at the upstream through effluents and wastewater and discharge into the wetland	T_1	4	0.019	0.08
Soil erosion at the wetland coast and river margin in addition transfer massive sediments into the wetland	T_2	3	0.010	0.03
Overgrazing around the wetland grasslands	T_3	3	0.008	0.02
An urban landfill in the eastern of the study area	T_4	3	0.012	0.04
Boating and fishing performances in the wetland	T_5	3	0.012	0.04
Exotic species entrance into the wetland	T_6	3	0.012	0.04
Urban development, land encroachment and residential complex construction around the wetland	T_7	3	0.015	0.05
Destruction of individual habitats and natural ecosystems	T_8	4	0.014	0.06
Aquaculture ponds in the wetland and Sefidrud River	T_9	3	0.016	0.05
Garrison and military maneuvers direction in the wetland area	T_{10}	4	0.017	0.07
Vicinity to the fishery pier	T_{11}	2	0.007	0.01
Unmatchable financial resources with the wetland conservation and restoration requirements	T_{12}	3	0.017	0.05
Motorcycle track in the area	T_{13}	3	0.014	0.04
Incompatibility of land use development without legal and conservation considerations	T_{14}	4	0.016	0.06
Soil compaction and flora dissipation	T_{15}	3	0.019	0.06
Overexploitation related to economic operations and Incompatible with the ecological capability	T_{16}	4	0.020	0.08
Continuing to the various restrictions and probability to recording the wetland on the Montreux's Blacklist	T_{17}	3	0.012	0.04
Visual disturbance and unmatchable landscape with the nature for changing the old texture of buildings	T_{18}	3	0.018	0.05
Illegal hunting and fishing, out of the wildlife resistance power	T_{19}	3	0.015	0.05
Agriculture Development in the upstream and the wetland margin	T_{20}	3	0.014	0.04
Public participation obstacles, lack of appropriate relation between governmental organizations, stakeholders, and private sectors	T_{21}	3	0.011	0.03
The economic poverty of the local communities	T_{22}	3	0.019	0.06
Plain and facile accessibility to the wetland region	T_{23}	4	0.007	0.03
Sum	-	-		2.43

Table 4: Strategies prioritization and quantification on QSPM matrix

Rank	Strategy description	Final Score	Rank	Strategy description	Final Score
1	Using the applied conservation of the wetland and hazardous factors elimination gradually	10.19	2	Implementing conservation management plan for Boujagh Wetland according to the national wetlands conservation plan	9.79
3	Financially supporting for wetland restoration	9.56	4	Planning for the wetland exploitation by ecotourism approach and biodiversity conservation	9.51
5	Developing compatible activities with the wetland ecological capability to protect the area	9.22	6	Allocation of the wetland environmental water right	9.12
7	Ecotourism development in the site in accordance with ecological capabilities	8.85	8	Planning for a thorough and continuous inspection for the wetland and biodiversity conservation	8.81
9	Developing sustainable tourism and following international wetland standards	8.66	10	Protecting the wetland hydrological and ecological boundaries and preventing land encroachment	8.56
11	Preventing land use development and all the activities incompatible with ecological capabilities through regulations	8.46	12	Defining economical activities based on long term planning for wise use	8.20
13	Controlling entered polluted water and sediments mass to the wetland upstream and margin	8.04	14	Encouraging researching and training endeavors and using the results on management	7.96
15	Determining the conversational wetland policies and targeting for long term	7.87	16	Providing satisfactory habitats for migrated birds and preventing site destruction	7.85
17	Strengthening infrastructure relevant to sustainable tourism in the wetland area	7.63	18	Watershed management and soil conservation in the catchment area	7.59
19	Providing financial resources through tourism for the wetland restoration	7.57	20	Using biocontrol in agriculture and aquaculture rather than chemical pesticides in the basin	7.55
21	Planing wastewater treatment system and coordinating between Kiashahr municipality and local government water authorities	7.50	22	Creating job opportunities for locals especially young people by the ecological values and protection objectives and public awareness	7.43
23	Manipulating public participation programs and holding training workshops in Boujagh site	7.42	24	Providing solid waste management plan and separation at the source in the site of the national park and wetland	7.36
25	Improving the ranger station of the park in the wetland and organizing a work structure by a conservation approach and avoiding destruction	7.25	26	Prevention of military maneuver and unnecessary boating with strict laws about international wetland and national park	7.14
27	Persuading and creating a sense of belonging to the wetland for all the stakeholders and users through the principal planning such as tourism, holding sport and leisure tournaments on permitted seasons, training, and public declaration	7.13	28	Forbidding solid wastes disposal in environmentally sensitive areas, and finding new sites for Kiashahr landfill	7.11
29	Getting an opportunity to rehabilitate the wetland by using protective management method such as habitats treatment and stopping operation	7.08	30	Training and awareness to local experts and stakeholders about the wetland values and wise use	7.04
31	Controlling entered flood and sediments mass to the wetland from upstream and Sefidrud River catchment and dam	6.95	32	Appealing environmentalists, actors, famous persons, and athletes to supporting Boujagh Wetland and preventing the destruction	6.92
33	Determining sustainable incomes for locals in terms of the wetland ecological capabilities and renovating current occupations with sustainable livelihood manners eg. Handcraft, participation, tourism, etc.	6.78	34	Using public participation, young workforce, and women for conservation, restoration, and ecotourism development in the wetland	6.68
35	Training and announcing inhabitants, expert, NGOs, and tourism for the wetland protection and biodiversity	6.64	36	Developing scientific research in the wetland site	62.6
37	Studying the wetland benthos and updating biodiversity database in the area	6.58	38	Advertising ecotourism and providing financial sources on the wetland conservation	6.42
39	Public participation and determining the role of young people and women in management, conservation, and recreation of the wetland	6.39	40	Using NGOs abilities to public and stakeholders awareness	6.35
41	Planning for handcraft and traditional arts development	6.11	42	Creating the tools for tourism and using natural attractions eg. Bird watching station, the wetland museum in the park ranger building	5.59

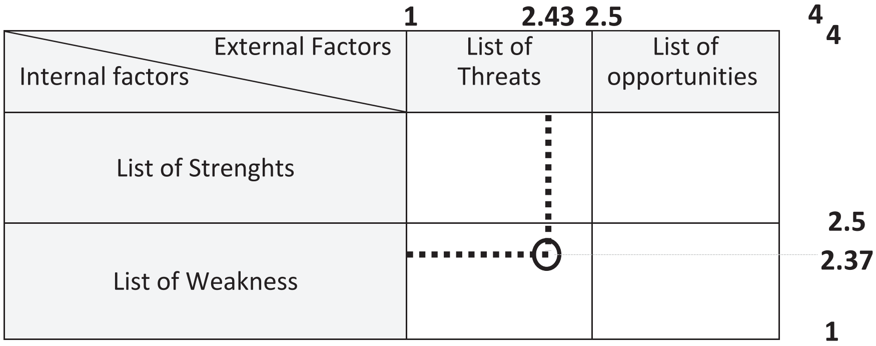

Fig. 8: Strategy characterization of Boujagh Wetland

near Boujagh Wetland has been the municipal wastewater and solid wastes coming to the basin area. The water quality degradation in the natural breeding areas for sturgeon and trout species, eutrophication, and threats to the benthos or other aquatics are significant risks. Causes of the problems have been associated with human activities increased such as the Sefidrud Dam, pollution of the Sefidrud River, vehicle traffic around the wetland, boating, fossil fuel leakage (to the water or margin), construction, and sand mining. So, restoration and conservation of the wetland are necessary to survive the wetland. In terms of ecological capabilities evaluation of Boujagh Wetland, management strategies have been described in three axles containing conservation, restoration, and sustainable recreation. Conservation strategies such as "Using the applied conservation of the wetland and hazardous factors elimination gradually" with a 10.19 score and "implementing a conservation management plan for Boujagh Wetland according to the national wetlands conservation plan" with 9.79 scores are the most important suggested strategies. In the next grade, "financially supporting for the wetland restoration" and "planning for the wetland exploitation by ecotourism approach and biodiversity conservation" with 9.56 and 9.51 scores are ranked respectively. In addition, unexpected land uses around the wetland were known at a high-risk level. Therefore, the strategy "developing compatible activities with the wetland ecological capability to protect the area" (with a 9.22 score) is prioritized in 5th grade. "Allocation of the wetland environmental water right" is a significant strategy that is rated on the 6th rank with a 9.12 score. "Sustainable ecotourism development in the site in accordance with ecological capabilities" (with an 8.85 score) is the 7th prioritized strategy for wetland wise use. Whereas, eliminating incompatible environmental factors and hazardous land uses are accounted urgent requirements, most probably; it will be quickly tabloid the suggested strategies and procedures of wise utilization, for instant stabilizing effective sewage treatment system for residential areas specially Kiashahr, prohibiting the straight discharge of the residential effluents and untreated industrial runoff into Sefidrud River, improving the current wastes collection in Kiashahr, villages, and tourist spots, recycling of persistent wastes and launching compost installations for carbon-based and disposable ingredients, modification of urban expansion and construction policies, control land encroachment, preventing navy maneuvers, effective measures to be taken versus the proscribed fishing, criminal hunting, overgrazing and forest destruction, eliminating chemical pesticides and using biocontrol methods, and watershed management in the upstream. Sustainable tourist activity is assessed as appropriate use, which is close to the ecological potential evaluation and wetland conservation programs. One of the most important techniques of the wetland wisdom use is sustainable recreation; therefore the managerial strategies have been defined such as financial resource providing, training, public awareness, using local workforce, and stakeholder participation, introducing traditional culture, and Strengthening tourist infrastructures and tools. Concluding the results, the three main groups of strategies have been localized on the Boujagh national park and wetland area (Fig. 9). A protection strategy has been suggested on the areas, as shown by orange color and required to strick conservation.

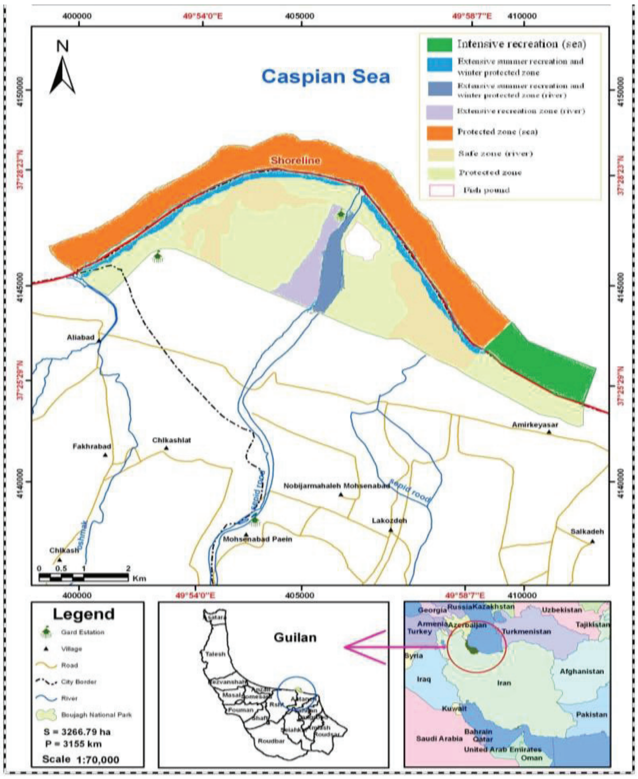

Fig. 9: Zoning of key environmental management strategies of Boujagh Wetland

According to the wetland and river margins classes as the most sensitive area, conservation and extensive ecotourism have been suggested for those areas. The areas with pale green color indicate that the conservation strategy is dominant.

CONCLUSION

In the present study, has been shown, Boujagh Wetland is one of the most valuable ecosystems, which requires an enhanced management framework and sustainable conservation, restoration, ecotourism, and adopted socio-economic activities, which are called “wise use”. It displayed wise exploitation neither preserves and sustains the area nor benefits the communities around the wetland especially Kiashahr City. Thus, Boujagh Wetland is in despairing requirement of an integrated environmental management plan to produce profits for inhabitants and mitigate the adverse effects of utilizations. Therefore, all the aspects of environmental management have been considered, in this paper. For this purpose, deductive and inductive approaches have been taken in the management method. The framework encompasses five basic steps the problem formulation, identification of hazardous activities, risk estimation, management and reducing risks, and improve the wetland condition. Using TIER, MIKE 21, and HQ quantitative formula, ecological risk assessment has been conducted. Determining indicator species threshold, the value of LC50 and LD50 have been extracted EPA documents. Applying GIS and RS have been localized risk levels in the wetland area. In the end, IFEM, EFEM, and SWOT have been used to analyzing data and presenting strategies; in addition, the QSPM has been used to prioritize the key strategies. In conclusion, the management strategies have been recommended to alter the wetland and wise uses. Furthermore, public and stakeholder participation and awareness have been suggested to enhance environmental management. Also, preventing incompatible land uses has been offered coordination between Kiashahr municipality and Gilan province DOE.

AUTHOR CONTRIBUTIONS

N. Mohebbi performed the literature review, experimental design, analyzed and interpreted the data. J. Nouri prepared the manuscript text and manuscript edition. N. Khorasani revised the wetland data and literature review, B. Riazi helped in the literature review and wetland subject revision.

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CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. In addition, ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

ABBREVIATIONS

%	Percent
AHP	Analytical Hierarchy Process
BOD	Biological Oxygen Demand
COD	Chemical Oxygen Demand (BOD)
CSL	Caspian Sea Level
DEM	Digital Elevation Map
DO	Dissolved Oxygen
DOE	Iranian Deparment of Environment
EC	Expert Choice
E.coli	Escherichia coli
EEC	Estimated Environmental Concentrations
EFEM	External Factor Evaluation Matrix
EI	Environmental Indicators
Eq	Equation
ERA	Ecological Risk Assessment
GIS	Geographic Information System
HL	High Level of risk
HQ	Hazard Quotient
IFEM	Internal Factor Evaluation Matrix
IMM	Integrated Management Model
IUCN	The International Union for Conservation of Nature
LC50	Median Lethal Concentration
LD50	Median Lethal Dose
LL	Low level of risk
MCDM	Multi-criteria decision Making
ML	Medium Level of risk
NGOs	Non-Governmental Organizations
NL	Negligible level of risk
O	Opportunities
PEC	Predicted Environmental Concentrations
QSPM	Quantitative Strategic Planning Matrix
RS	Remote sensing
RQ	Risk Quotient
S	Strengths
SO	Strengths and Opportunities strategies

ST	Strengths and Threats strategies
SWOT	Strengths, Weaknesses, Opportunities, Threats (Strategic Environmental Management)
T	Threats
T.coli	Total coliforms
TIER	Tiered Ecological Risk assessment model
US EPA	United States Environmental Protection Agency
VHL	Very High Level of risk
W	Weaknesses
WO	Weaknesses and Opportunities strategies
WT	Weaknesses and Threats strategies

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ORIGINAL RESEARCH PAPER

The impact of the COVID-19 pandemic on the intellectual labor market

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ABSTRACT

BACKGROUND AND OBJECTIVES: The impact of the COVID-19 pandemic on labor markets are extensive. One of the few labor sectors where demand has exceeded supply as a result of the impact of the pandemic is the intellectual labor market. It is explained by two factors. First, intellectual work is the engine for scientific and technological progress, which helps to overcome the crisis. And, secondly, in most cases, such employees can work at home.
METHODS: The "loosened rock" method, factor analysis were used to determine the factors influencing supply and demand in the labor market before and after the COVID-19 pandemic in Ukraine. STATISTICA software (version 13.0) was used to conduct all the analyses.
FINDINGS: The results showed that the demand on the labor market is affected by 3 factors: the number of implemented scientific-innovative developments (dispersion 65.93%), the volume of their financing (dispersion 12.19%), and the level of their legal protection (dispersion 11.13%). Supply depends as well on three factors: the potential volume of scientific developments in Ukraine (the dispersion of 48.61%), the number of employees engaged in intellectual labor (the dispersion of 24.79%), and the level of qualitative supply of executors of scientific-innovative developments (the dispersion of 14.23%). The monitoring of supply and demand in the market of intellectual labor showed that there was an excess of supply over demand (by 13%) before the pandemic COVID-19, and there was an excess of demand (by 20%) after the pandemic COVID-19.
CONCLUSION: These results can provide employers with important information to optimize the organization and planning of intellectual work, which will help to resolve the conflict between the possible consequences of the COVID-19 pandemic and scientific and technological progress, may be applicable in Ukraine and other countries.

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INTRODUCTION

The year 2020 brought forth the unprecedented changes in the global economy and in the world of work (Tayyebirad and Vakil, 2020; Shcherbak *et al.*, 2021). On March 11, 2020, the World Health Organization declared the outbreak of a new coronavirus as a pandemic, calling on governments around the world to get ready for the first wave of emergency condition in health care through a series of transformative measures, one of which in many countries was a universal lockdown (stay-at-home restrictions) (WHO, 2020). Approximately 2.7 billion people (80% of the world's working age population) (Alanezi and Alanzi, 2020) experienced the impact ofthe COVID-19 pandemic restrictions. Employers have had to take into considerationthe structural features of demand that are determined by a country's epidemiological situation, to be prepared for possible new waves of the epidemic and their consequences, such as those that recently occurred in Japan, Singapore, and South Korea (Baker *et al.*, 2020; Barbosa *et al.*, 2020). Most companies that were able to use new work practices in as short a time as possible could not only protect lives and health of people, but also to prevent irreversible damage to the economy (Bendau *et al.*, 2020). Social distancing measures - school closures, airline shutdowns, no meetings, and workplace closures - have been one of the primary anti-coronavirus measures and a means of its spread retardation (Buckee *et al.*, 2020). The number of part-time and full-time remote workers has gradually increased in recent years (Chan, 2009; Fatoki, 2011; Ganushchak-Efimenko *et al.*, 2018). The pandemic has certainly accelerated employers' acceptance of the remote work format (Davis *et al.*, 2020). In a pandemic situation, remote work has proved itself as an important factor to ensure continuity of business (Andreeva and Garanina, 2017; Appuhami, 2007). Meanwhile, under normal conditions, its advantages include reduced commuting time, the ability to focus on work tasks away from office distractions, and finding an optimal work-life balance (Chitsaz *et al.*, 2019; Ganotakis, 2010; Hasbullah, 2006). Remote mode offers greater freedom to choose work schedules as well as alternative work locations outside of the employer's premises (Mushrel, 2014; Portes, 1998). Before the pandemic, only a small proportion of employees worked remotely from time to time (Intarakumnerd *et al.*, 2002; Mayo, 2002). In the European Union (EU), the prevalence of regular or occasional telecommuting (home-based and mobile work combined) ranged from 30 percent or more in Denmark, the Netherlands, and Sweden to 10 percent or less in the Czech Republic, Greece, Italy, and Poland (Ngatno and Apriatni, 2016). According to various studies, up to 20 percent of the labor force in the United States worked on a regular basis or occasionally from home or another alternative location, in Japan 16 percent, and in Argentina only 1.6 percent (Pena, 2002). Thus, in most countries the labor market is undergoing structural changes (Yli-Renko *et al.*, 2001). New forms of work organization and employment coexist with traditional forms of employment (Okafor, 2012). New forms of employment first appeared in high-income countries, but at present time have spread to developing countries (Pittaway *et al.*, 2004). They are characterized by very short contracts, mediation through digital platforms, and changes in work organization (Roxas, 2008). Some of these changes are as well related to a redefinition of working relationships, especially in terms of forms of employment on the line of employment and self-employment (Salamzadeh *et al.*, 2019). The COVID-19 pandemic has shown the increasing ability of companies and employees to be engaged in economic activity remotely (Ethelbhert *et al.*, 2020; Kozlovskyi *et al.,* 2020). While the global community places reliance upon the recovery from the COVID-19 pandemic, new questions arise regarding the long-term impact of the pandemic on the quality of employment and the prevalence of various forms of employment (Gupta *et al.*, 2020). The emergence and growth of new forms of employment are related to two long-term economic trends: digitalization and globalization of value chains (Shiu, 2006). Both trends, as a result of the impact of the COVID-19 pandemic, have delivered benefits to businesses and employees to some extent (Kahn, 2020). Allocating strategically their operations in different jurisdictions, companies can optimize production processes and gain access to local pools of specialized knowledge and skills (Tsai, 2006). Algorithms and digital platforms can also improve businesses' ability to forecast demand and optimize the fitness of employees to tasks in time and space (Van Geenhuizen and Indarti, 2005). Some companies that invest in digital technology pay higher wages (Voydanoff, 2001), and digital platforms create employment opportunities abroad

(Kraemer *et al.*, 2020). Besides, many new forms of employment are actualized remotely and can create opportunities for groups who have limited mobility due to health conditions or responsibilities related to aftercare (Keutzer and Simonsson, 2020). New forms of employment, especially the ability to work on digital platforms, offer improved opportunities for specific types of work such as intellectual work, where individualized schedules can significantly improve the quality of outcomes (Means *et al.*, 2020). The purpose of the article is to determine the extent to which the COVID-19 pandemic affects the level of digitalization of the intellectual labor market in Ukraine. The study was conducted on the basis of statistical data of Ukrainian enterprises in 2020.

MATERIALS AND METHODS

Survey design and data collection

The problem the research is aimed at solving is the necessity to determine the degree of impact of the COVID-19 pandemic on the intellectual labor market. The methodology of the research consists of the following actions: construction of the “loosened rock” graph, factor analysis, construction of supply and demand models in the intellectual labor market, monitoring of changes in supply and demand in the intellectual labor market as a result of the COVID-19 pandemic. The first stage includes using the method of “loosened rock”, where the number of factors that influence the supply and demand in the labor market is determined by means of the point of sharp fall of the broken line slope). The second stage includes a factor analysis. Using this method, we have identified the most significant factors and their constituent indicators affecting the level of supply and demand in the intellectual labor market (Hair *et al.*, 2010). STATISTICA software is used to conduct factor analysis. Theoretically, the dependence of supply or demand on the identified indicators is described as follows (Eq. 1):

$$Y_{dem} / Y_{sup} = \sum_{j=1}^{N} F_j \qquad (1)$$

Where Y_{dem} - demand for intellectual labor; Y_{sup} - supply of intellectual labor; F_j - j-th factor; N - number of factors identified in the first stage. The value of each factor is determined by Eq. 2:

$$F_{i,j} = \frac{1}{Expl.F_{i,j}} \times \sum a_{i,j} \times Dem_i / Sup_j \qquad (2)$$

Where $Expl.F_{i,j}$ – the factor load of the dependence of demand (i), supply (j) on the identified indicators; $a_{i,j}$ – the value of demand indicators Dem_i and supply indicators Sup_j.

The third stage includes the construction of the model of supply and demand monitoring in the market of intellectual labor.

Datadescription

Empirical data for factor analysis of demand for intellectual labor are presented in Table 1.

Empirical data for factor analysis of intellectual labor supply are presented in Table 2.

RESULTS AND DISCUSSION

Factor analysis for variables entering the analysis

The mechanism of supply and demand in the market of intellectual labor is based on competition between employees for the right to apply their abilities in the most advantageous way, and employers - for the right to attract and use the most qualified workers capable of creative, innovative activity. The commodity on this market is intellectual labor, the bearer of which is personally presented by every employee engaged in mental activity. The structure of the market of intellectual labor is more complex in comparison with the structure of the labor market. The owner of human capital gets an opportunity to implement his creative and innovative skills and abilities in the process of investing in a particular business at a particular company (Fig. 1).

The construction of multifactor correlation and regression models of the dependence of supply and demand in the market of intellectual labor of a particular industry on a group of independent factors makes it possible to predict the supply and demand in the industry market of intellectual labor. We have chosen the number of hours spent on the creation of intellectual property objects for a certain period as a dependent index, which reflects the volume of demand for intellectual labor. Calculations were performed by the example of the Ukrainian economy. At the initial stage of the study 35 factors were selected. The volume of demand for intellectual labor is defined as the total amount of time actually spent

Table 1: The system of indicators of factor analysis of demand for intellectual labor

Indicators	Designator
The number of vacancies in the field of engineering and research work	Dem_1
Expenditures on engineering, technical and research work	Dem_2
Share of innovative products (goods, services) in total sales	Dem_3
Number of issued protection documents for inventions	Dem_4
Number of issued protection documents for utility models	Dem_5
Number of issued protection documents for industrial samples	Dem_6
Number of used industrial property objects: inventions	Dem_7
The number of used industrial property objects: utility models	Dem_8
Number of used industrial property objects: utility models	Dem_9
Share of intellectual product in the total value of works performed	Dem_{10}
Share of innovation in the total volume of services rendered	Dem_{11}
The ratio of the number of implemented scientific-innovative developments to the number of works performed	Dem_{12}
Amount of financing of innovation activity at the expense of own funds	Dem_{13}
The number of open venture capital companies in the industry	Dem_{14}
Income from the use of intellectual property	Dem_{15}
Amount of financing of innovation at the expense of the loan	Dem_{16}
Amount of financing of innovation activities at the expense of domestic investors	Dem_{17}
Amount of financing of innovative activity at the expense of foreign investors	Dem_{18}

Table 2: The system of indicators of factor analysis of intellectual labor supply

Indicators	Designator
Number of employees	Sup_1
Planned volume of engineering and research work	Sup_2
Number of companies that are engaged in innovative activities	Sup_3
Share of companies that have departments that perform research and development work	Sup_4
Share of companies that have implemented innovations	Sup_5
Number of employees engaged in engineering and R&D	Sup_6
Number of employees with specialized secondary and higher education	Sup_7
Citation index	Sup_8
Number of employees with Ph.D. degrees, PhDs involved in sectoral scientific and technical activities	Sup_9
Number of employees with Ph.D. degrees, engaged in sectoral scientific and technical activities	Sup_{10}
The share of specialists with scientific degrees among R&D performers	Sup_{11}
Expenditures associated with the protection of intellectual property rights	Sup_{12}
Number of filed applications for the issue of titles of protection	Sup_{13}
Applications for the issue of titles of protection for utility models were filed	Sup_{14}
Number of Nobel Prize winners	Sup_{15}

by industry employees on scientific and inventive activities (Eq. 3):

$$Y_{dem} = Num_1 \bullet Uw_1/100 \bullet Uw_2/100 \bullet F_{int}, \quad (3)$$

Where Num_1 – the number of employees in the industry, thousand people; Uw_1 – the share of engineers and technicians and research workers, %; Uw_2 – the share of companies in the industry, where innovations were implemented, %; F_{int} – the average time per employee of the industry, spent on intellectual work.

The supply of intellectual labor is defined as the total amount of time employees in the industry which can be engaged in intellectual work (Eq. 4):

$$Y_{sup} = Num_1 \bullet Uw_1/100 \bullet Uw_2/100 \bullet F, \quad (4)$$

Where F– the average working time of one industry employee.

The number of factors to construct a model of demand for intellectual labor was determined by the method of "loosened rock" (Fig. 2).

As shown by Fig. 2, the number of factors is equal to three. Factor analysis was conducted for a more detailed analysis of the degree of influence of individual indicators on the level of demand for intellectual labor (Table 3).

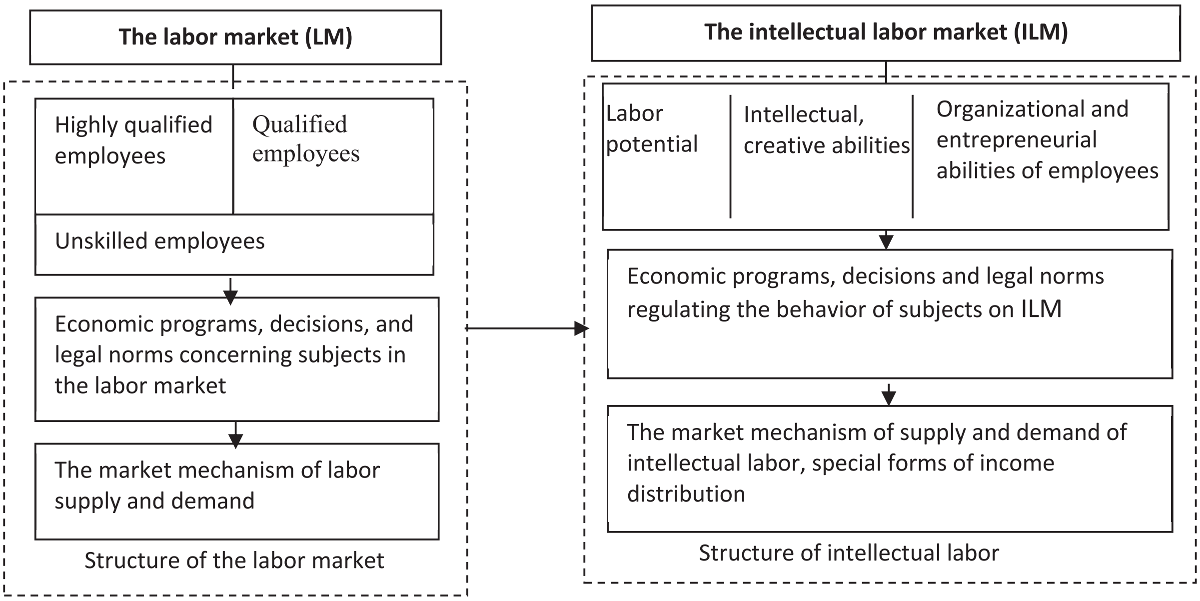

Fig. 1: Transformation of labor markets

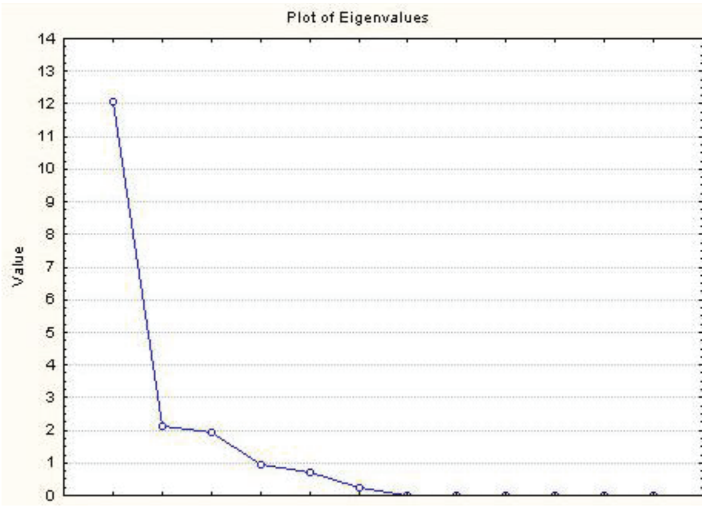

Fig. 2: The "loosened rock" graph for determining the number of factors to construct a model of demand for intellectual labor

The indicators fall within the factor where they are highlighted in red. As can be seen from the listing, the indicators of the first factor can be characterized as the number of implemented scientific and innovative developments in the qualitative section and by the sources of funding. Indicators of the second factor are characterized by the volume of financing of scientific-innovation developments from own and domestic sources. Indicators of the third factor reflect one of the essential parts of the successful application of intellectual labor - the level of their legal protection. The results of the factor analysis showed that the features of the demand for intellectual labor are almost completely characterized by the obtained three factors, which is sufficient to justify the general trends of its use. The first factor has the most significant influence on the level of use of intellectual labor, the value of its variance is 65.93%, the second - 12.19%, the third - 11.13%. Thus, the model of demand for intellectual labor according to Eq.2 looks

Table 3: The degree of influence of individual indicators on the level of demand for intellectual labor (STATISTICA 10 listing)

Variable	Factor Loadings (Unrotated) (data) Extraction: Principal components (Marked loadings are >,700000)		
	Factor 1	Factor 2	Factor 3
Dem_1	0,96601	-0,49501	0,16167
Dem_2	0,91365	-0,27254	-0,35287
Dem_3	0,94506	-0,33878	-0,33878
Dem_4	-0,36833	-0,67658	0,70989
Dem_5	-0,02865	-0,35785	0,84192
Dem_6	-0,60454	0,01664	0,77219
Dem_7	0,96645	0,01364	0,04119
Dem_8	0,85630	0,30984	0,34685
Dem_9	0,86259	-0,16357	-0,34534
Dem_{10}	0,96748	0,25810	0,05206
Dem_{11}	0,82435	0,36357	0,44345
Dem_{12}	0,90963	0,21680	0,09712
Dem_{13}	-0,53681	0,77512	0,15419
Dem_{14}	0,49966	0,15343	0,06878
Dem_{15}	0,96807	0,15773	0,15508
Dem_{16}	0,35123	0,88171	0,35123
Dem_{17}	-0,44745	0,78243	0,13308
Dem_{18}	0,35343	0,71555	0,35343
Expl.Var	12,05827	2,133475	1,956259
Prp.Totl	0,66990	0,118526	0,108681

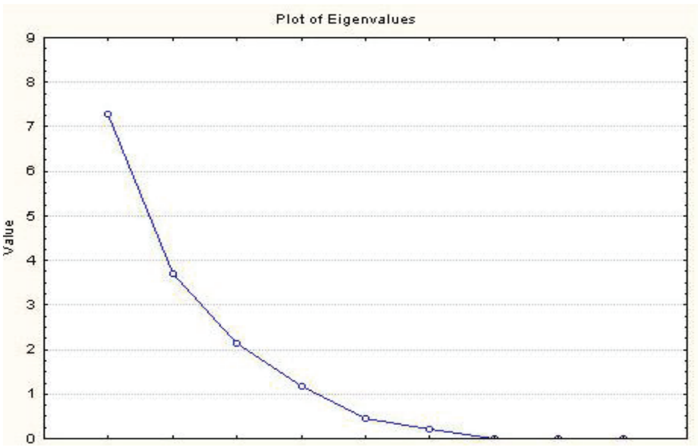

Fig. 3: Graph of the "loosened rock" to determine the number of factors to construct a model of supply of intellectual labor in the economy of Ukraine

as follows (Eq. 5):

$$Y_{dem} = \frac{1}{12,05827} \times \begin{pmatrix} 0,966Dem_1 + 0,91365Dem_2 + \\ 0,94506Dem_3 + 0,96645Dem_7 + 0,85630Dem_8 + \\ 0,86259Dem_9 + 0,96748Dem_{10} + 0,82435Dem_{11} + \\ 0,90963Dem_{12} + 0,96807Dem_{15} \end{pmatrix} + \frac{1}{2,133475} \times \begin{pmatrix} 0,77512Dem_{13} + 0,88171Dem_{16} + 0,78243Dem_{17} + \\ 0,71555Dem_{18} \end{pmatrix} + \frac{1}{1,956259} \times (0,70989Dem_4 + 0,84192Dem_5 + 0,77219Dem_6) \quad (5)$$

Preliminary analysis of the factors number into which all the indicators influencing the level of intellectual labor supply should be divided using the method of "loosened rock" showed that their number is also equal to three (Fig. 3).

The results of factor analysis of the supply on the market of intellectual labor in Ukraine are shown in Table 4.

The first factor characterizes the potential

Table 4: Results of factor analysis. Determining the level of supply for intellectual labor (STATISTICA 10 listing)

Variable	Factor Loadings (Unrotated) (data) Extraction: Principal components (Marked loadings are >,700000)		
	Factor 1	Factor 2	Factor 3
Sup 1	0,74669	0,65501	-0,03102
Sup 2	0,85336	-0,02721	-0,30345
Sup 3	-0,32981	0,89587	-0,02001
Sup 4	0,87238	-0,24118	-0,40314
Sup 5	0,95609	0,19341	-0,01943
Sup 6	0,96079	-0,12794	0,04119
Sup 7	-0,16133	0,48819	0,86159
Sup 8	-0,23466	0,39093	0,76974
Sup 9	-0,57542	0,46837	0,67171
Sup 10	0,53381	0,13251	0,79729
Sup 11	-0,29862	-0,58548	0,77038
Sup 12	-0,42396	0,79131	0,21613
Sup 13	-0,26925	0,75716	-0,18631
Sup 14	-0,43378	0,81397	0,20833
Sup 15	-0,43045	0,69741	-0,01963
Expl.Var	7,291981	3,718119	2,134396
Prp.Totl	0,486132	0,247875	0,142293

volume of scientific developments in the economy of Ukraine: the number of companies, organizations and potential performers of scientific research. The value of its dispersion is 48.61%, which indicates a weighty influence on the achieved level of intellectual labor supply. If the first factor reflects the potential supply of intellectual labor, the second factor is reasonable to interpret as the actual supply. The value of its variance is 24.79%. The third factor, by its load takes the third place among the factors that have a significant impact on the value of the supply of intellectual labor. It characterizes the achieved level of qualitative support of scientific and innovation developments by the executors. It is reasonable to consider this factor as an assessment of compliance of the actual level of qualification of various groups of executors to the successful implementation of innovative developments. The value of its dispersion is 14.23%. Thus, the supply model for intellectual labor according to Eq. 2 looks as follows (Eq. 6):

$$Y_{sup} = \frac{1}{7,291981} \times \begin{pmatrix} 0,74669Sup_1 + 0,85336Sup_2 + 0,87238Sup_4 \\ +0,95609Sup_5 + 0,96079Sup_6 \end{pmatrix} + \frac{1}{3,718119} \times \begin{pmatrix} 0,89587Sup_3 + 0,79131Sup_{12} + 0,75716Sup_{13} \\ +0,81397Sup_{14} \end{pmatrix} + \frac{1}{2,134396} \times \begin{pmatrix} 0,86159Sup_7 + 0,76974Sup_8 + \\ 0,67171Sup_9 + 0,79729Sup_{10} + 0,77038Sup_{11} \end{pmatrix} \quad (6)$$

Creating a model for monitoring supply and demand in the intellectual labor market

The third stage involves the construction of a model for monitoring supply and demand in the market of intellectual labor (Fig. 4).

Discussion of the current situation in the intellectual labor market

The monitoring made it possible to: 1) determine the current supply and demand ratio in the market of intellectual labor; 2) develop appropriate measures to eliminate the identified imbalance. Calculations in 2019 and 2021 showed that before the pandemic COVID-19 there was an excess of supply over demand (by 13%), then there was an excess of demand (by 20%). This situation is explained by the fact that the majority of employees in the intellectual sphere have an opportunity to organize their workplace and algorithmize intellectual processes in an optimal way in view of the forced remote or distancework. The current situation in the intellectual labor market shows that before the pandemic, the excess of supply over demand was justified and confirmed by studies (Chitsaz *et al.*, 2019; Ganotakis, 2010; Hasbullah, 2006). This is due to the first two supply factors: the number of companies, organizations, and R&D performers who worked permanently in a business environment (offices) (Chitsaz *et al.*, 2019; Ganotakis, 2010; Hasbullah, 2006). Indeed, before the pandemic, only a small part of employees

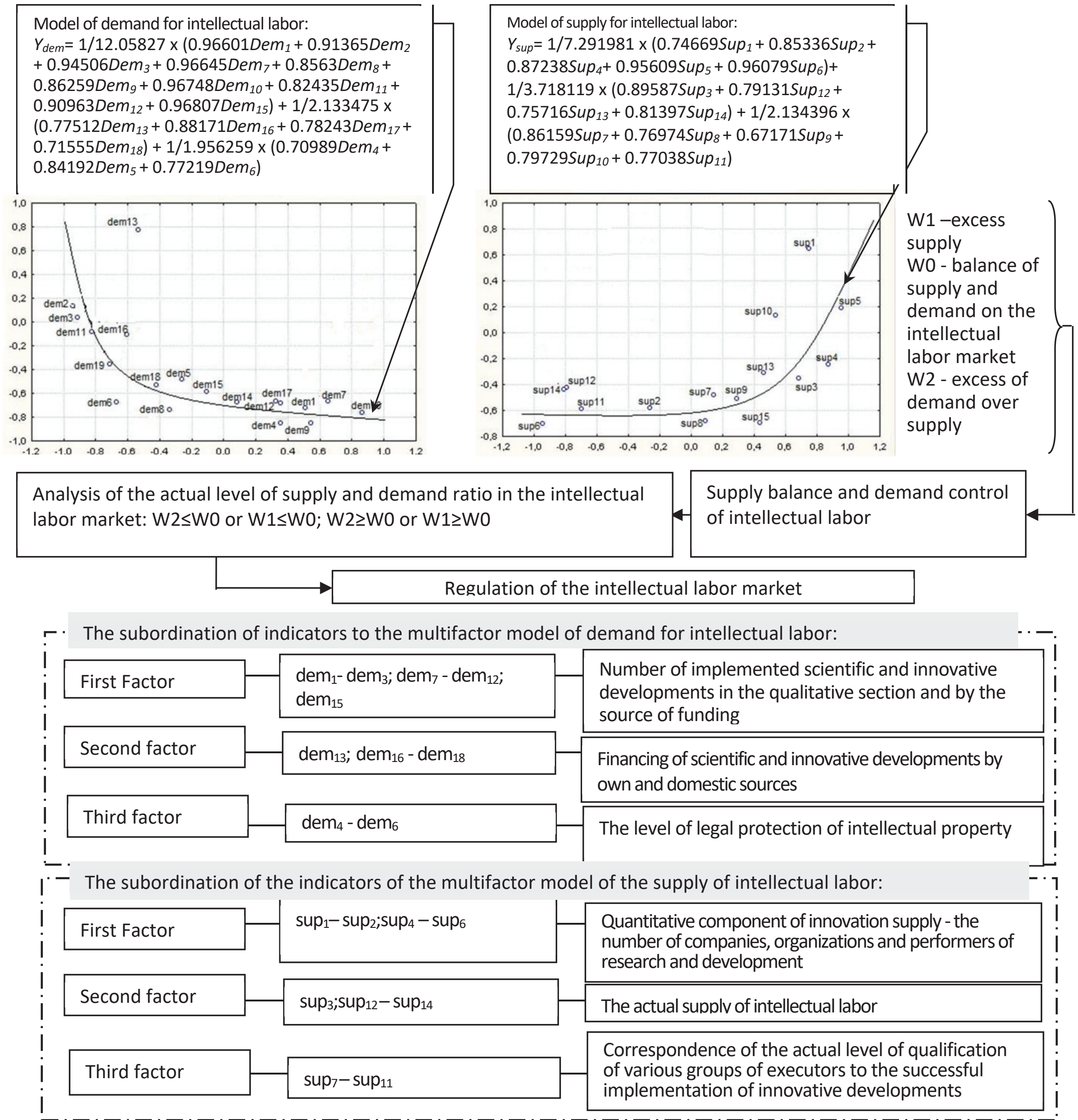

Fig. 4: Model for monitoring supply and demand in the intellectual labor market

worked remotely from time to time (Intarakumnerd *et al.*, 2002; Mayo, 2002). After the pandemic (2021), most intellectual work is done remotely (in the remote mode) (Gupta *et al.*, 2020). This, at a fundamental level, have an impact on the level of demand for this type of work and makes it possible to turn the economy around. This situation makes it possible to implement efficient differentiation of labor, optimizing transaction costs. Digital platforms "facilitate the division of tasks" by means of "efficient allocation of resources and consistent reduction of transaction costs.

CONCLUSION

The current situation forces organizations of all forms of ownership to pursue an active personnel policy, i.e. the accumulated intellectual capital becomes one of the main factors of business competitive ability. Particularly development of intellectual labor market will make it possible to increase the level of innovative applicationof own labor potential, because the field of application ofhuman labor having knowledge and work experience in various directions is much broader, than the sphere of application of human labor when people do not have necessary qualification level. Analysis of the development of situation in the field of application of achievements of STP before and after pandemic made it possible to come to the conclusion that at the present moment the situation in the market of intellectual labor is influenced by several key factors:

- Imbalance between the supply and demand of intellectual labor and the use of funds to pursue an active policy of attracting creatively thinking and innovative employees;
- Preservation of low competitive ability of certain categories of citizens on the intellectual labor market due to limited opportunities to implement their individual intellectual abilities: young people without work experience, women with underage children, able-bodied people with disabilities, difficulties related to find jobs for graduates completing the course of professional educational institutions of all levels;
- Inter- sectorial reallocation of the labor force as a result of the realization of organizational and entrepreneurial capital, the complexity of small business development, the complexity of solving the problems of employment and, consequently, of increasing the efficiency of the use of intellectual capital;
- Insufficient adaptation of the education system, structures of social and cultural sphere to the current situation on the market of intellectual labor: low level of retraining, advanced training of personnel on the basis of intra productive training of employees, lower level of use of knowledge, loss of skills and abilities;
- Insufficient level of cultural and moral performance of enterprise employees, growth of psychological tension in the society as a result of the COVID-19 pandemic, degradation of the social sphere as a consequence of insufficient financing of education, science.

Therefore, here are the major lines of action in this market in the medium-term perspective:

- Preservation at the national and regional levels of funding of measures to promote the development of vocational education; development of intra-company training system of company personnel, organizations, advanced vocational training of employees, increasing their competitiveness and professional mobility in the market of intellectual labor;
- Equalization of the general education level of the workforce, development of their intellectual and creative-innovative abilities, and the development of mechanisms to meet the needs of organizations for graduates of all levels of vocational education institutions;
- Encouraging citizens to start their own businesses through the active use of digital forms of employment, expanding measures and ways of supporting venture business.

AUTHOR CONTRIBUTIONS

V. Scherbak generated the general idea, analyzed and interpreted the data, prepared the manuscript text and manuscript edition. L. Ganushchak-Efimenko organized the fieldwork, summarized the data, and prepared the manuscript. O. Nifatova conducted a sectoral analysis of the labor market and performed a literature review. V. Yatsenko conducted experiments.

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CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. Besides, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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ABBREVIATIONS (NOMENCLATURE)

%	Percentage
COVID-19	CoronaVirus Disease 2019, coronavirus infection 2019-nCoV
Eq.	Equation
EU	European Union
Expl.Var	Explanatory Variable
Fig.	Figures
ILM	Intellectual labor market
LM	Labor market
Prp.Totl	Percentage of the total variance explained
STATSTICA	Statistical analysis software package
Var	Variable
WHO	World Health Organization

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ORIGINAL RESEARCH PAPER

The relationship between individual characteristics and practices of self-leadership strategies in Academia

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ABSTRACT

BACKGROUND AND OBJECTIVES: Self-leadership is an uplifting concept in this technologically driven world. Given the potential benefits of self-leadership and its increasing popularity, it is surprising that self-leadership is an under-researched topic. The purpose of this study was to understand the personality factors related to the use of self-leadership behaviors.
METHODS: This study analyzed data obtained from 217 respondents through an online survey. The study proposed model was tested using multiple regression to analyze individual characteristics of self-leaders and the results indicated that the model was partially supported.
FINDINGS: The findings indicate that individual characteristics do predict self-leadership. Personality traits variables conscientiousness (beta = .32, p < .01) and openness (beta = .26, p < .05) have a significant positive relationship with self-leadership practices. Surprisingly, this study found emotional stability has no significant relationship with self-leadership behavior.
CONCLUSION: The results of this study suggested that conscientiousness is important in the development of self-leadership meta-skills possibly through self-directed self-regulation and the practice of self-leadership. This study also employed a rigorous validation technique therefore, this study was able to address some of the methodological limitations of previous studies such as common method variance by examining the proposed relationships in a longitudinal setting.

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INTRODUCTION

Following the event, Great Recession 2008–2013, the environment for business organizations has become volatile, and full of unpredictable events that challenged professionals to perform in a reality (Furtner *et al*., 2015). Previous research supports self-leadership strategies are to be effective in enhancing the performance of individual**s** in work, athletic, and educational settings (Houghton *et al.,* 2004 Ingvarson, 2009; Stashevsky *et al*., 2006). However, it is important to explain that for an organization to survive nowadays productivity, it has to build a specific leadership that can demonstrate intelligence, in all its aspects within the organization to persuade others, and introduce the management appropriate tend always the consideration of motivation the staff. However, to ensure that they feel happy with their job to the evolution of organization (Dinh *et al.,* 2014; Marques *et al.,* 2019; Zehnder *et al.,* 2017). Self-leadership practices offer many potential benefits, however, it is surprising that self-leadership is an under-researched topic (Bush *et al.,* 2020). Some research has investigated the relationship between self-leadership and personality (Bendell *et al.,* 2019; Gagné and Deci, 2005; Neck and Manz, 2010), yet few rigorous studies have been conducted. According to (Stewart *et al.,* 2019), little or less is known about the characteristics of individuals who are self-leaders. This is surprising given that some studies of self-leadership assume that personality traits are mostly responsible for self-leadership behavior (Prussia *et al.,* 1998). Given this focus on personality, it is not surprising that attention has not been paid to non-personality characteristics, such as the attitudes of individuals. Furthermore, yet, from a managerial point of view, understanding how traits and the work context affect employees' self-leadership behavior, and not just outcomes can be immensely helpful. This is because an understanding of how individual factors influence self-leadership can help top-level management make more informed decisions when implementing human resources development programs in their organizations. Given the relatively scarce, and fragmented research on the links between individual factors, on the one hand, and with self-leadership, on the other, more rigorous studies must be conducted to fill the gap. Thus, this study goes beyond existing studies by investigating the effect of individual factors on the practice of self-leadership**.** More specifically, it is necessary to understand the degree to which individual differences (i.e., personality traits and attitudes) and situational factors (i.e., job autonomy, time pressure, the perceived stressfulness of the environment) are related to self-leadership. Given the mounting interest in the effects of personality on individual behavior in the workplace, research on personality and other individual differences as predictors of self-leadership has been urged (Houghton *et al.,* 2004) due to limited studies that have been done so far. Therefore, this study will examine the interactive effect of individual factors on self-leadership. Besides, to date, outside of Western populations, very little self-leadership research has been conducted**.** However, the self-leadership application is likely to differ across cultures and regions. While there have been a few studies on self-leadership done in Western countries. However, no research has been done in the world's 6th most populous and multicultural country like Pakistan. It is therefore important to investigate self-leadership in multicultural contexts because it will provide a foundation for understanding its generalizability potential. Neck and Milliman (1994) argued that it is vital for individuals to know how to lead themselves before they lead or manage others. Therefore, they need first to make sure that they are themselves effective self-leaders so that they can set an example for the people they want to lead. This study provides a compelling background for a research study grounded in the discipline of human capital. It is vital to understand the contributing factors that influence the practice of self-leadership in academic settings because they occupy a prominent position in the knowledge production processes. The findings of this study will increase the understanding of not only the characteristics of individuals with the propensity to practice self-leadership but also of the types of contexts or situations that may facilitate self-leadership behavior. Second, this study contributes to self-leadership theory and empirical knowledge by investigating the interaction between individual factors that influence self-leadership behavior. Individuals who self-lead can initiate positive behavioral outcomes; thus, it is important to know if the individual's self-leadership would be different in every context and situation. Further, the self-leadership construct has been relatively slow to develop (Neck and Houghton 2006) due to the lack of a validated measurement scale. This study will fill a void in the literature since it is empirical as opposed to conceptual.

Theoretical background and hypotheses development

The self-leadership concept originated from the social cognitive theory which suggests that human behavior can be best explained by a triadic model that includes cognitive influences, environmental influences, and behavior (Bandura, 1986). This theory describes human behavior as cognitive processes that are put into action by the effects of the environment (Neck and Houghton, 2006). One aspect which illustrates a uniquely human capability that people utilize to evaluate and alter their thought and behavior is self-reflection (Bandura, 1986). In line with this thought, the beliefs that individuals have about themselves and their abilities are essential elements of self-control (Neck and Manz, 1996). This is where the term self-efficacy, which refers to individuals' self-assessments of their capabilities, emerged. The importance of self-efficacy is in the way in which it affects the direction and persistence of effort. Self-determination theory (Deci and Ryan, 1985), which suggests individual motivation consists of extrinsic motivation and intrinsic motivation. Extrinsic motivation refers to external factors such as tangible rewards, whereas intrinsic motivation is developed internally within a person (Deci and Ryan, 1985) proposed that humans are active participants who seek to achieve their needs and goals, which become internalized. Indeed, (Locke and Latham, 2004) argued that humans can make choices and act according to their interests and goals. However, having can choices and act according to one's interests and goals would not be of much help without efficacy (Gagné and Deci, 2005). This brings us back to social cognitive theory's emphasis on the importance of self-efficacy, which refers to the necessity of a person's self-assessment of their capabilities to perform a task (Manz and Sims Jr, 1980). In other words, having the will to do something with the ability to do it will be a reality with the wants and needs to do it. Having said that, self-determination theory has become an important part of self-leadership, in which natural rewards strategies represent a form of intrinsic motivation in self-regulation (Manz, 1986; Neck and Houghton, 2006; Pinskaya *et al.,* 2021; Ghazalia *et al.,* 2021). Neck and Milliman, (1994) linked self-leadership with cognitive therapy by suggesting various strategies, such as challenging dysfunctional thoughts by using rational thoughts and beliefs. However, many of the problems that individuals encounter in today's world result from dysfunctional thought processes that often lead to depression. In response to this, constructive thought pattern strategies seek to eliminate such distorted beliefs (Neck and Manz, 2010).

Self-leadership strategies

The utilization of mental and behavioral techniques can be further divided into three sets of strategies namely: constructive, behavior, and natural reward strategies (Houghton *et al*., 2004; Manz, 1986; Neck and Milliman, 1994; S. Williams, 1997). These strategies teach people to be conscious of their behavior and thought to be more effective in their work-life. According to Neck and Manz (1996), effective designed behavior strategies aimed to enhance desirable positive behavior that results in successful outcomes, while in contrast, it reduces undesirable negative behavior that may result in unsuccessful outcomes (Mahoney, 1978; Neck *et al*., 1999). The behavior strategic approach focuses on identifying and replacing undesired behavior with more effective desirable behavior through self-setting goal process, self-correcting, self-observation, self-cueing, and self-reward (Mahoney, 1978; Mahoney and Hermodson, 1979; Manz and Sims Jr, 1980; Neck and Houghton, 2006). Plenty of research work suggests that specific, realistic, and challenging goal setting impact significantly performance suggests task achievement. This process is consisting of certain goals adoption while accepting challenging goals can affect individual motivation to perform (Locke and Latham, 1990). While one can improve performance through self-assessment, with pre-defined goals or targets (Manz and Sims, 1980; Neck *et al*., 1999). While constructive self-examination of unproductive behavior and reshape into a more positive desirable direction (Marques-Quinteiro and Curral, 2012; Politis, 2006). The next step is to link self-reward to goal achievement. This self-reward varies with the level of goal achievement. While individuals need reward contingencies to energize direct necessary behavior towards better performance (Mahoney, 1978; Mahoney and Hermodson, 1979; Manz and Sims, 1980). Similarly, to shape desirable behavior effectively self-feedback can also be used (Manz and Sims, 2001). However, more importantly, is the practice desire behavior which helps an individual in the correction if needed, which may avoid costly miscues. Winding up, behavior strategies encourage and motivate the desirable positive behavior by suppressing negative undesirable behavior which could lead to successful outcomes (Manz, 1992; Manz and Sims Jr, 1980; Neck *et al.*, 1999). Constructive focus strategies in contrast, to behavior aimed strategies, is the formation of positive constructive patterns of thought thinking in habitual ways that may impact improved performance (Neck and Houghton, 2006). Alves and Wood (2006), constructive positive thinking reduces dysfunctional beliefs, negative assumptions, while increase and build a positive self-image. To align cognition with positive behavior, individuals may apply constructive focus strategies at the time when they engage in visualizing performance (Neck and Manz, 1996). However, these strategies involve the habitual functional pattern of thinking to create and maintain constructive thought. The self-analysis process, may enable individuals to identify, comfort, and replace negative assumptions with more positive and rational ones (Manz, 1992; Marques, 2014). Natural reward strategies increase intrinsic motivation, an essential key component for successful performance (Neck *et al.*, 2004). However, task enjoyable features enhanced self-determination and could result in increased subjective competence experience (Alves and Wood, 2006). People primarily opt for two types of natural reward strategies, by adding more enjoyable or pleasant aspects of the activity or task, such that it becomes naturally rewarding it-self. This can be achieved by focusing and directing one's perception away from undesirable aspects to diverting it on the rewarding pleasant aspect of the task (Neck and Houghton, 2006; Neck *et al.*, 2004). This could lead to enhanced competence, sense of purpose, and self-control (Deci and Ryan, 1985). While enjoyable feature building into an activity or task becomes itself gratifying by task intrinsically reward aspects (Neck and Houghton, 2006). Hence, previous research, for instance, Gomes *et al.*, (2015) shows for innovative behavior natural reward strategies are necessary, and experience pleasant experiences during goal-striving activities.

Hypothesized model of the study

The variables hypothesized to predict self-leadership are shown below. Fig. 1 shows the model of the Study, with three personality traits proposed as predictors of self-leadership.

Personality traits

Personality is a stable pattern of characteristics and traits that shapes the behavior of individuals and differentiates people from one another (Matthews *et al.*, 2003). Personality is also likely to influence individuals' behavior, life and career choices, and job performance (Borghans *et al.*, 2008). There are two ways in which personality affects self-leadership. First, personality affects self-leadership by affecting the self-regulation or self-management process directly (Barlett and Anderson, 2012). Second, personality affects self-leadership through its effect

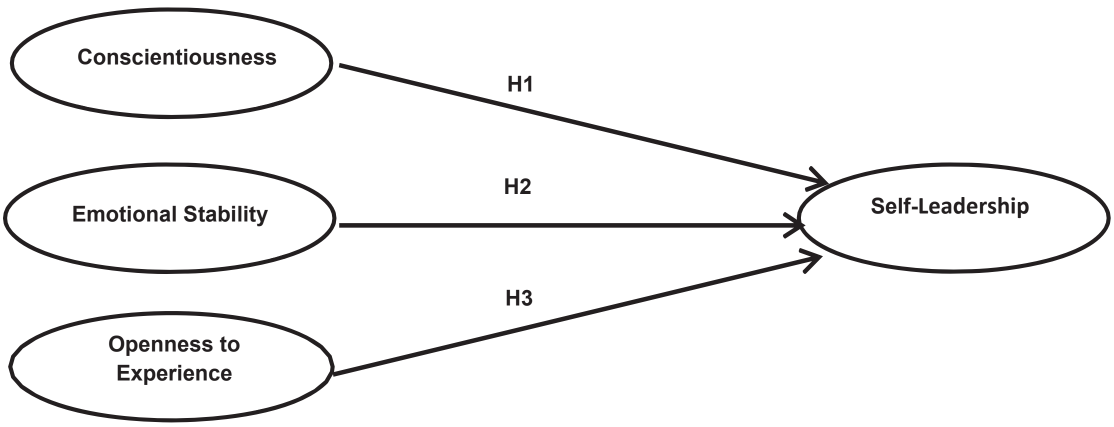

Fig. 1: Personality traits and self-leadership

on meta-learning or levels of meta-skill (Azucar *et al*., 2018). To date, there is limited research demonstrating that personality traits are important predictors influencing the practice of self-leadership. There are exceptions though. For example, (Williams and Collins, 1995) evidenced self-management and personality as a significant positive relationship. The judging dimension, which corresponds with conscientiousness and sense, corresponds to openness to experience and was associated with self-management. As can be seen from this list of studies on self-leadership (and its predecessor, self-management) and personality traits, these studies have been cross-sectional, except the study by (Stewart *et al*., 1996) which involved interventions. The cross-sectional studies are vulnerable to common methods variance (CMV) (Menzel *et al*., 2010). Based on this previous research, it appears as though personality and self-leadership are likely to have a positive effect. However, there is also a limitation on previous work in terms of theory due to the use of MBTI; which is not a robust theory. Therefore, this study uses a well-validated personality model on which to develop hypotheses. This study used the Big-Five model (Goldberg *et al*., 2006) because it is a well-accepted personality dimension and can serve as a meaningful classification of personality traits. Furthermore, the Big-Five model has been found in conceptual frameworks across different samples in various studies. Besides, previous studies show the Big Five personality traits yielded strong relationships with motivation and performance (Mount *et al*., 2005).

Conscientiousness

Conscientiousness is defined as the tendency to be dependable (reliable, careful, and responsible), efficient (competent, organized, dutiful, purposeful, self-disciplined and thorough), and industrious (hardworking, goal-focused, achievement striving and persistent (Houghton *et al*., 2004; Ilgen and Pulakos, 1999; Stewart *et al*., 1996; Williams and Collins, 1995). Self-leadership involves conscious observation of one's behavior, the planning of goal setting, self-cueing, organization of one's time and environment, and consistent practice (Manz, 1986). These skills are consistent with those who tend to be hardworking, achievement-oriented, and goal-setting (Jensen *et al.*, 2002; Mount *et al*., 2005; Roberts *et al.*, 2009; Roberts *et al*., 2014; Robertson *et al*., 2000). Empirically, (Gerhardt *et al*., 2007) found that conscientiousness was related to self-management for a sample of 228 undergraduate students. In another separate study, (Bendell *et al*., 2019) observed conscientiousness was related to intrinsic motivation, which is one of the natural reward strategies of self-leadership. Similarly in another study was conducted on a sample of systems engineers at a large information systems company at a Japanese automaker (Watanabe *et al.,* 2011). Following this theoretical rationale, the following hypothesis is proposed:

Hypothesis 1: Conscientiousness will be positively related to self-leadership

Emotional stability

Emotional stability, often called neuroticism, has been described in the literature as an individual's degree of self-confidence, tolerance of stress, optimism, and self-consciousness (Hills and Argyle, 2001). Emotional stability enables an individual to remain steady under pressure and to handle negative feedback (Gerhardt *et al*., 2007; Hay and Ashman, 2003; Hills and Argyle, 2001) found that neuroticism was negatively related to goal-setting. Other than a self-goal setting, I argue that emotional stability is also related to other self-leadership strategies. (Watanabe *et al*., 2011) the model suggested that anxiety, which is closely related to neuroticism, leads to poor self-regulation generally. In particular, the high level of emotionality (Salgado, 2002) associated with low emotional stability, would impair rational decision making and the self-awareness strategy. Finally, neurotic individuals are also more likely to have irrational beliefs and assumptions about themselves (Gerhardt *et al*., 2007), which may cloud their judgment in assessing their ability accurately. Therefore**,** the following hypothesis is expected:

Hypothesis 2: Emotional stability will be positively related to self-leadership

Openness to experience

Openness to experience, or the intellectual dimension of the Big Five personality traits, is characterized by individuals who are curious, imaginative, artistic, creative, broad-minded, and intelligent and have a positive attitude toward learning. Previous studies suggested that openness to experience may influence individuals' propensity to practice self-leadership due to their achievement orientation nature. This appears to be supported by empirical evidence. (Williams and Collins, 1995) in their study, a sample of 347 university students enrolled in educational psychology courses was invited to participate in the study during their class period. (Roberts *et al*., 2014) found a correlation between openness to experience and goal-setting motivation a construct which, while not exactly a self-leadership strategy is likely to be closely associated with behavioral self-leadership (Goldberg *et al*., 2006; Menzel *et al*., 2010; Terracciano *et al.,* 2008). Furthermore, previous studies have suggested that individuals who are open to experience tend to be able to find meaningfulness and to experience feelings of competence, which is associated with the competence aspect of the natural rewards strategy. For these reasons, hypothesis 3 were developed:

Hypothesis 3: Openness to Experience will be positively related to self-leadership. The current study has been carried out in Peshawar in December 2020.

MATERIALS AND METHODS

Participants and procedure

The respondents were students from the Pakistan public universities as outlined by the Higher Education Commission of Pakistan. Before data collection, permission was sought from the Higher Education Regulatory Authority (HERA), Peshawar. Surveys were administered via the internet to ease data collection, specifically, the costs, geographical coverage, and speed of delivery. A total of 217 respondents participated in the survey. The overall response rate after data cleansing (missing values and outliers) was approximately 72%. This response rate was encouraging and greater than other related studies regarding students with response rates ranging between 30 to 57 percent (Dee *et al*., 2000). Almost 66% of the students were male and many had worked previously (39.8% casual work; 30.6% part-time work; 20.4% full-time work) Table 1. Participants ranged in age from 18 to 44 years and the average years of employment were 5.69 with a standard deviation (SD) = 3.91.

Measures

A 5-point Likert scale ranging from 1 (never true) to 5 (very true) for the self-leadership scale and 1 (not at all accurate) to 5 (completely accurate) for personality traits. While conscientiousness and Openness to experience were assessed with five items from the International Personality Item Pool on a 5- 5-point Likert-style response scale (Goldberg *et al*., 2006). Emotional stability was assessed at time one and time two with six items from the International Personality Item Pool (Goldberg *et al.,* 2006). Self-leadership skills were assessed with 35 items from the revised Self-Leadership Questionnaire (Houghton and Neck, 2002)**.** In this study model hypotheses suggested that conscientiousness (Hypothesis 1), emotional stability (Hypothesis 2), and openness to experience (Hypothesis 3) would be positively related to self-leadership. To ensure no violation of the assumptions such as linearity, normality, multicollinearity, and homoscedasticity preliminary analyses were conducted**.** Multivariate outliers can be detected by inspecting the Mahalanobis distances using multiple regression (Riani *et al*., 2009). An investigation of multivariate outliers using Mahalanobis distance through the SPSS 24. Regression analysis was undertaken, as mentioned above, and based on the recommendation of Tabachnick *et al*. (2007) and Rucci *et al.* (2007) step-by-step procedure. The normality distribution of data was assessed by both graphical

Table 1: Respondents profile

	Frequency	Percent
Gender		
Male	142	65.4
Female	75	34.6
Education qualification		
14 years of schooling	146	67.3
16 years of schooling	71	32.7
Employment status		
Casual work	87	39.8
Part-time work	75	30.6
Full-time work	55	20.4

methods and statistical tests. The skewness and kurtosis were within the ±1.0 range except for one variable. The other normality tests like Kolmogorov-Smirnov were statistically significant for a few variables. The other statistic used to assess normality was the comparison between the mean, the trimmed mean, and the median to see whether the extreme scores had a strong influence on the mean and the results show no violation of the normality distribution regarding data.

Correlation between the variables

Multivariate analysis requires variables to be correlated with each other. A correlation coefficient above .30 is preferable. Nakagawa (2004) suggested that the value of r =.10 to .29 is having a small relationship strength between variables, the value of r = .30 to .49 is considered as having a medium strength of the relationship, and the value of r = .50 to 1.0 is considered as large strength (Taylor, 1990). This guideline applies to both negative and positive values (Brünger, 1992). The correlations between variables are shown in Table 2. The positive correlations among conscientiousness and openness to experience with self-leadership suggest support for hypotheses 1 and 3. In this case, both of the scales (conscientiousness and openness to experience) correlate substantially with self-leadership (.315 and .316 respectively). However, hypothesis 2 may not be supported which means emotional stability was uncorrelated with self-leadership. The correlation between each of the independent variables should not be too high. Variables with a correlation of .70 or more should not be included in the same analysis. Multicollinearity is a problem when variables are very highly correlated, creating a situation of redundant information. From Table 2 it can be seen that the correlation between each of the independent variables is not too high; which is less than .70. Also, according to, the commonly used cut-off points for determining the presence of multicollinearity are tolerance values of less than .10 or a VIF (Variation Inflation Factor) value of above 10. In this study, the tolerance value for emotional stability, openness to experience, and conscientiousness is not less than .10 (.867, .820,s .941 respectively); indicating no multicollinearity problem. This is also supported by the VIF values, which are 1.15, 1.22, and 1.06 respectively; which is well below the cut-off of 10. Which are well within normal bounds, suggesting that multicollinearity is not present among the variables. To check for any retention or mortality biases, this study tested the differences between participants' genders. A t-test showed no significant differences on self-leadership scores for participants genders (M = 3.698, SD = .418) and non-participants (M = 3.706, SD = .356); t (106) = .219, p = .83 (two-tailed). There was also no significant difference on conscientiousness between male (M = 3.888, SD = .672), and female participants (M = 3.750, SD = .657); t (106) = –1.03, p = .31 (two-tailed), nor on openness to experience between male (M = 3.366, SD = .616) and female participants (M = 3.397, SD = .661); t (106) = .25, p = .80 (two-tailed). Finally, there was no significant difference between male (M = 3.191, SD = .811) and female participants (M = 3.064, SD = .677); t (106) = – .83, p = .41 (two-tailed) on emotional stability. To measure the internal consistency of the variables, Cronbach alpha (α) was used. The alpha for the variables ranged from 0.88 to 0.80 (Table 3).

Table 2: Pearson Product-Moment Correlations between variables

Scale	1	2	3
1. Self-Leadership			
2. Emotional Stab	.104		
3. Openness	.316**	.358**	
4. Conscientiousness	.315**	.011	.231*

Table 3: Means, Standard Deviations, and Scale Reliabilities

Variables	Mean	Standard Deviation	Cronbach's alpha	Number of items
Self-Leadership	3.70	.40	0.87	35
Emotional Stability	3.15	.76	0.80	6
Openness	3.38	.63	0.88	4
Conscientiousness	3.84	.67	0.83	4

RESULTS AND DISCUSSION

The hypothesis of the study model suggested that hypothesis 1 (conscientiousness), hypotheses 2 (emotional stability), and hypotheses 3 (openness to experience) likely to be positively related to self-leadership. Personality traits were regressed on self-leadership after controlling for the possible effect of demographic variables. Step 1 Age, years of education and gender, were entered, explaining 1% of the variance in self-leadership. After entry of conscientiousness, openness to experience, and emotional stability at Step 2, the total variance explained was 17.4%, F (5, 100) = 3.08, p < .01. An additional 15% of the variance in self-leadership (R squared change = .15, F change (3, 100) = 5.62, p < .001) explained by the personality factors. Only two personality traits were statistically significant - Conscientiousness (beta = .32, p < .01) and Openness to Experience (beta = .26, p < .05) see Table 4.

Finally, to increase the rigor of the research, time two variables were included. Hierarchical regression analysis was used. Controlling for time one levels of self-leadership and personality factors at time one, as well as years of education, gender, and age. By including time one measures of self-leadership as well, it is possible to look at the effects of personality over and above the intervention. Essentially, by including time one measures of self-leadership in the first step, the effect of the intervention was controlled for, making it possible to examine the effect of personality independent of the intervention. This is because although personality might affect self-leadership behaviors all else being equal, it might not overcome the more proximal effect of the intervention. Therefore, Model 1 included self-leadership at time one, personality factors at time one, as well as demographic variables such as years of employment, age, and gender. Model 1 explained 39% of the variance in self-leadership, whereas the total variance explained by Model 1 as a whole was 60%, F (9, 59) = 5.88, p < .001. Personality traits explained an additional 20.3% of the variance in self-leadership, after controlling levels of self-leadership and personality antecedents at time one as well as gender and age; R squared change = .20, F change (3, 59) = 6.70, p < .001. In the final model, only self-leadership at time one (beta = .55, p < .001) and conscientiousness at time two (beta = .36, p < .05) were significant. Therefore, in this more rigorous test, Hypothesis 1 and 3 were supported but Hypotheses 2 were not. In this study, the proposed model was tested and the results of the analyses indicated that the proposed model was partially supported. In particular, conscientiousness was related to self-leadership when controlling for the previous self-leadership. Openness to experience was related to self-leadership in the cross-sectional analysis but was not significant after controlling for levels of self-leadership; whereas the relationship between emotional stability and self-leadership was not supported in analysis. The results suggest that conscientiousness is important in the development of self-leadership meta-skills possibly through self-directed self-regulation and the practice of self-leadership. Openness to experience was only related to self-leadership at time one, but not at time two. Due to the intervention within this study, the reason for this could be that the participants have changed to increase their skills through self-leadership training. This is because people who changed to experience would be interested in self-

Table 4: Hierarchical Regression

Variables and Statistics	Model 1 (β)	Model 2 (β)
Gender	0.07	0.07
Age	-0.06	-0.08
Years of education	0.13	0.13
Emotional Stability		0.03
Openness to Experience		0.26*
Conscientiousness		0.32**
R^2	0.01	0.17***
ΔR^2	0.01	0.15***
F	0.47	3.08**

leadership strategies for the first time. Once they have mastered the skills, the effect of their training could be more than the effects of their personality. Besides, (Stashevsky *et al*., 2006) suggested that a self-leadership training intervention may have an effect on subjects' and above the effects of personality**.** This may be because openness to experience involves "creativity, sophistication, and curiosity" (Houghton *et al.,* 2004) and desire for knowledge (Terracciano *et al*., 2008). However, emotional stability was not related to self-leadership. It could be that the hypothesized negative effects associated with low emotional stability (e.g., rational decision making, response to feedback) were less relevant than the fact that the characteristics that are linked to it are not related to motivational goals (Barlett and Anderson, 2012). Therefore, it does not matter what level of emotional stability one has because it would not affect one's self-leadership skills.

CONCLUSION

This study discussed the personality factors related to the use of self-leadership behaviors. Although the three dimensions of self-leadership (behavioral, natural reward, and constructive thought pattern) are all internally focused, they are also distinct from one another. A behavioral focused strategy concentrates on the behavior and is self-discipline-oriented. Natural reward strategies seek to create positive aspects within the work itself, whereas constructive thought pattern strategies are an internal approach focused on modes of thinking in positive and desirable ways. Many researchers are beginning to change direction in studying work motivation by focusing on the motivational mechanisms that sustain employees' motivation and performance. Although self-leadership can be viewed as a motivational mechanism to help individuals achieve their goals, it would be helpful to investigate when self-leadership behaviors are likely to emerge. This is because although the concept of self-leadership has been around for several years, there has been a shortage of research in certain areas. It is thus hoped that the findings of this study will facilitate knowledge-based recommendations for developing self-leadership practice among employees. The current research is not without limitations. Future research if exploring the benefits of training if provided before the start of the online session will help understand the relationship. The same training is used as a moderator will also help in elaborate the phenomena. Further, this study relied on self-report data, however, due to the psychological nature of the variables. Because of the fairly small sample size with relatively low power and potential sampling bias, another study can build upon the results of this study in the future.

AUTHOR CONTRIBUTIONS

F. Afridi performed literature review, compiled the data, prepared the manuscript text and editing references. S. Jan performed the Methodology, and manuscript preparation. B. Ayaz helped in the literature review, and editing references.

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CONFLICTS OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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ABBREVIATIONS

HERA	Higher Education Regulatory Authority
SD	Standard Deviation
P	Probability
R	Regression

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ORIGINAL RESEARCH PAPER

Identifying and ranking the factors affecting social media marketing in urban cyberspace

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ABSTRACT

BACKGROUND AND OBJECTIVES: The main purpose of this study in qualitative section is to identify the factors affecting social media marketing in urban cyberspace and then in quantitative section, ranking these factors. Hence, the question has been raised as to what factors affect social media marketing in urban cyberspace?
METHODS: Due to the exploratory nature of this research, it is not possible to provide an initial response or hypothesis to the aforementioned question, and the final answer has been obtained using the theme analysis approach. In addition, based on the Analytic Network Process multi-criteria decision-making technique, the priority of the elements affecting social media marketing was discussed. In order to collect the data and get the opinions of experts, professors of the Iran Broadcasting University and senior media managers, in-depth and semi-structured interviews were conducted with 15 participants who were selected using the theoretical sampling method as well as the snowball method.
FINDINGS: Through a reciprocal process based on the theme analysis, key concepts associated with the social media marketing in urban cyberspace were extracted and finally, 1 pervasive theme and 32 subthemes were identified and categorized within the 4 main themes including factors related to marketing, competitive, and managerial factors, as well as, factors related to the social media. Also, the results from Analytic Network Process shows the preference value (Φ) of these factors respectively include the parameters of: Marketing-related factors (Φ=0.169); Managerial (Φ= 0.163); Competitiveness (Φ=0.139); and Social media (Φ=-0.133).
CONCLUSION: Presence of media in novel communication space with its general and special audiences is an opportunity which should not be ignored by the National Media. Compared to the commercial advertisements in various radio and Television channels, marketing in this atmosphere is likely to make less money (particularly at the early days), but such presence is highly significant. According to the results, the most important factors affecting social media marketing in urban cyberspace are Marketing-related factors, Managerial, Competitiveness and Social media factors.

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INTRODUCTION

Social media (SM) is an important marketing tool to achieve the target market, the importance of which cannot to be ignored (Ahmad *et al*., 2016). Nowadays, SM has become a very powerful and influential tool for presenting ideas and viewpoints. Therefore, SM plays a critical role in making informed decisions by consumers through their peers (akhavan, 2017). It is fundamentally changing the way people communicate. It is a set of Internet-based applications built on the web allowing the users to create and share generated content. Therefore, the main objective of SM is to provide a platform for linking with others through the Internet (Bagozzi and Dholakia, 2002). Just as print media, cinema, radio, and particularly television brought about change in human communication in the 1950s and 1960s (De Bell *et al*., 2017). Social networks have been able to provide an appropriate potential power to make the entrepreneurial transformation in a worldwide network. As a basic tool, the Internet has created new communication possibilities and capabilities among the communities (Benitez *et al*., 2017). The Internet was first commercially used via the world-wide web platform twenty-five years ago (Bajpai *et al*., 2012). With the development of the web technology, newer generation of Internet users revised the rules of social interactions and the ways to do business. It is noteworthy that in today's world, life without SM is challenging. Media is a source of information and entertainment and is seen as one of the factors of social change, and certainly influence the society and culture (Boon-Long and Wongsurawat, 2015). SM is changing the way information is provided to people around the world. Rapid growth of SM such as blogs and other social networking websites and sharing technologies will change the way companies respond to the customers' needs and expectations, as well as the way they compete with their rivals (Capatina *et al*., 2020). Today, the messaging approaches and actions have moved beyond the conventional media (i.e. press, radio and television), and the active field of mass communication has entered a more extensive level. These new media lay the foundations of a new culture in which the communication pattern of community members, under the influence of new relationships resulting from the consumption and use of new media, takes on a new form (Castellacci and Viñas-Bardolet, 2019). The advent of the Internet-based mass media has made it easier for an individual to communicate with hundreds or even thousands of people about their products and companies (Chatterjee and Kar, 2020). One of the important categories targeted in new areas of marketing studies is the investigation of marketing methods in cyberspace and new SM. In the current era of e-commerce, companies exploit the SM in new areas of technology and business. Therefore, they are inevitably forced to prepare for new competitive pressures by adopting new business strategies. As a result, national and international companies are moving toward the development and implementation of marketing strategies, which put them on a par with global competitors. Many companies, either small or large, should consider developing a logical solution for Internet marketing. In their study, Ghayekhloo Alivaki and Fattahi (2015) stated that since the marketing industry has used the Internet effectively since 1994, one can conclude that organizations which do not consider using the Internet in their marketing activities are making a big mistake. Globalization, complexity, and dynamics of the business environment pose real challenges for strategic marketing in the 21st century. Researchers believe that cyberspace has rapidly and profoundly changed the nature of businesses, markets as well as the economy. While some organizations have been successful in online business environments, others have failed or been unable to take advantage of cyberspace and SM (Chung *et al*., 2017). As the comprehensive and the most important media body of the government, the Iranian national media has faced a strong competitor, i.e. social networks, which play a basic role in all areas of society. Should the national media continue to follow the traditional broadcasting methods, it will definitely lose the competition. Over time, it will lose its viewers and will be overcome by the SM (Constantinides, 2014). Emergence of novel fields in today's communication areas is an outcome of fast changes in the era of information and communication where there are special requirements and conditions. Cyberspace communities are able to recognize the new conditions and strengthen their foothold (Chatterjee and Kar, 2020). The effective and active presence of the Islamic Republic of Iran Broadcasting (IRIB) entails intelligent planning and management that facilitates the overcoming of obstacles, optimal use of opportunities and achieving organizational goals. Undoubtedly, the IRIB, as a super media and the rostrum of the Islamic Republic, should play a highly important and influential role in the new communication structures in the cyberspace. In other words, with the emergence of SM and new communication structures in cyberspace and competition with the national media in attracting audiences and increased influence on cultural, political, social, economic aspects and other areas of human societies, the national media cannot but recognize these new media and exploit them to achieve its goals. Considering their own special appeals and the wide presence in the lives of their audiences and in commensurate with the content and messages they broadcast, the radio and television can have an effective and guiding presence in cyberspace in various fields. Similarly, advances of the national media towards a bold and effective presence in this competitive space requires that the content of cyberspace and the status and interaction of the IRIB in this space be investigated through conducting surveys and studies. However, not many studies have been done in this field and the gap of experimental studies in this field is evident On the other hand, this study will serve effectively to open a new and innovative model for discussing the cyberspace marketing and understanding as well as applying this idea in cyberspace in terms of the context, activity and role of its various fields. As such, the objective of this study is to identify and rank the main factors affect social media marketing (SMM) in cyberspace.The research results can play a role in presenting national media marketing strategies in urban cyberspace in order to increase competitiveness and revenue. Hence, the question arises that what are the factors influencing the SMM in cyberspace?

Literature review

Significance of social media

Media is seen as a communication means by which the sender conveys the desired meaning (message) to the recipient (Ghaykhloalivaki *et al*., 2015). SM refers to a group of Internet-based applications that affect the ideological and technological functions of the web (Iankova *et al*., 2018). In other words, SM is a description of online tools people use to share the content, profiles, opinions, views, experiences and thoughts (Felix *et al*., 2017). Therefore, the SM facilitates the online conversations and interactions between groups of people. Chang *et al*. (2017) argued that SM is a group of online applications whose goal is to facilitate interactions and content sharing. People are increasingly considering the SM programs as an important part of their daily lives and are more likely to move their interactions to virtual programs (Khaleghi *et al*., 2019). One important reason for companies to use the SM is that these channels allow them to engage in dialogue with stakeholders (Khalouzadeh Mobarakeh *et al*., 2019). Because of its increasing impact, use of SM by companies indicates that the more companies depend on the network, the more successful they will be in the long term (Cambria *et al*., 2012). SM can affect positively on entrepreneurial intentions through identity, presence, sharing, fame, groups, relations and conversation mechanism *(*Salamzadeh *et al., 2020).* This is why companies learn better when they are connected to the network. In sum, the SM helps a company to increase its brand awareness and improve its sales and market share. If the program is planned and executed properly, the SM will become a cost-effective form of advertising (Morgan *et al*., 2017; Wibowo *et al.,* 2022).

SMM and its benefits

SMM is defined as a tool for connecting and interacting with existing and prospective customers, as well as, to build customer relationships (Morris and James, 2017). On the other hand, some studies have defined it as a process of increasing the value of stakeholders through marketing activities by combining the system of SM agents in marketing communications. SMM is a new way to build profitable relationships with customers (Alves *et al*., 2016). With the growing trend of people's presence in the social media, organizations and companies are moving towards having a greater presence in the social media, so that they could attract more customers (Nazeer, 2017). SMM refers to the use of SM to achieve the organization's goals aiming at value creation for the stakeholders. Marketing activities across the SM are a subset of online marketing activities, which complement promotion-based programs (Alalwan *et al*., 2017). By launching online brand forums, marketers can expand their businesses (Kaur, 2016). Online brand forums are groups in different sizes that incorporate the personal opinions of their members through online interaction and sharing of their personal opinions, and admiring the brand that the community has created (Opgenhaffen and Claeys, 2017).

Based on Stilzner (2016) the advantages of SMM include: more access, more traffic, more loyal fans, more customer help and support, better search rankings, better sales and lower marketing costs (Phua *et al*., 2017).

Marketing in cyberspace

Cyberspace is used to describe all sources of information provided through the Internet. SM is known as the main media on the Internet and operates in this space. SM is intelligent technologies which can encourage a scattered audience to gather and actively interact with each other (Pusey and Sadera, 2012). By sharing text, image, audio and video files for exchanging information, cyberspace allows its users to hear the voice of the public in cyberspace and see their power over other communication activities. Although cyberspace is known for its technical dimensions, from a social perspective, it focuses on the effects it has on the society. This phenomenon has greatly affected the production and consumption of news content by audiences and one cannot ignore its role in the evolution of the media (Ramadan *et al*., 2018). The features of cyberspace create this capacity, which effects can be seen in the consumption and publication of content every day. One of the cyberspace's requirements for creating news content is to pay attention to the components of religious communication with the concern of going beyond delivering information and paying attention to the construction and reproduction of meaning. Measures for effective market segmentation in cyberspace marketing cannot be outlined just as a list of desirable aspects such as measurability, accessibility, relevance, operability, sustainability and differentiation. In cyberspace marketing, these measures are dynamically related. Furthermore, the overall effectiveness of cyberspace marketing segmentation strategies seeks to meet additional scalability and compatibility metrics, and it may even be argued that stability is not a basic or necessarily desirable condition for effective cyberspace market segmentation. The nature of the virtual demographic-based segmentation strategy relies on four criteria of measurability, accessibility, scalability, and compatibility. These four criteria are absolutely essential for identifying, monitoring and tracking the complex behavioral dynamics of the cyber sector in the global cyberspace (Razak and Latip, 2016).

Empirical background of the study

Research shows that in many countries, including the United States, Africa, Japan, India, Australia, the Netherlands, Malaysia, and North America, studies on SMM have been conducted to identify the differences between SMM and its role in brand equity. Finally, the present study builds on the research conducted in line with the subject at hand to prevent repetitive work while creating innovation in the research. Most studies have been conducted on the factors affecting SMM and its impact on the brand equity and purchase intention, and less attention has been given to the appropriate models and solutions. Therefore, this study seeks to fill the gap in these studies. In his study entitled "Designing a model to enhance the experience and customer's response using SMM", Khalouzadeh and Mobarakeh (2019) concluded that the categories of time management, cost management, leisure management, the right product selection, the desire for well-being and social comfort and influence are the causal factors leading to customer participation and use of SMM. Investigating SMM in the causal relationship between brand love and viral marketing, Sadrania et al. (2019) found that sport brands can strengthen the fields of viral behavior by increasing the level of their customers' participation. Investigating the impact of cyberspace on the improvement and development of businesses in a qualitative study, Akhavan (2017) found that the most important advantage of Internet networks and cyberspace is the sharing of hardware and software resources and quick and easy access to information. Among other advantages of access to the cyberspace are global access and transfer of information on a large scale, being fast, lower cost, convenience and action speed, services for citizens and social and cultural interactions (Sharifi *et al*., 2016). Ramadan *et al*. (2018) discussed the impact of brand and SM communications on the perceived value of Facebook advertising. Their results show that the overall experience of users on Facebook is based on three key areas of communication with friends, social networks and advertising brands. Hence, it contributes to the perceived value of advertising on Facebook (Stelzner, 2011). In a study entitled "Customer-Based Brand Equity in the 21st Century: the role of SMM", Yazdanparast *et al.* (2016) showed that brand-based SMM is essential in influencing the customer's attitude toward a brand.

In his study entitled “The effect of SMM on brand loyalty based on structural equation modeling”, Ahmad (2016) showed that SMM has an important effect on brand loyalty, brand awareness and the relationship between SMM and brand loyalty.

MATERIALS AND METHODS

The present study aims at identifying the factors affecting SMM in cyberspace. Therefore, the present study is applied in terms of its objective. The research revolves around marketing, SM and particularly SMM as its main topics. The research approach is mixed (i.e. qualitative-quantitative) and the statistical population includes the experts and university professors specialized in media and marketing, as well as the senior SM managers with at least a master’s degree and ten years of work experience. In the qualitative section, sampling was done by the snowball method. The data collection tool is a semi-structured interview. This study reached the saturation point with 15 interviews. Furthermore, the theme analysis technique was used to analyze the data obtained from the interviews. Theme analysis is a way to determine, analyze and express patterns in the obtained data. This method at least organizes the data and describes it in detail. This analysis includes a continuous flow between the dataset and the encoded summaries, and the analysis of the generated data. Writing the analysis starts from the first step. In general, there is no single way to start studying a theme analysis. The six steps of theme analysis are as follows:

• *Step 1) Familiarity with the data:*

In order to become familiar with the depth and scope of the data content, it is necessary for the researcher to immerse himself/herself in them to some extent. In the present study, the researcher examined all the data obtained from the interviews before starting to encode the data. At this stage, the researcher also began note-taking and marking the themes for the next stages.

• *Step 2) Creating the initial codes:*

The second stage begins when the researcher examines the data and becomes familiar with it. This step involves creating the initial data codes. Codes provide a data feature that the analyst finds interesting. The encoded data are different from the analysis units, i.e. the themes.

• *Step 3) Searching the themes:*

This stage involves categorizing various codes into the potential themes, and sorting all the encoded data summaries into specified themes. In fact, the researcher begins to analyze his/her codes and considers how the different codes can be combined to create an overall theme. At this point, some primary codes form the main themes, while others form subthemes, and the rest are omitted. There is likely a set of codes at this point that do not appear to belong anywhere.

• *Step 4) Reviewing the themes:*

The fourth stage begins when the researcher creates a set of themes and reviews them. This stage includes two steps of reviewing and refining the themes. The first step involves a review at the level of coded summaries. In the second step, the credibility of the themes in relation to the dataset is taken into account. If the theme map works well, then it is possible to go to the next stage. However, if the map is not consistent with the dataset, the researcher should go back and continue the coding until a satisfactory theme map is created. At the end of this stage, the researcher should have sufficient knowledge of what the different themes are, how they fit together, and the whole story they tell about the data.

• *Step 5) Defining and naming themes:*

The fifth stage begins when there is a satisfactory map of the themes. At this stage, the researcher defines and reviews the themes he/she presents for analysis, and then analyzes the data within them. By defining and reviewing, the nature of what a theme is discussing is determined and it is specified which aspect of the data each theme has.

• *Step 6) Developing reports:*

The sixth stage begins when the researcher has a set of well-established themes. This stage includes the final analysis and report writing.

To ensure the validity and reliability of the data in a qualitative research, the necessary investigations including acceptability and verifiability were made. To increase the degree of acceptability, the researchers obtained the necessary approvals by retrieving the speech and ideas during the interviews and summarizing the statements of the interviewees at the end of the interviews for confirmation or correction by the interviewees, and their suggestions were taken into consideration. In order to verify the obtained pattern, suggestions were returned to the seven initial participants for review and approval, and the suggested points were applied and the final approval was obtained.

In the quantitative section, conducting a survey, the data were obtained from 21 questionnaires completed by the professors of Iran Broadcasting University and senior managers of this media based on Judgmental sampling and all of questionnaire were analyzed. In this part, the priority of the components affecting SMM was determined based on the ANP multi-criteria decision-making technique.

RESULTS AND DISCUSSION

Qualitative section

To analyze the data, the axial and open coding techniques were utilized. As a result of the coding process and deleting the repetitive data and final summarization of data, one pervasive theme and 32 subthemes were identified and categorized within the 4 main themes. A summary of the dimensions, main themes and subthemes are given in Table 1. In this table (Table 1), the initial codes are collected in a set based on their authenticity where they have received a conceptual label thus creating a subtheme. Then, considering the unique messages they convey, the concepts were assigned to different categories composing the main themes. The main themes, in turn, compose the pervasive themes or dimensions. In view of the fact that what common meanings are induced by the different main themes, the researchers assigned them to the special dimensions. Indeed, an inductive process moving from raw data to the concepts (subthemes), categories (main themes) and abstract dimensions is seen in this categorization. It is noteworthy that to label the conceptual concepts, the researchers frequently referred to the literature in all various stages of the data analysis to verify the extracted concepts and to ensure their comparability, in order to put the findings across a broader study context in the literature. In fact, the literature review

Table 1: List of pervasive themes, main themes and subthemes obtained from the theme analysis process

Pervasive theme	Main theme	Subtheme
Identifying the factors affecting SMM	Marketing related factors	Marketing mix (Product, Price, Place, Promotion)
		Easy access to the cyberspace
		Determining the market share in various social media
		Content marketing in social media
		Accurate design of messages based on the audience's needs and desires
		Accurate recognition of market and its governing components
		Recognition of real needs
		Enjoyment of viral marketing
	Competitive factors	Objectives of the target market and the segmentation market
		Analysis of competitors' strengths
		Identification of competitive advantages
		Considering cyberspace as an opportunity
		Conveying the generated content easily and rapidly to the audience
		Continuous evaluation and correction of errors
		Differentiating the novel media space from the traditional space
		Recognition of the competitive areas in social media
	Managerial factors	Managers' risk-taking
		Managers' misunderstanding of the cyberspace
		Managerial stability
		Marketing knowledge and expertise of managers
		The administration and management's structure and model
		Managers' support of the audiences in social media
		Insufficient public budgets
	SM related factors	Emerging SMM
		Difficult supervision and full control of contents
		Identification of various new social media
		Sufficient recognition of cyberspace, its audiences and existing competitors
		Social media; opportunities and threats together
		Attractiveness of the social media
		Gaining of the audiences' trust through content
		Preventing news misuses
		Development and implementation of training programs in social media

served as a guiding beacon for the researcher.

From the interviewees' point of view, the main factors affecting SMM in cyberspace are as below: marketing factors (marketing mix including product, price, place and promotion; easy access to cyberspace; determining market share in various social media; content marketing in social media; durability of messages and advertisements; advertising methods; ways of introduction; accurate design of messages based on the audience's needs and desires; addressing the audience's needs and desires in a new business space; accurate recognition of marketing and the components governing it; powerful public relations; identification of audience's needs and expectations; recognition of real needs; familiarity with marketing methods; training the staff for marketing; considering an effective and durable presence in the market; understanding the difference between the real and cyber spaces in marketing; choosing the proper slogan and abiding by it; active presence of National Media in the marketing field; introduction of consumable goods, news, etc. in a clear and correct way; utilizing viral marketing; using all the capacities of SM in marketing; market segmentation and choosing the target market and the operational planning commensurate with the target market); competitive factors (analysis of competitors' strengths, identification of competitive advantages, considering cyberspace as an opportunity, conveying the generated content easily and rapidly to the audience, continuous evaluation and correction of errors, differentiating the novel media space from the traditional space, recognition of competitive areas in social media, monitoring the audiences' needs, a wise look at the competitive environment, accurate recognition of audience, attracting more audiences and competing the marketing by other networks in cyberspace); managerial factors (risk-taking, scientific and non-arbitrary performance of managers, marketing expertise and knowledge, stability, political use of brands, supporting audiences across the social media, familiarity with social media, insufficiency of public budgets, governance structures and managerial models, and lack of familiarity with the cyberspace); social and cultural factors (increased penetration rate of the social media, collective learning, society's culture governing on how to establish communication, increased media literacy across the country, necessity of understanding the appropriate culture in various kinds of social media, culturalization replacing the content supervision, promoting the intellectual and cultural level, raising the users' awareness, empowering the cultural activities and promoting the ethical values among the users); and SM related factor (emerging SMM, difficult supervision and full control of content, identification of various new social media, sufficient knowledge of cyberspace, its audiences and existing competitors, SM - opportunities and threats together, attractiveness of social media, being up-to-date, not taking the SM and its information seriously, attracting the audiences' trust through creating content, preventing the news misuses, development and implementation of training programs in social media, creativity and innovation in offering services, designing the internal SM and efficient use of SM and increased speed of activities.

In sum, results of interviews' analysis led to the identification of factors affecting the SMM in cyberspace and extraction of a model, as shown in Fig. 1.

Quantitative section

The quantitative section was conducted in survey method. The required data were obtained from 21 Likert scale questionnaires completed by the professors of Iran Broadcasting University and senior managers of this media. In this part, the priority of the components affecting SMM was determined based on the ANP multi-criteria decision-making technique. To perform the confirmatory factor analysis test of the research model, first the correlation relations of all the dimensions and components of the research model were tested. For this purpose, the Pearson correlation test was performed. The test results show that there is a correlation at a significance level of 0.01 between all the components of the model. Then, to measure the adequacy of the sample size and the appropriateness of conducting a factor analysis to confirm the model, the Kaiser-Meyer-Olkin (KMO) test (sampling adequacy index) was performed. Demonstrates the appropriateness of factor analysis to identify factor structure and model. As the KMO value is greater than 0.7, the sample size is adequate for carrying out the test and the significance test indicated the appropriateness of performing a factor analysis to identify the structure and model of the factor.

In this analysis, four factors were obtained using the Varimax rotation that had eigenvalues greater than 1 and their factor load values were greater than 0.49. Table 3 shows the eigenvalue, the percentage of the variance explained, and the cumulative variance percentage of each factor.

As shown in Table 3 these four factors account for 47.72% of the total variance for SMM.

The results of the factor analysis indicate suitable validity of all the model factors to be used as scales (Table 4).

Confirmatory factor analysis

In order to confirm the homogeneity of the items related to this scale in terms of content and underlying dimensions, a confirmatory factor analysis was performed on this scale. There are several indices for evaluating the fitness of factor analysis models. In this study, the Average Variance Extracted (AVE), compos-

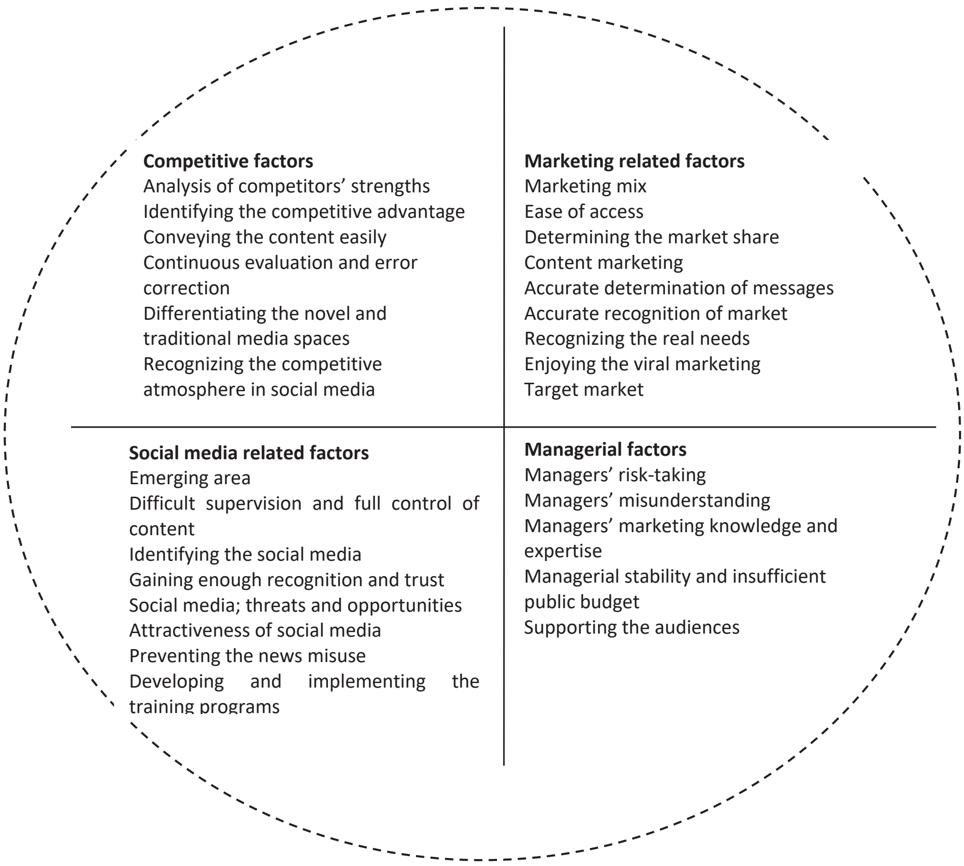

Fig. 1: Research framework

Table 2: The KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.739
Bartlett's Test of Sphericity	Approx. Chi-Square	248.589
	df	27
	Sig.	.000

Table 3: Exploratory factor analysis of factors affecting SMM in cyberspace

Factor	Eigenvalue	Variance explained %	Cumulative variance
Marketing-related factors	2.22	14.58	14.58
Management factors	2.11	14.08	28.66
Competitive factors	2.03	10.07	38.83
SM factors	1.89	8.99	47.72

Table 4: Results of the exploratory factor analysis with a varimax rotation of SMM

Items		Factor loading
Marketing mix	Item 1	0.91
	Item 2	0.88
	Item 3	0.94
	Item 4	0.90
Availability	Item 1	0.78
	Item 2	0.87
Determining the market share	Item 1	0.80
	Item 2	0.84
Accurate market knowledge	Item 1	0.91
	Item 2	0.88
Identification of actual needs	Item 1	0.77
	Item 2	0.78
Viral marketing	Item 1	0.84
	Item 2	0.96
Target market	Item 1	0.82
	Item 2	0.84
Managers' risk-taking	Item 1	0.88
	Item 2	0.90
Lack of understanding of managers	Item 1	0.95
	Item 2	0.74
Marketing expertise and knowledge	Item 1	0.77
	Item 2	0.84
Governance structures	Item 1	0.89
	Item 2	0.89
Managers' support of the audience	Item 1	0.73
	Item 2	0.67
Analysis of the power of competitors	Item 1	0.75
	Item 2	0.81
Identification of competitive advantages	Item 1	0.90
	Item 2	0.88
Considering the cyberspace	Item 1	0.75
	Item 2	0.74
Delivering the generated content	Item 1	0.68
	Item 2	0.87
Continuous evaluation and correction of mistakes	Item 1	0.71
	Item 2	0.70
Understanding the competitive environment	Item 1	0.73
	Item 2	0.83
Novelty	Item 1	0.80
	Item 2	0.74
Difficulty of monitoring and fully controlling the contents	Item 1	0.88
	Item 2	0.73
Gaining adequate knowledge and trust	Item 1	0.62
	Item 2	0.64
	Item 3	0.76
SM opportunities and threats	Item 1	0.87
	Item 2	0.85
Attractiveness of the social media	Item 1	0.72
	Item 2	0.70
Preventing misuse of the news	Item 1	0.88
	Item 2	0.68

ite reliability and the Cronbach's alpha have been used.

The AVE, composite reliability and the Cronbach's alpha are used as indices to evaluate the validity of the model. As mentioned, the results show that all of the above values are higher than the desirable values (Table 5).

Fig. 2 shows the path coefficients that indicate the strength of the linkage between the variables. The numbers on the paths represent the path coefficients and those inside the circles indicate the endogenous variables the value of the coefficient of determination (indicating the effect that independent variables have on a dependent variable).

Ranking factors affecting SMM with ANP

Once it was established that marketing-related, competitive, managerial and social media-related factors were among the factors influencing SMM, we applied the multi-criteria decision-making Analytic Network Process (ANP) to rank and prioritize the factors based on their impact. ANP is one of the decision-making techniques that are very similar to the AHP method, and in fact, it is an extended version of it. In cases where the lower levels affect the higher levels or the elements that are on the same level are not independent of each other, the AHP method can no longer be used.

Table 7 shows that the marketing-related factor has the highest ranking, the managerial factor is in the second place, competitiveness is in the third place and SM is in the fourth place. According to the results, marketing-related factors are the most important in social media marketing in urban cyberspace; hence, detailed marketing plans should be developed to promote activities in cyberspace. Morris and James (2017) found that although there are limitations in using the social media, this media creates advantages for companies which can utilize the opportunities to deliver their products directly to the audiences. Using the Grounded Theory, Khalouzadeh Mobarakeh *et al*. (2019) designed a model for experience promotion and customer response by making use of SMM in which the categories of time management, cost management, leisure management and the social influence are the causal factors leading to customer's participation and use of SMM; these categories lead to the customer's experience and response through the current study strategies, i.e. capabilities of social media, customer dynamics and perceived value. Boon-long and Wongsurawat (2015) stated that the effectiveness of SMM is so hard to measure and this measurement is not conducted systematically.

CONCLUSION

This study aims at identifying the factors affecting the SMM in cyberspace which was conducted based on the theme analysis approach. On the basis

Table 5: Reliability and validity indicators

Factor	Average Variance Extracted (AVE) (Minimum desirable value higher than 0.5)	Composite reliability (Minimum desirable value higher than 0.7)	Cronbach's alpha (Minimum desirable value higher than 0.7)
Marketing mix	0.78	0.88	0.83
Availability	0.64	0.91	0.91
Determining the market share	0.59	0.90	0.86
Accurate knowledge of the market	0.55	0.75	0.87
Identification of actual needs	0.74	0.78	0.72
Viral marketing	0.80	0.80	0.90
Target market	0.69	0.88	0.83
Managers' risk-taking	0.70	0.81	0.79
Lack of understanding of managers	0.52	0.79	0.76
Marketing expertise and knowledge	0.77	0.75	0.84
Governance structures	0.71	0.84	0.76
Managers' support of the audience	0.66	0.80	0.70
Analysis of the power of competitors	0.63	0.71	0.72
Identification of competitive advantages	0.69	0.74	0.77
Considering the cyberspace	0.71	0.92	0.83
Delivering the generated content	0.75	0.89	0.80
Continuous evaluation and correction of mistakes	0.74	0.90	0.90
Understanding the competitive environment	0.70	0.94	0.75
Novelty	0.69	0.86	0.72
Difficulty of monitoring and fully controlling the contents	0.84	0.79	0.87
Gaining adequate knowledge and trust	0.73	0.76	0.85
SM opportunities and threats	0.63	0.77	0.73
Attractiveness of the social media	0.55	0.86	0.76
Preventing misuse of the news	0.57	0.73	0.80

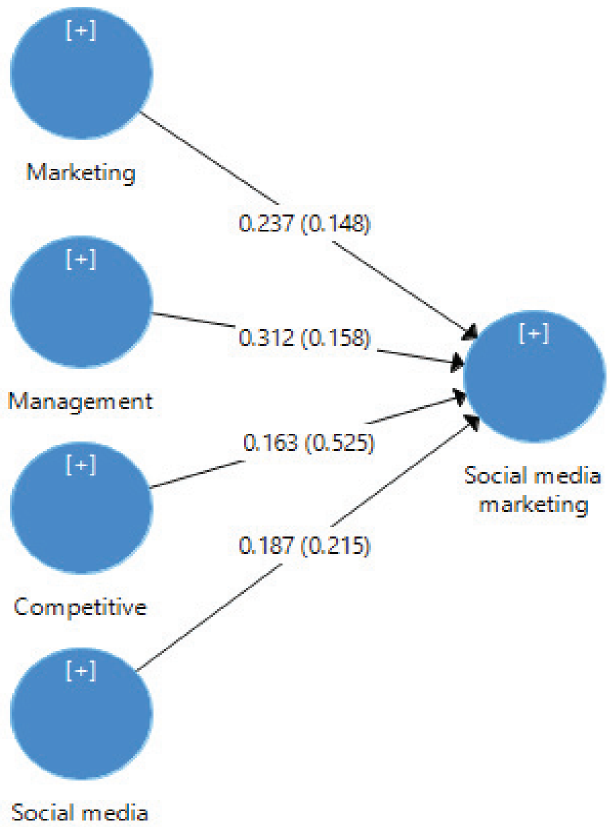

Fig. 2: Standardized path coefficients of the four-factor structure of SMM

Table 6: Ranking the factors affecting SMM by analyzing path coefficients in PLS

Path	Path coefficient	Ranking
Marketing-related factors	0.237	1
Competitiveness	0.163	4
Managerial	0.312	2
Social media	0.187	3

Table 7: Ranking factors affecting SMM with ANP

Factor	Weight	Ranking
Marketing-related factors	0.16902	1
Competitiveness	0.13856	3
Managerial	0.16349	2
Social media	0.13345	4

of themes extracted from the interview in connection to the SMM, 248 key concepts were categorized within 32 initial codes, 1 subtheme and 4 main themes. Based on the results of qualitative analysis for the studied part to apply the factors affecting the SMM, the following suggestions are offered. As it is evident, the urban cyberspace has durability, accessibility and timely feature in its own capacities which can help significantly to advance the media objectives. To promote quality and quantity of its audiences and find more audience, from one hand, and to enhance the audiences' trust, their dependency, their needs as well as its image in their minds, on the other hand, Islamic Republic of Iran Broadcasting (IRIB) should initially take a serious step in audience analysis stage to design a media product and enjoy the cyberspace. Furthermore, to recognize better and more accurate and personalize the audience, IRIB can use the data generated in social media; in other words, based on the classification of audiences within various groups and categories relying on the pre-defined characteristics, IRIB can generate content for them based on the more real recognition of the audiences. The proliferation of social media creates an amazing opportunity for companies and brands to look for new interactive ways to reach their customers. This rapidly expanding SMM channel should not be used as a stand-alone marketing strategy; rather, it should be used as the final step in the strategic marketing process; improve other digital marketing communications such as corporate websites. In addition, the rapid development of information and communication technology, communication through the Internet and the existence of high-speed Internet have increased the penetration of the Internet. This increase represents the percentage of the population of a country or region that uses the Internet. This provides a good opportunity for social media marketers to connect with this vast market easily. On the other hand, the research results indicate that the ease of access and persistence of messages and advertisements in this field has caused many customers and customers of commercial advertisements to use the capabilities of cyberspace. Therefore, paying attention to the category of marketing in cyberspace and its large and widespread presence in this space is very important and vital for traditional media. It is worth noting that cyberspace has a constant availability and availability in its capacities, which can help in advancing the goals of the media. Finally, due to the emergence of social media and new communication structures in cyberspace and competition with national media in attracting audiences and increasing influence and influence on cultural, political, social, economic and other areas of human societies. The national media has no choice but to recognize these new media and use them to achieve their goals.

SUGGESTIONS

Nowadays, since the main advertisements of companies are performed via the websites and social media, the best media in commensurate with the product should be selected by recognizing the interests and values of target audiences to establish communication with them. The legal organization in IRIB is a structure which, if formed properly, can protect both the products and contracts with celebrities. The organization should seek more to establish an independent and real group to make money and focus its mechanisms on legal channel rather than to use its business group. In fact, a legal structure should be determined for these products which form the cyberspace so that the products are arranged properly. It is here that a powerful legal complex helps significantly an organization to be arranged in urban cyberspace and structured well. Presence of media in novel communication space with its general and special audiences is an opportunity which should not be ignored by the National Media. Compared to the commercial advertisements in various radio and TV channels, Marketing in this atmosphere is likely to make less money (particularly at the early days), but such presence is highly significant. Consequently, if the owners of goods and services choose the platforms of National Media for advertising their goods and services, the message beyond this selection results in trust in IRIB which is considered a capital for each media. An important factor in background factors of National Media marketing framework is the competition; if there is no competitor, we do not know what to do. Currently, competition in cyberspace has risen significantly over other media. As a result, it is suggested that a website like Divar should be available through which the advertisements are attracted and the media managers have identify the issues of value, money-making, content, strengths, opportunities and threats and design a (invasive) strategy for it.

LIMITATIONS

Entirety, the considerable point in domestic studies is that the questionnaires already designed by the foreign researchers are used to investigate the relationship among the different variables of SMM and brand equity and only a few have examined the factors affecting the SMM and this research contributed to developing the research area. One limitation of this study is that expressing all experiences and personal opinions of interviewed managers is not possible due to the personal consideration and self-censorship and fear of information disclosure. At last, accessing the interviewees and allocating time with regards to the COVID-19 pandemic across the country were limited and since we needed to interview the professors of Iran Broadcasting University, the interviewees, especially the experts, the time allocation for interview faced limitations. It is suggested that in-depth qualitative studies be conducted on each of the factors identified in this study separately. Also, conducting this research in a different context such as specific sectors of the industry and comparing the factors affecting social media marketing in the private and public sectors can be helpful in advancing the literature in this field.

AUTHOR CONTRIBUTIONS

Y. Vakil Alroaia performed the literature review, experimental design, analyzed and interpreted the data, prepared the manuscript text, and manuscript edition. M. Montezarhojat performed the experiments and literature review, compiled the data and manuscript preparation. A. Rashidi helped in the literature review and manuscript preparation. Vakil Alroaia performed data correction, writing original draft preparation, writing reviewing and editing references.

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CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

PUBLISHER'S NOTE

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ABBREVIATIONS

ANP	Analytic Network Process
AVE	Average Variance Extracted
IRIB	Islamic Republic of Iran Broadcasting
KMO	Kaiser-Meyer-Olkin
SM	Social media
SMM	Social Media Marketing
SM	Social Media

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ORIGINAL RESEARCH PAPER

The effect of leadership's communication ability on quality of work-life and employees job satisfaction

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ABSTRACT

BACKGROUND AND OBJECTIVES: Job satisfaction is important to improve the effectiveness and efficiency of bank employees. Moreover, quality of work-life and leadership's communication ability are also required to increase their productivity.
METHODS: This research was conducted to investigate the effect of leadership's communication ability on the quality of work-life and employees job satisfaction. A quantitative approach was adopted using a survey method with the employees of the local bank in Magelang in Indonesia used as the respondents. Moreover, data were collected using a questionnaire as the research instrument and analyzed through the means of path analysis.
FINDINGS: Leadership's communication has a positive effect on the quality of work-life with a standardized coefficient of 0.928 and sig. 0.000 < 0.05 and this means the influence is significant by 86.11%. The quality of work-life influenced the employees' job satisfaction with a standardized coefficient of 0.451 and sig. 0.032< 0.05 and this means the effect is significant by 20.34%. Leadership's communication directly influenced employees job satisfaction with 0.460=21.16% and sig. 0.029 < 0.05 and indirectly through the intervening or mediating variable of quality of work-life by P2 x P3 (0.928 x 0.451= 0.4185 or 41.85%). Therefore, the total effect of leadership's communication on the employees job satisfaction were found to be 0.460 + 0.4185 = 0.8785 which means the significance of the influence is 87.85%.
CONCLUSION: The results showed leadership's communication influences the employees' job satisfaction directly and also indirectly through the mediation of the quality of work Life. Communication was also observed to have a positive significant effect on the quality of work-life and this subsequently affected the job satisfaction of employees positively. The results of this research increase and improve the quality of leadership's communication patterns to enhance employee's job satisfaction and quality of work-life.

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INTRODUCTION

Communication plays an important role in the life of an organization by creating a social interaction process. Effective communication happens through the exchange and sharing of information between two or more people. Successful communication is experienced when the message sent by the sender is meaningful and understood by the receiver (Subanci *et al.,* 2016). This can, however, be verbal and non-verbal and is considered very important to how people express their minds, ideas, feelings, and knowledge. This means communication is fundamental to all humans (Sutiyatno, 2018). Moreover, the ability of a leader to communicate is related to the effective use of resources to execute strategies, making accurate decisions, and creating value. It has also been reported that a leader needs to have strong communication skills due to its importance in managing and leading people (Zulch, 2014). This specifically means there is a need for the leader to communicate and coordinate all people both internally and externally considering the importance of interpersonal relationships to leadership. This is, however, related to the Quality of Work-Life (QWL) which has been explained to the conditions and atmosphere of a workplace with the ability to increase employee satisfaction through job security and an adequate reward system. This concept covers several aspects such as the working conditions, health hazards, payments as well as the behavior, and the way the leadership communicates to meet the needs of the employees (Muindi and K'Obonyo, 2015; Ince, 2018). QWL of a bank has a positive impact on the commitment of the organization as well as the job satisfaction and performance of employees. It also enables the employees to work productively due to the comfortable feeling they experience based on the conducive atmosphere provided by the leadership. Moreover, QWL encourages the autonomy of workers as well as more effectiveness and efficiency, commitment, loyalty, and dedication. It has also been reported in a previous study that satisfied employees usually perform with higher motivation and this mostly leads to higher productivity and customer satisfaction (Butt *et al.*, 2019). The job satisfaction of employees is closely related to their performance, positively influence organizational performance and productivity, and these further affect the profitability of the company. It was also reported to be important in improving the quality of services provided to customers (Latif *et al.*, 2013).On the contrary, the inability of several business organizations to understand the importance of quality of work-life in improving the job satisfaction of their employees usually leads to several problems. This condition makes the company internally weak, unable to compete in the market, and unable to satisfy its customers (Sree and Satyavathi, 2017).On the other hand, Blanchard (2007) stated that leader should not only build communication to provide quality of work-life and job satisfaction but also creates energizing systems to increase a high performance of organization. This research has an important and strategic role because it was conducted in a small bank classified as a Small Medium Enterprise (SME). Leaders of these SMEs, sometimes pay less attention to the role of communication in carrying out organizational functions and focus more on the targets to be achieved without providing the right strategies needed to achieve these goals. Several studies discuss and focus on leadership and communication styles and models only as attributes and elements of abilities possessed by a leader. However, this research places the leadership's communication variable as a style, Just in addition to the attributes and elements. Furthermore, it aims to reveal the role of leadership's communication as a style and its effect on job satisfaction of employees by mediating the quality of organizational life. This research plays an important role to contribute the leaders to develop and improve their communication ability.

Leadership's communication ability

Every organization, including banks, considers communication as an important concept to improve performance and productivity. Moreover, communication competence and effectiveness have been basically discovered to include knowledge, skills, and behaviors that can be learned to create social interaction. This was reported to have been applied in several areas such as business, leadership, human-computer interaction, and conflict (Nickitas, 2019). Leaders, directly and indirectly, manage internal communication in their organization by introducing a program and the strategy for its successful implementation to the employees which are expected to support the process and build a sense of trust and loyalty towards the organization (Ophilia and Hidayat, 2021). There are two types of communication and these include verbal which involves the use of language and non-verbal which includes the application of expression, gestures, action, and others in passing information (Rawat, 2016). Moreover, leadership's communication either verbally or non-verbally has been discovered to be very crucial to building the quality of work-life and employee's job satisfaction in the banking sector. However, Luo *et al.* (2016) analyzed differently how leaders communicate effectively to encourage change, commitment to the process of change, and reduce their subordinates' fear of change and found the need to create a quality environment for the employees to perform their functions towards achieving the goal of the organization. A qualified leader manages employees with an appropriate attitude to achieve organizational objectives (Nanjundeswaraswamya and Swamy, 2013). One of the most important qualities required of a good leader is communication skills (Răducan and Răducan, 2014). Meanwhile, Zulch (2014) also confirmed through Kuria (2019) that it is necessary to figure out and improve relations between the leaders and employees and this further indicates the expediency of the leaders' communication model. On the other hand, Shah (2018) showed the effect of social communication skills on the emergence and effectiveness of a leader. This means a leader needs to be conscious of the factors associated with establishing relationship, symbolic communication, body language, and cognitive complexity to implement an effective strategy. Moreover, there is a direct relationship between verbal communication and customer satisfaction. The communication style of a leader has also been discovered to be very important in motivating employees and the whole workforce in an organization to be more productive. Based on the explanation above, it is concluded that communication plays an essential role in an organization, including the banking sector. Therefore, leaders need to always develop their verbal and nonverbal communication skills. In this research, the position of leadership's communication skills as an independent variable has a vital role in creating quality of work-life and job satisfaction of employees.

Quality of work-life

Most employees increase their job performance through constructive suggestions on their area of expertise and recommendations for jobs done effectively. They develop their career to ensure better effectiveness in performing their duties. Quality of work-life is related to several other outcomes for the employees such as job satisfaction, an opportunity of career growth, psychological development, job security, job enrichment, and participatory management, interpersonal relationship with the employer, secured working environment, and low levels of work accidents. It is also connected with the plan to change an organization for the better (Osabiya, 2015; Mamaghaniyeh *et al*., 2019). The fundamental concept of QWL is based on the belief of employees that an organization has the capacity to meet their needs and this keeps them satisfied with their job (Butt *et al*., 2019). Conversely, several employees are not satisfied with the quality of their work-life and this usually affects their performance negatively. This means it is necessary for the leaders to provide a quality environment for their employees and one of the best ways to achieve this is through the improvement of interpersonal relationships between the employer and employees. Moreover, Asegid *et al*. (2014) showed that several organizations focus on increasing their staff satisfaction and management. On the other hand, it has also been discovered that QWL is very important to the development and empowerment of employees (Lee *et al*., 2015) due to its ability to improve organizational and employee efficiency. QWL is often used as a model to plan organizational change (Osabiya, 2015). It is usually focused on factors associated with the efficiency and productivity of an organization and directed towards achieving the projected outcomes. In addition, Rabins and Black (2007) also showed that the concept covers several programs arranged to implement changes in an organization due to its ability to provide the management with meaningful and productive information needed to improve the productivity of employees (Wynne-Jones *et al*., 2011). Moreover, it is also a bridge used in ensuring job satisfaction of employees based on salary and having effective and efficient co-workers and supervisors (Rozbehani *et al*., 2016). Therefore, based on the theories above, QWL as a mediating variable plays an important role in increasing job satisfaction of employees in order to increase their productivity, satisfaction, comfort and efficiency at work. Meanwhile, QWL is built when a leader has the ability to build constructive interpersonal communication to create a quality work-life.

Employee's job satisfaction

Employees are very important to the execution and achievement of an organization's mission and vision. They are required to meet certain performance standards determined by the organization as regards the quantity and quality of their job description. The organization also needs to provide a conducive and quality environment to enable them to work freely without problems with the ability to hinder their potential competence (Raziq and Maulabakhsh, 2015; Dziuba *et al*., 2020). Employee satisfaction reflects the attitude of an individual towards a job based on the difference between the level of rewards received and the expected reward. This shows it is mainly focused on attitude rather than the behavior which is centered on human needs and the ability of their job to fulfill those needs. Job satisfaction is based on the perception of an employee concerning the ability of the job to satisfy fundamental needs. Moreover, a previous study showed that the need for satisfaction promotes high productivity (Saranya, 2014). On the other hand, it has been discovered that a satisfied employee usually has better performance (Dziuba *et al*., 2020).Moreover, Employees Job Satisfaction (EJS) is based on work performance, work-life satisfaction, productivity, and motivation (Abuhashesh *et al*., 2019), and these further influence their security in an organization. This shows the concept is closely related to work productivity and, consequently, the profitability of the firm. It also affects the performance of an organization positively through the improvement in the quality of goods and services. This shows that employee satisfaction is very important to achieving the objectives and mission of an organization (Latif *et al*., 2013). Meanwhile, Wolniak and Olkiewicz (2019) also reported satisfied employees have a comfortable feeling with their company and this is reflected in their better performance. This is believed to be the reason for the significant importance of job satisfaction to work safety. Motivation and job satisfaction have some influence on the performance of employees. Similarly, the perception of employees towards their organizations and their performance are believed to be correlated to their job satisfaction. It is also important to note that the attitude and feelings of people towards their work are positively correlated to job satisfaction and motivation. This summarily means a positive attitude towards the job leads to job satisfaction while a negative attitude causes dissatisfaction (Abdolshah *et al*., 2018). Further, employees tend to increase their productivity, efficiency, and performance, when satisfied and comfortable with the working environment. Therefore, job satisfaction is a dependent variable realized through the support of leadership and QWL communication skills. This research objectives was conducted to reveal the effect of leadership's communication ability on the quality of work-life and employees job satisfaction. The current study have been carried out in BKK local bank in Magelang Indonesia on July 2020 up to April 2021.

MATERIALS AND METHODS

This research was conducted through a survey method with a multi-analysis approach using BKK Bank which is a local bank owned by the local government of Magelang Municipality as the research object. This research used the entire population as a sample due to the small number of population sizes. The population consists of 38 employees and they were all used as samples with 22 males (58%) and 16 females (42%). Data were collected using questionnaires as a research instrument and analyzed through means of path analysis. Questionnaire of Leadership Communication is measured by using The Perceived Leadership Communication Questionnaires (PLCQ) (Schneider *et al*., 2015). Then, Quality of Work-Life was adopted from Cascio (1986). Then, Employees Job Satisfaction was measured by means of The Minnesota Satisfaction Questionnaire (MSQ) (Luthans, 2006). The validity, reliability, and normality of the questionnaires, were measured before it was distributed. Furthermore, the loading factor, Cronbach's alpha and Saphiro-Wilks were used to measure the validity, reliability, normality and values, and analyzed using the SPSS version 24. Meanwhile, sampling adequacy was measured by KMO and Barlett's Test (The result of test assumption). Moreover, Leadership's

Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.500
Bartlett's Test of Sphericity	Approx. Chi-Square	69.859
	Df	1
	Sig.	.000

Table 2: Summary of Validity Test

Variables	Alpha Cronbach	Category
Leadership Communication	0.802	Acceptable
Quality of Work Life	0.845	Acceptable
Job Satisfaction of Employees	0.862	Acceptable

Table 3: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Leadership Communication (X1)	.120	38	.180	.887	38	.112
Quality Of Work Life (X2)	.179	38	.359	.897	38	.212
Job Satisfaction Of Employees (Y)	.215	38	.115	.851	38	.136

a. Lilliefors Significance Correction

Communication (LC) (X1) and Quality of Work Life (QWL) (X2) were used as the independent variables while Job Satisfaction of Employees (JSE) (Y) was used as the only dependent variable.

RESULTS AND DISCUSSION

Test of Assumption

Factor Analysis

Based on the result of sampling adequacy, KMO was 0.500, it confirmed that the sample was appropriate. Meanwhile, Barlett's Test of Sphericity value 69.859 with significant 0.000, it explained that the data were sufficient to evaluate for the factor analysis as shown in Table 1.

a. Validity and Reliability Test

Validity means a test has the ability to measure what it is designed to measure. This research adopted factor analysis which was used to ensure each question item was classified in the predetermined variables. The result showed that all the questions items used in this research were valid based on their loading factors which were greater than 4.0.Alpha Cronbach was used to measure reliability such that the alpha values between 0.8-1 were interpreted as good, 0.6- 0.79 were categorized as acceptable while those below 0.6 were poor (Sekaran and Bougie, 2010). The alpha values of leadership communications 0.802, Quality of Work-Life 0.845, and Employees Job Satisfaction 0.862 were categorized good and acceptable. The results from this research are presented in the following Table 2.

b. Normality

Saphiro-Wilk was used to measure normality and the information presented in Table 3 shows all variables have normal distribution based on the asymp. Sig. (2-tailed) value which is > 0.05

c. Test of Linearity

Table 4 shows there is a linear relationship between Leadership Communication (X1) and Job Satisfaction of Employees (Y)

Table 5 also shows a linear relationship between Quality of Work Life (X2) and Job Satisfaction of Employees (Y).

d. Path Analysis Results

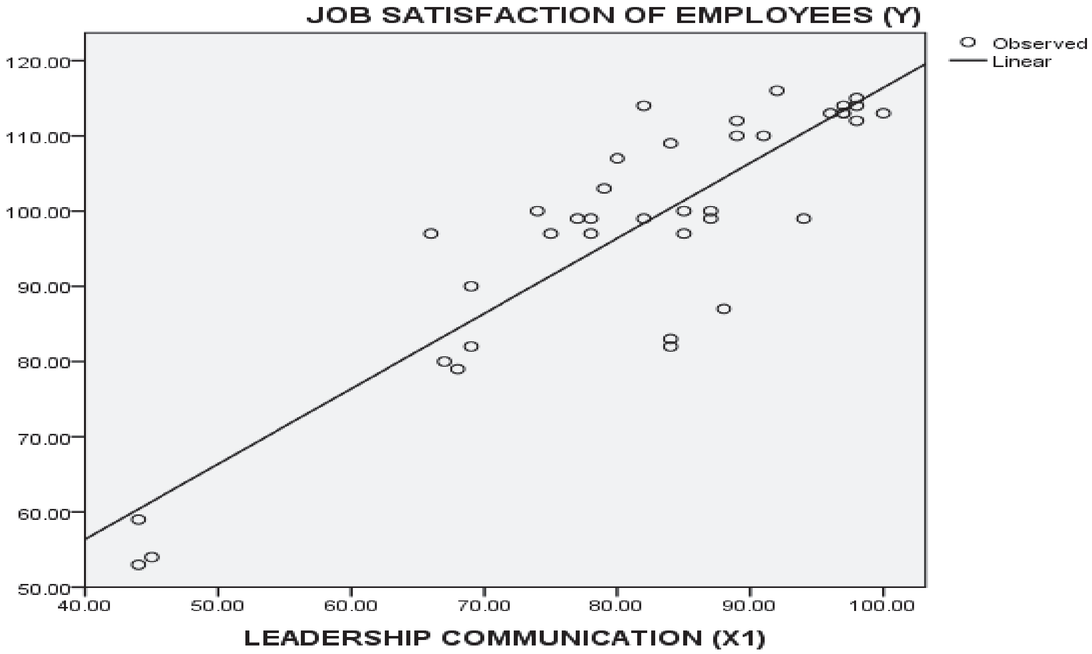
The effect of leadership's communication on the quality of work-life and its subsequent impact on job satisfaction of employees is visualized as follows (Fig. 1).

Fig. 1 shows the influence of the leadership's communication on the job satisfaction of employees by 0.460 or 21 %. It also shows its indirect effect through the use of quality of work-life as an

Table 4: Model Summary and Parameter Estimates

Dependent Variable: Job Satisfaction Of Employees (Y)							
Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b1
Linear	.772	122.216	1	36	.000	16.359	1.000

The independent variable is Leadership Communication (X1).



intervening or mediating variable by P2 x P3 (0.928 x 0.451= 0.4185 or 41.85%). Therefore, the total direct effect of leadership's communication on the job satisfaction of employees and its indirect influence through the quality of work Life was found to be 0.460+0.4185= 0.8785= 87.85 %. This analysis showed the hypothesis was empirically proven. This was observed in the coefficient of sig < 0.05 which confirmed that leadership's communication empirically influenced job satisfaction of employees directly and indirectly through the mediation of quality of work-life as shown in Table 6.

The observations from Table 6 are stated that Leadership's communication has a positive effect on the quality of work-life with a standardized coefficient of 0.928 and sig. 0.000 < 0.05 and this means the influence is significant by 86.11%. quality of work-life influenced the employees job satisfaction with a standardized coefficient of 0.451 and sig. 0.032< 0.05 and this means the effect is significant by 20.34%.Leadership's communication directly influenced employees job satisfaction with 0.460=21.16% and sig. 0.029 < 0.05 and indirectly through the intervening or mediating variable of quality of work-life by P2 x P3 (0.928 x 0.451= 0.4185 or 41.85%). Therefore, the total effect of leadership's communication on the employees job satisfaction were found to be 0.460 + 0.4185 = 0.8785 which means the significance of the influence is 87.85%.

Discussion

a. Effect of Leadership's Communication on QWL

The results showed leadership's communication influenced QWL by 0.928 or 86% and this means leadership's communication has a significant role in creating and providing a better quality of work-life for employees. This shows that a leader needs to be able to build an efficient interpersonal communication mechanism within the organization to increase the comfortability of the working

Table 5: Model Summary and Parameter Estimates

Dependent Variable: Job Satisfaction Of Employees (Y)							
Equation	Model Summary					Parameter Estimates	
	R Square	F	df1	df2	Sig.	Constant	b1
Linear	.771	121.445	1	36	.000	16.254	1.006

The independent variable is Quality Of Work Life (X2).

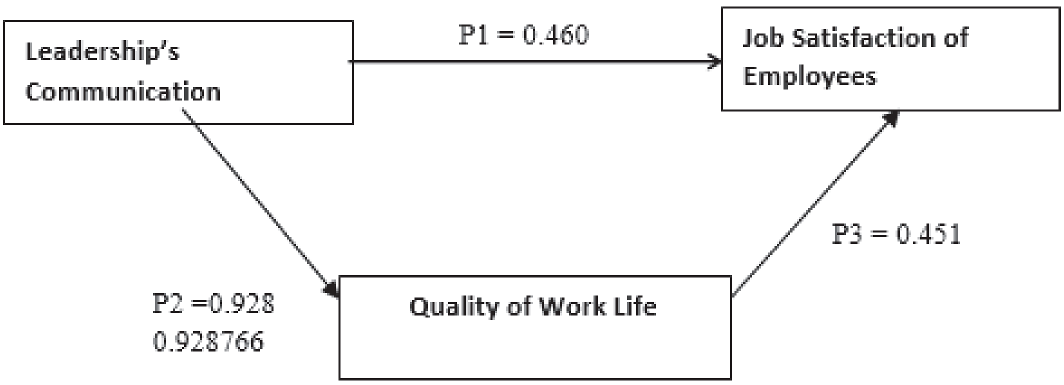


Fig. 1: Relationship structure of variables

environment for the employees. The finding is in line with the result of Luo *et al*. (2016) that interpersonal communication is an essential part of leadership life. In addition, Andrew *et al*. (2019) revealed that leadership styles gave a significant role on QWL. Therefore, it is mandatory to understand the behavioral patterns of the communicator in order to build the most effective and productive working

Table 6: Results of Analysis

No.	Independent	Dependent	Unstandardized Coefficient		Standardized Coefficient	T	Sig
			B	Std. Error	Beta		
1.	Leadership's Communication	Quality of Work Life	0.921	0.062	0.928	14.889	0.000
2.	Quality of Work Life	Job Satisfaction of Employees	0.517	0.231	0.451	2.237	0.032
3.	Leadership's Communication	Job Satisfaction of Employees	0.524	0.230	0.460	2.281	0.029

relationship. An interpersonal relationship involves the ability to understand, communicate, and cooperate effectively with individuals and groups to ensure productivity (Oberer and Alptekin, 2018). Moreover, the positive influence of the dimensions of QWL such as work environment, communication and cooperation, and work autonomy on leadership style (Rao *et al*., 2018). Human resource is absolutely very essential in an organization due to the influence of its unlimited capacity in achieving the objectives of the organization. This means a leader needs to search for methods to build a quality environment for staff to perform optimally, efficiently, effectively, and productively (Ehnert and Harry, 2012; Mamaghaniyeh *et al*., 2019). The leader communicates to improve employees' motivation and this further helps in building a productive workforce (Shah, 2018). A leader needs to be able to build constructive communication with employees to increase their level of trust, improve performance, motivation, quality of interaction, and communication, thereby achieving the organizations vision and mission. This finding is in line with the studies carried out by Son *et al*., (2014), Wikaningrum and Yuniawan (2018), Abuhashesh *et al*. (2019), and Madlock (2008). The importance of communication is in different contexts, especially in a culturally diversified workplace where the relationship between the employees is improved to ensure they work effectively and efficiently. Moreover, (Madlock, 2008) confirmed that leadership described through communication has both assignment and relational components which when utilized effectively has the ability to generate higher levels of employees' satisfaction. Sree and Satyavathi (2017) also challenged organizations to focus on building a work environment with the ability to increase the productivity of employees in order to maximize profits. The employees' perception of a leader's support determines their contribution to the business. Moreover, human-focused businesses require that the leaders focus on the thoughts, feelings, and hopes of the employees (Pelenk, 2020).This research revealed that leadership's communication has a significant effect on QWL, meaning that a leader need to improve and build QWL continuously to increase the job satisfaction, work motivation, cooperation and productivity of employees more effectively to maximize profits. It is in line with the research carried out by Luo *et al*. (2016), Oberer and Alptekin (2018), and Mamaghaniyah *et al*. (2019). Furthermore, this research found that leadership's communication has a significant effect on the job satisfaction of employees. The inverse of finding of this research, QWL gave an influence on the leadership style (nanjundeswaraswamya and Swamy, 2015). Based on the discussion above, the previous findings did not explain and confirm the finding of this research clearly and completely that of leadership's communication gave an effect on the QWL.

b. Quality Work-Life on Job Satisfaction of Employees

The result showed the quality of work-life influenced job satisfaction of employees by 0.451 or 20.34 % and this means a leader needs to understand the importance of QWL in satisfying the employees in order to provide the positive climate needed to increase their productivity. This is necessary due to the ability of the QWL to improve the identity of an organization, engagement, organizational commitment, and employees' job satisfaction, workload, and performance. It reduces absence, turnover intentions, and turnover of the organization and also increases the welfare and independence of employees (Grote and Guest, 2017). This, therefore, means QWL influences the efficiency and effectiveness of both the organization and employees based on the fundamental concept that employees are aware the organization has the ability to meet their needs (Lee *et al*., 2015). Similarly, the results of this research prove that QWL has a positive effect on the job satisfaction of employees in terms of performance, commitment, cooperation, efficiency, effectiveness, and decrease in turnover and absences. This finding is in line with the research by Lee *et al*., (2015), Grote and Guest (2017), Rao *et al*., (2018) and (Dziuba *et al*., 2020). Conversely, bad QWL causes employee dissatisfaction and has a negative impact on their performance (Griffin, 2007). However, this is not in accordance with the research conducted by Evans and Lindsay (2013), which stated that productivity downturns and product quality decline in organizations due to shortcomings in the quality of work-life and changes in employee preferences. On the contrary, leadership style and job satisfaction cannot significantly influence employee performance in the Regional Revenue Agency of East Java, Surabaya (Purnomo *et al*., 2021). QWL is correlated with job satisfaction, job security, productivity, motivation, health, and safety. It provides benefits for both employees and management through a mutual resolution of work-related problems, cooperation, efficient work climate, and conduct of assignment carefully and objectively through the use of human resource outcome and payoffs (Rao *et al*., 2018). QWL also enables training opportunities, job satisfaction, and conducive working condition for the employees. This, therefore, means a better QWL has the ability to develop employees in line with the growth of an organization (Rao *et al*., 2018). Martin and Roodt (2008) stated that job satisfaction positively affects the evaluation of employees regarding all dimensions of an organization as a qualified working environment (Tajpour *et al*., 2021). According to Griffin (2007), QWL ranks life satisfaction as the first, job satisfaction as the second, and satisfaction with other aspects of work such as income, co-workers, and supervisors as the third. This shows its importance is beyond the satisfaction of the employees with their job (Rozbehani *et al*., 2016). Moreover, the QWL index creates valuable and productive information required to increase the productivity of employees (Wynne-Jones *et al*., 2011). The other functions of QWL which are able to enhance satisfaction and learning of employees and which provides support for change and evolution are beliefs and attitudes. On the contrary, the dissatisfaction of employees with the quality of their work lives has the ability to create negative impacts on the organization (Griffin, 2007). Moreover, the QWL concept is related to the philosophies of the organization created to ensure employee development, change in organizational culture, and the development of physical and organizational skills (Mamaghaniyeh *et al*., 2019). It is majorly focused on the core dimension of an organization through the increment in the welfare and productivity of employees. Moreover, employees' job satisfaction is defined as the extent to which a working environment has the ability to match the needs and value of the employees as well as their response to such environment (Lambert, 2004; Tewksbury and Higgins, 2006; Babalola, 2016). Experts in the theory of organization and leadership found job satisfaction to be affected by several organizational factors such as job security, condition of workplace, leadership, and others. Furthermore, leadership style has also been reported to have a positive influence on employees' job satisfaction, productivity, and commitment (Çetin *et al*., 2012). This means satisfied and happy employees perform their tasks better, are considered more responsible, and feel like part of an organization (Dziuba *et al*., 2020). Conversely, workplaces are generally experience low productivity due to the employee's dissatisfaction with the quality of life. Therefore, organizations need to increase employee's satisfaction at all levels (Asegid *et al*., 2014) in (Mamaghaniyeh *et al*., 2019).

c. The direct and indirect effect of leadership's communication on JSE.

Leadership's communication was found to have a positive effect on job satisfaction of employees directly by 0.460 or 21% and indirectly by 0.928 x 0.451= 0.4185. This, therefore, means total influence was significant by 0.460 + 0.4185= 0.8785 or 87.85%. The research revealed a direct positive influence of leadership's communication and an indirect influence on the employee's job satisfaction through the mediating role of quality of work life. This was observed to be in line with the research of Wikaningrum and Yuniawan (2018) which showed the leadership styles and communication skills of leaders positively influenced employees' job satisfaction. Meanwhile, Abuhashesh *et al.* (2019) further stated that job satisfaction involves work performance, motivation, productivity, and satisfaction with work-life. The effective communication of the leader's vision has the ability to improve the employee's trust and this can further enhance their satisfaction in the job (Madlock, 2008). Subanci *et al*. (2016) also showed that managers use almost more than half of their time communicating either internally or externally. It is, however, possible for the organization to satisfy employees and their needs effectively and efficiently through the communication style and ability of its leadership (Babalola, 2016). In addition, Moestaina *et al*. (2020) revealed that leadership gave an effect on the job satisfaction. Employees' perception of leadership is focused on the objective of the task to be performed and the existing interpersonal relationship (Wikaningrum and Yuniawan, 2018). Meanwhile, Son *et al.* (2014) confirmed the possibility of improving job satisfaction and organizational commitment through the quality communication style of the leader. Moreover, the empowerment of employees by an organization is an effective way to improve their satisfaction in the job. On the other hand, Sree and Sayyavathi, (2017) the inability of several business organizations to understand the importance of quality of work-life in improving the job satisfaction of their employees usually leads to several problems. This condition makes the company internally weak, unable to compete in the market, and unable to satisfy its customers. In addition, it was discovered that employees dissatisfied with their quality of work-life usually cause problems that mostly spreads to other areas and levels of the organizations (Asegid *et al*., 2014). Furthermore, appropriate communicative skills due to effective interactions lead to better job performance. On the contrary, the inability of managers to interact effectively makes it impossible for the organization to perform outstandingly (Hosseini *et al*., 2020). Meanwhile, Madlock (2008) in Wikaningrum and Yuniawan (2018) confirmed that a leading figure with the ability to lead, manage, motivate, empower human resources, and communicate visions and mission effectively in an organization is very important to achieving a high level of employees' satisfaction. This was believed to be due to the contribution of these abilities to the development of constructive communication between the leaders and the followers. Communication is the basis for successful actions due to its capability to show the pathways to a more cooperative workplace. This is associated with the function of effective communication in information distribution, expectations, goals, ideas, feelings, and emotions in the context of coordinated actions. Moreover, communication is also one of the most crucial interpersonal processes in an organization and also assists employees and the organization to achieve their objectives (George and Jones, 2012; Subanci *et al*. 2016). Conversely, employees dissatisfied with their quality of work-life cause problems which spread to other areas and levels. Therefore, organizations are required to improve employees' satisfaction from the lowest to highest managerial levels (Asegid *et al.,* 2014). Further, Ibad (2014) also revealed different findings that leadership's communication did not give an effect on the job satisfaction. It has, however, been recently observed that more output is demanded from less input by business organizations and this usually affects the comfortability of employees in the work environment. Therefore, organizations need to build flexible work relationships between the employees and the workplace (Mamaghaniyeh *et al*., 2019).

CONCLUSION

This research was conducted to show the effect of leadership's communication on the quality of work-life and job satisfaction of employees. The results showed a direct positive influence of leadership's communication and an indirect influence on the employee's job satisfaction through the mediating role of quality of work life. This is an empirical confirmation of the essential role of leadership's communication in providing the quality of work-life required to satisfy employee's in their job. This means communication from leadership is very vital for the life and growth of an organization due to its significant role in the discharge of the responsibility of the leader both internally and externally. The ability of a leader to effectively manage communication within an organization usually leads to the creation of an appropriate quality of work-life which consequently provides a conducive environment for all the employees. This further has a positive influence on the performance of the organization, enhances job satisfaction, and motivates employees to work optimally. The result showed the quality of work-life influenced job satisfaction of employees. The research findings imply that a leader needs to understand the importance of QWL in satisfying the employees in order to provide the positive climate needed to increase their productivity. This is necessary due to the ability of the QWL to improve the identity of an organization, engagement, organizational commitment, and employees' job satisfaction, workload, and performance.

Employees 'job satisfaction involves work performance, motivation, productivity, and satisfaction with work-life. It is, however, possible for the leader organization to satisfy employees and their needs effectively and efficiently through the communication style and ability of its leadership. Employees' perception of leadership is focused on the objective of the task to be performed and the existing interpersonal relationship. The effective communication of the leader has the ability to improve the employee's trust and this can further enhance their satisfaction in the job. Finally, The possibility of improving quality of work-life and employees job satisfaction through the quality communication style of the leader. The theoretical implication of this research is the need to build a theory that places leadership's communication as a model based on communication or as a determinant variable to create the quality of work-life and employee job satisfaction. Therefore, this research is expected to contribute to the construction of a theory related to leadership's communication. The research has practical implications, namely a leader needs to be able to improve communication patterns to create the right quality of work-life, and increase employee performance satisfaction to increase work productivity and achieve company goals. There are some limitations inherent this research, such as the scope of both the object and the small population. Therefore, further research, need to be carried out by adding other similar objects such as consumer satisfaction and information technology with a larger population.

AUTHOR CONTRIBUTIONS

Sukris Sutiyatno performed conceptualization, literature review, methodology, analyzed and interpreted data, prepared the manuscript text, and manuscript edition.

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CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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ABBREVIATIONS

EJS	Employees job satisfaction
JSE	Job Satisfaction of Employees
LC	Leadership's communication
PLCQ	Perceived Leadership Communication Questionnaires
QWL	Quality of work-life
SME	Small medium enterprise

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ORIGINAL RESEARCH PAPER

Conceptual model of entrepreneurial talent management in organizations using structural equation approach

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ABSTRACT

BACKGROUND AND OBJECTIVES: Talent management is an emerging research field in human resource management which is vital for the survival and competitive advantage of the organization. Albeit many studies have been done on the component of talent management, yet so far the entrepreneurship segment has not been much considered in this field, and surprisingly an extensive model of entrepreneurial talent management in the organization has not been presented. Therefore, the purpose of this study is to present a conceptual model of entrepreneurial talent management in organizations.

METHODS: The present study is conducted with a mixed and exploratory approach in order to present a management model of entrepreneurial talent in 22 Districts of the Municipality of Tehran municipality in Iran. In the qualitative section, while reviewing the literature and research background, semi-structured in-depth interviews were conducted with 45 experts from Municipality of Tehran and university professors. In the quantitative part, the statistical population consisted of 450 managers and experts who have been working in the Municipality of Tehran from the beginning of 2019 to the end of 2020. The sample size was estimated to be 212 people according to the sampling of classified clusters through Cochran's formula and the researcher-made questionnaire consisting of 56 items was distributed among the statistical sample according to the qualitative part. Using Amus 22 structural equation software, the data were statistically analyzed in a quantitative section to analyze the path and test the hypotheses.

FINDINGS: In the qualitative part, by performing the process of coding and approval of experts by fuzzy Delphi method in two stages and expert response analysis to 11 components of perceptual skills, decision making, social intelligence, change leadership, consequentialism (performance management), people management, sustainability and accountability, adherence to ethical principles, complexity, recognition and focus and 57 indicators appropriate to these components were confirmed as influential factors in the model. In the quantitative part, the approved indicators were placed in the form of a questionnaire. Analysis of the questionnaire revealed that the complexity component, people management and decision making with 0.64, 0.63 and 0.61 had the highest factor load and the sustainability and accountability component with 0.5 had the lowest impact on the model, respectively.

CONCLUSION: The results of this paper show that this model depends on various variables and can be considered and used in technology-based programs in talent assessment centers. The results also showed that municipal managers must create a creative environment for employees to express their ideas and participate in decision-making, and this leads to improving and changing the attitude and behavior of employees.

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INTRODUCTION

Organizations today face ongoing, constant changes and intense competition. In the turbulent world and competitive environment among organizations, serious attention to human capital, as the main and valuable resource of the organization, has found its special place (Sabokro *et al.*, 2018; Shcherbak *et al.*, 2020). Competition between employers has also shifted from national to regional and global (Almond, 2011). Human resources, as organizational assets, require effective management that leads to the progress of the individual and the organization (Tajpour *et al*., (2020). In fact, in environmental conditions with little change, attention to human resource practices has little effect on the outcome of the organization, but under environmental conditions with many changes, the attention of executives to human resource practices has a great impact on the outcome of the organization (Ulrich, 1997). In response to this situation, it is claimed that organizations form and rely on self-management groups (Shippmann, 2000). In fact, human resource management is under pressure to reduce the cost of improving services, increase effectiveness and create a satisfying work experience for employees (Wilton, 2016). Organizations now compete based on the skills and talents of their employees and know that by attracting, developing and retaining the best and most talented employees, they can succeed in today's competitive environment. Therefore, human resources can and should add more value to the organization, and the best way is to be a partner of the organization to directly improve the performance of the organization, and this can be achieved through effective talent management (Tajpour *et al*., 2020). Lepak and Snell (2002) argued that given the pressures for flexibility and efficiency, the organization seeks to use distinct employment models in employing staff and job placement. Talent management, with the concept of managing people who have unique characteristics in terms of individual capabilities can help the organization achieve its goals (Krishnan and Scullion, 2017). Most management theorists consider talent management to involve attracting, developing, and retaining people with special abilities and skills (Mitosis *et al.*, 2021). The main purpose of talent management is to place the right people in the right jobs at the right time based on the strategic goals of the organization (Duttagupta, 2005). Talent management, by creating a creative environment for employees, leads to the emergence of constructive and new behaviors of employees, new proposals by them, creates opportunities for innovation and in fact causes the flourishing and development of talents (Martinaityte *et al.*, 2019). According to the analysis of talent management in the organization, inflexibility reduces the potential intellectual capital and also reduces the organization's competitiveness in the market, which in turn reduces the attractiveness of the organization (Babío and Rodríguez, 2010). An inner sense in people makes them use the opportunities and resources to advance their work and career in order to fulfill their responsibilities, this sense is the entrepreneurial spirit (Abu Bakar *et al*., 2018). Therefore, entrepreneurship is one of the main priorities of professional organizations. Talent management can motivate talented people to progress further, create a positive job interpretation, make the job meaningful, and respect and interact to achieve strategic organizational goals. The organization can also use the talent management approach to achieve advantages such as better management of uncertainties in the supply and demand of talent, reduce the difference between the required skills and ultimately reduce the risk and cost of this non-compliance (Dehghanan *et al.*, 2021). In this regard, intellectual capital is a tool for organizational innovative management (Denanyoh *et al.*, 2015). Understanding entrepreneurship is spreading as a major stream in Iran requires looking into the socio-economic history of this country and its environment (Tajpour *et al.*, 2020). Municipality of Tehran is a public non-governmental organization. Most of the revenue of the Municipality of Tehran is from the sale of density of the real estate and constructions. Since the Municipality of Tehran is self-governing and the government budgets allocated to this organization are given exclusively to the field of public transportation, the maintenance of the city must be covered by other common methods. The Municipality of Tehran, consists of 22 districts, each of which is managed by the mayor of that district. The work environment in the municipal organization, for various reasons, faces diverse changes and challenges that force them to reduce the impact of these challenges towards the employing of elite and talented people, especially in especial tasks and key positions in decision-making (Hosseini *et al.*, 2020). At present, attention to the indigenous definition of components, indicators and effective tools for identifying, developing and maintaining organizational entrepreneurial talents and promoting their levels among qualified employees has been neglected due to lack of attention and support of top managers of organizational entrepreneurship. Due to the lack of transparency and ambiguity in this category, the 22 districts of the Municipality of Tehran, like most other similar organizations in the country, still use the same management for all their employees. However, there is not much difference between talented employees and ordinary employees, and therefore there are many challenges facing the management of human capital in municipalities, as well as other organizations and companies in the field of implementing entrepreneurial talent management, which puts this organization and similar organizations in a serious crisis of shortage of talented personnel. This, in addition to the complex conditions and poor performance of the organization, has led to customer dissatisfaction and overall a significant reduction in revenue of the organization. Given that the title of the research is in the field of entrepreneurial talent management, the findings of this research are important for organizations at national and international level. Also, the purpose of this study is to present an indigenous model of entrepreneurial talent management for 22 Districts in The Municipality of Tehran. Although case studies and miscellaneous studies have been conducted in similar field, none of the previous studies have provided a model for determining and establishing entrepreneurial talent management, and this makes the use of a model for entrepreneurial talent management a vital and necessary matter.

Theoretical foundations

To survive in the current competitive environment, organizations must be able to respond quickly to environmental threats and take advantage of existing opportunities, and in other words, have an agile structure and organization (Leseure *et al*., 2019). This requires rapid and fundamental change in organizations. The internal environment of the organization should be such that employees are fully aware of the cause and process of implementation of changes in order to have sufficient motivation to perform their goals (De Cock *et al*., 2018). Therefore, due to the rapid changes in the competitive environment, organizations need to train creative and capable forces for their survival and development (Tajpour *et al*., 2020). One of the effective components in training this characteristic in human resources is paying attention to the management methods and the entrepreneurial talent of employees (Bagheri *et al*., 2019). Entrepreneurship from a managerial point of view means a change that creates a new dimension of performance, and among them are successful organizations (Khalid *et al*., 2019) that have taken the initiative and entrepreneurship and use entrepreneurship as a way to progress and surpass competitors (Tajpour *et al*., 2018). Consequently, entrepreneurial talent management, with the benefit of both components and indicators of talent management and entrepreneurship, has led to the use of new ideas and, regardless of being new (Baaken *et al*., 2018), have included value-added products and processes; In a way that directly or indirectly creates added value for the organization and by creating creativity in various fields of work, changes in the organizations happen (Chen *et al*., 2021). Entrepreneurial activities are not just about **judgment** of opportunities, but about shaping and using new ideas adopted by institutions (Ziyae *et al*.,2019). Therefore, paying attention to entrepreneurial talent management practices using a local model to improve the selection systems, retaining and promoting employees of organizations can put higher talent levels for organizations by placing distinct talents in their proper position, while gaining a competitive advantage. In fact, maintaining the quality and quantity of talent has been a constant challenge for organizations (Gallardo-Gallardo *et al*., 2020). Organizations should spend more time developing the management, entrepreneurial talent, and employees. The most important part of this section is those that allow the organization to achieve a variety of competitive advantages and thus help improve the performance of the organization (Bagheri *et al*., 2019). The importance and value of this issue is such that it has led to intense competition from organizations to achieve entrepreneurial staff as the most expensive human capital, so that effective confrontation with increasing environmental changes depends on the entrepreneurial nature of employees and attention to the organization's distinctive talents (Tajpour and Hosseini,2021). Neri and Wilkins (2019) in a research, stated that in modern organizations, the establishment of entrepreneurial thinking and its use is inevitable.

The results of the article showed that systemic intelligence and thinking and the recognition index are inversely (negatively) related to organizational entrepreneurship and among the three variables, focus is the most relevant and complexity is the least related to organizational entrepreneurship. Kotlar and Sieger (2019) showed that talent management, in addition to direct impact, also indirectly affects entrepreneurial behavior through job satisfaction and organizational commitment of employees, which has a higher rate of indirect impact than direct impact. De la Cruz *et al*., (2018) determined that strategic entrepreneurship acts as a stimulus to achieve competitive advantage in in developed and developing countries; the results encourage top executives to implement the concept of strategic entrepreneurship in the components of coordination, oversight, control, resource management, and pragmatism that, in addition to identifying and exploiting potential opportunities, pave the way for the industry to achieve greater competitive advantage. Therefore, researchers try to pay special attention to the management of entrepreneurial talent within the municipal organization in order to identify, develop and retain and engage people with high potential and retain professional employers, in order that the Municipality of Tehran can use conceptual model to appoint its needs of qualified, efficient, and effective managers from within the municipal organization. Also, the meritocracy and succession mechanism, which is one of the main concerns of urban management, should be established in the large family of the Municipality of Tehran. The current study have been carried out in Tehran in 2021.

MATERIALS AND METHODS

In terms of purpose, the present study is progressive, and mixed-method (qualitative-quantitative), and is in the category of descriptive-exploratory studies. In other words, qualitative data were first collected through interviews and a questionnaire was developed from its analysis, then, quantitative data was collected. The method of data collection in this study was field research including library search, interview and questionnaire. In the qualitative part, the interview was conducted to achieve the model, during the fuzzy Delphi analysis in two stages and an exploratory look at the topic under discussion. In-depth semi-structured interview with purposeful sampling and 5w1h technique seeks to answer questions such as: how, why, what, where, who and when. Accordingly, the interviews with 45 managers and senior experts in the 22 districts of the Municipality of Tehran reached theoretical saturation, therefore, in the continuation of further interviews, no new code was added to the previous codes. To analyze the experts' response, the fuzzy Delphi method was used in two steps and the whole number method. The sequence of questions is not the same for all participants in the qualitative section and depends on the interview process, each person's answers and the prevailing conditions at the interview site. In this regard, questions such as: What are the components of entrepreneurial talent management? Or is it possible to have a successful organization by focusing on entrepreneurial talent management? How does entrepreneurial talent management contribute to competitive advantage among employees? Were asked by the experts. The interviews continued in the form of individual sessions with an average time of 45 minutes until the theoretical saturation was reached. Then, in the quantitative part, a questionnaire was distributed among managers and experts working in the 22 districts of Municipality of Tehran to determine whether the components obtained in the qualitative part create an entrepreneurial talent management model or not. The statistical population consisted of 450 managers and experts. The statistical society is estimated to be 212 people according to the sampling clusters classified by Cochran's formula. A 57-item researcher-made questionnaire was distributed among the statistical society according to the qualitative part. The data were statistically analyzed in a quantitative section to analyze the path and test the hypotheses by Amus 22 structural equation software. The validity of the questionnaire was assessed and confirmed through content and structure validity. To measure the validity of the structure, the Structural Equation Modeling model has been used, and to measure the content validity of the instrument, the opinions of professors and experts familiar with the subject have been used. In case of agreement between different people about the validity of the test and whether the test has content validity, a questionnaire was sent to 12 experts to confirm the validity and with some modifications, the questionnaire was prepared for distribution. In the measurement model, the internal consistency of the model or the degree of

Table 1: Cronbach's Alpha, Combined Reliability and Average Variance Extracted (AVE)

Index	Cronbach's alpha	Rho-A	Composite Reliability(CR)	AVE
Perceptual skills	0.731	0.735	0.832	0.555
Decision making	0.817	0.836	0.878	0.644
Social intelligence	0.874	0.756	0.956	0.672
Leadership change	0.736	0.782	0.984	0.701
Consequentialism (performance management)	0.714	0.722	0.947	0.817
People Management	0.915	0.728	0.938	0.693
Sustainability and accountability	0.820	0.837	0.881	0.551
Adherence to ethical principles	0.816	0.884	0.878	0.646
Complexity	0.810	0.875	0.869	0.626
Formality	0,723	0.726	0.832	0.559
Focus	0.763	0.738	0.841	0.682
Entrepreneurial talent management	0.812	0.801	0.756	0.549

reliability is measured by calculating the composite reliability and Cronbach's alpha coefficient. Reliability coefficients are shown in Table 1. In the current research model, all structures have high composite reliability and are larger than the standard index of 0.7. In fact, composite reliability indicates the high internal reliability of research data. Also, a Cronbach's alpha value above 0.7 indicates acceptable reliability.

RESULTS AND DISSCUSION

In this research, in order to achieve the criteria in different dimensions, the Delphi-fuzzy method has been used. For this purpose, the questionnaire was completed by 45 experts. Experts expressed their agreement through verbal variables such as strongly agree, agree, have no opinion, disagree and strongly disagree. The survey was conducted in two stages. After calculating the definite fuzzy results of the first and the second stages, the difference between the results in these two stages was calculated, which is shown in Table 2. According to Table 1, the indicators of intelligence (speed of perception and transmission), systems thinking (analysis), macroeconomics and perceptiveness s are components of perceptual skills. Innovation, decisiveness, tolerance for ambiguity, risk-taking and rational judgment are part of the decision-making component; and networking, collectivism, social organizations, effective communication, social etiquette and writing skills are components of social intelligence; acceptability, persuasion, participation, organizational authority, and organizational transformation are part of the leadership component; planning, coordination, monitoring, control, resource management, pragmatism, project management and time management are components of consequentialism (performance management); talent management, attention to staff satisfaction and health, development of others, performance evaluation, motivation, teamwork, and superior management are the component of people management; responsibility, agility, flexibility and stability are components of sustainability and accountability; reliability, sympathy, organizational affiliation, rule of law, commitment to values and citizenship rights are components of ethical principles; number of vertical levels between the Chief Executive Officer (CEO) and staff, organizational dispersion, number of physical locations (geographical areas), average distance of scattered units from the head office are the components of complexity; existence of specialized trainings and conditions for growth and development; existence of written rules and procedures in the organization; existence of flexibility in set standards; obedience to written operating instructions and procedures are the components officials and Involvement employees in interpreting information data, direct control of top management, determining the budget of organizational units, determining how to evaluate the performance of organizational units, were identified as a component of centralization

As Table 1 shows, the degree of disagreement of the experts in the fuzzy Delphi method in the first and second stages is less than the very low threshold (0.1), so the poll stops at this stage. Due to the fact that the scores obtained in the five indicators of organizational authority (19), organizational transformation (20), teamwork (34), superior management (35), and

Table 2: Survey results indicators by experts in two stages with fuzzy Delphi method

Index number	Description of the index	Definitive fuzzy results		The difference between the first and second stages	Index number	Description of the index	Definitive fuzzy results		The difference between the first and second stages
		First stage	Second stage				First stage	Second stage	
1	Intelligence (speed of perception and transmission)	0.84	0.83	0.01	30	Attention to staff satisfaction and health	0.68	0.67	0.01
2	Systemic thinking (analysis)	0.89	0.88	0.01	31	Development of others	0.66	0.62	0.04
3	Comprehensive	0.76	0.75	0.01	32	Performance evaluation	0.66	0.62	0.16
4	perceptiveness	0.79	0.74	0.05	33	Motivation	0.61	0.59	0.02
5	Innovation	0.86	0.81	0.05	34	team work	0.79	0.63	0.16
6	Decisiveness	0.85	0.79	0.06	35	Superior management	0.85	0.41	0.17
7	Tolerance of ambiguity	0.88	0.84	0.04	36	Responsibility	0.66	0.68	0.02
8	Risk-taking	0.82	0.79	0.03	37	Agility	0.84	0.81	0.03
9	Rational judgment	0.83	0.9	0.07	38	Flexibility	0.89	0.92	0.03
10	Networking	0.84	0.77	0.07	39	Sustainability	0.71	0.72	0.01
11	Collectiveness	0.81	0.75	0.06	40	Reliability	0.66	0.64	0.02
12	Social organizations	0.85	0.88	0.03	41	Sympathy	0.68	0.69	0.01
13	Effective communication	0.58	0.56	0.02	42	Organizational affiliation	0.89	0.75	0/14
14	Social etiquette	0.78	0.7	0.08	43	Rule of law	0.69	0.76	0.07
15	Writing skills	0.77	0.8	0.03	44	Commitment to values	0.68	0.67	0.01
16	Acceptability	0.76	0.81	0.05	45	Citizenship rights	0.72	0.73	0.01
17	Persuasion	0,75	0.82	0.07	46	Number of vertical levels between the CEO and staff	0.71	0.70	0.01
18	participation	0.73	0.60	0.13	47	Organizational dispersion	0.98	0.94	0.04
19	Organizational authority	0.73	0.86	0.02	48	Number of physical locations (geographical areas)	0.88	0.86	0.02
20	Organizational transformation	0.61	0.77	0.16	49	Average distance of scattered units from the head office	0.85	0.83	0.02
21	Planning	0.36	0.0.79	0.03	50	Existence of specialized trainings and conditions for growth and development	0.91	0.90	0.01
22	Coordination	0.36	0.24	0.02	51	Existence of written rules and procedures in the organization	0.93	0.94	0.01
23	Monitoring	0.69	0.72	0.03	52	Existence of flexibility in set standards	0.85	0.86	0.01
24	Control	0.68	0.75	0.07	53	Obedience to written operating instructions and procedures	0.55	0.54	0.01
25	Resource management	0.67	0.69	0.02	54	Involve employees in interpreting information data	0.66	0.63	0.03
26	Pragmatism	0.41	0.42	0.01	55	Direct control of top management	0.64	0.62	0.02
27	Project Management	0.69	0.68	0.01	56	Determining the budget of organizational units	0.81	0.79	0.02
28	Time Management	0.55	0.54	0.01	57	Determining how to evaluate the performance of organizational units	0.86	0.85	0.01
29	Talent Management	0.66	0.65	0.01					

Table 3. The relationships between variables based on the elements of the questionnaire

Dimensions	Questions	Dimensions	Questions	Dimensions	Questions
Perceptual skills	1-4	Consequentialism (performance management)	19-22	Complexity	36-39
Decision making	5-9	People management	26-23	Formality	40-44
Social intelligence	10-15	Sustainability and accountability	27-30	Focus	45-52
Leadership change	16-18	Adherence to ethical principles	31-35	Entrepreneurial talent management	53-57

organizational affiliation (42) were not in the very low range due to the opposition of the majority of experts, they were eliminated from research indicators categories. After performing the above steps, exploratory factor analysis was performed in order to investigate and identify the main factors and reveal their specific properties and their dependence relationships.

According to Table 3, which shows the dimensions and elements of the questionnaire, research hypotheses were formed, as follows:

1) Perceptual skills, have a significant impact on the management of entrepreneurial talent, employee;

2) Decision-making, has a significant impact on the management of entrepreneurial talent, and employee.

3) Social intelligence, has a significant effect on the management of entrepreneurial talent, and employees;

4) Leadership Change, has a significant impact on the management of entrepreneurial talent employees;

5) Consequentialism (performance management), has a significant effect on the management of entrepreneurial talent employees;

6) People Management, has a significant impact on the management of entrepreneurial talent employees;

7) Sustainability and accountability, have a significant impact on the management of entrepreneurial talent employees;

8) Adherence to ethical principles, has a significant effect on the management of entrepreneurial talent, and employees;

9) Complexity, has a significant effect on the management of entrepreneurial talent, and employees;

10) Formality, has a significant effect on the management of entrepreneurial talent and employees;

11) Recognition, has a significant impact on the management, entrepreneurial talent, and employees;

12) Focusing, has a significant impact on management, and employees' entrepreneurial talents.

In this research, the structural equation model has been used due to its capabilities and high accuracy of statistical estimates of the impact of entrepreneurial talent management components in organizations. Statistical analysis was performed using Amus software. Due to the use of Amos software for analyzing the data, first the normality of the variables is done in order to use parametric and non-parametric tests. However, if the variables are non-parametric, only the use of non-parametric tests will be allowed.

Variables normality test

The test used to check the normality of the variables is the Kolmogorov-Smirnov test using SPSS software. Based on this test, there are two assumptions:

H0: The relevant variable does not have a normal distribution

H1: The relevant variable has a normal distribution

According to Table 4, the significance level of Kolmogorov-Smirnov test for research variables is more than 0.50, therefore, the assumption one is accepted or in other words the distribution of variables is normal. The results of inferential statistics show that 95% is significant at the confidence level. Bartlett's Test of Sphericity (KMO- Kaiser-Meyer-Olkin), examines the hypothesis that whether the correlation matrix is an identical matrix or not. In this case, the variables are not related to each other and as a result,

Table 4: Normalization of research variables (Kolmogorov-Smirnov test)

Variables	Normal parameters	Mean average	Kolmogorov-Smirnov test	distribution
Perceptual skills	2.65	2	0.637	Normal
Decision making	2.656	2	0.684	Normal
Social intelligence	2.656	2	0.558	Normal
Leadership change	2.656	2	0.652	Normal
Consequentialism (performance management)	2.635	2	0.690	Normal
People Management	2.599	2	0.703	Normal
Sustainability and accountability	2.531	2	0.621	Normal
Adherence to ethical principles	2.596	2	0.709	Normal
Complexity	2.635	2	0.634	Normal
Formality	2,599	2	0.877	Normal
Focus	2.638	2	0.805	Normal
Entrepreneurial talent management	2.576	2	0.663	Normal

Table 5: KMO test results

Index	**KMO**	**Results**
Perceptual skills	0.63	The statistical power and adequacy of the sample are confirmed
Decision making	0.71	The statistical power and adequacy of the sample are confirmed
Social intelligence	0.80	The statistical power and adequacy of the sample are confirmed
Leadership change	0.73	The statistical power and adequacy of the sample are confirmed
Consequentialism (performance management)	0.86	The statistical power and adequacy of the sample are confirmed
People Management	0.69	The statistical power and adequacy of the sample are confirmed
Sustainability and accountability	0.64	The statistical power and adequacy of the sample are confirmed
Adherence to ethical principles	0.87	The statistical power and adequacy of the sample are confirmed
Complexity	0.68	The statistical power and adequacy of the sample are confirmed
Formality	0.76	The statistical power and adequacy of the sample are confirmed
Focus	0.78	The statistical power and adequacy of the sample are confirmed
Entrepreneurial talent management	0.85	The statistical power and adequacy of the sample are confirmed

it is not possible to identify new factors based on the correlation between the variables. But if it is not the same, then the variables are related to each other and as a result it is possible to identify new factors based on the correlation between the variables. This test examines the relevance and appropriateness of variables to discover structure. Small values (less than 0.05) for the significance level indicate that the correlation matrix between the variables is not the same and factor analysis will be useful for the available data (Rajabipour and Hosseini, (2018).

The result of KMO test in Table 5 shows that the value of KMO for all scales is greater than 0.6 so the sample size is good enough to perform factor analysis. The general indicators of the model fit of the hypotheses are given in Table 6. The Chi-square test examines the hypothesis that the model is consistent with the correlation pattern between the observed variables (Table 6); which according to the results, its value is equal to 2.461 and considering that it has observed the allowable limit of less than 3, the results show that the model fits well in this criterion. The non-soft fit index for good models is 0.05 or less, which in this article is 0.004, therefore it indicates a suitable fit in this section. An adaptive fit index greater than 0.9 is acceptable (0.934), which is an indication of the model's suitability and indicates a suitable fit in this section. The adjusted fit and fit index evaluates the relative amounts of variances and covariance jointly through the model, respectively. This characteristic is equivalent to using the average of squares instead of the sum of squares in the face and denominator, which according to the results is equal to 0.978 and 0.864, which has observed the allowable limit.

After making sure that the fit of the research model is desirable, the hypotheses of the conceptual research model should be confirmed or rejected based on the final model and software output. This section analyzes the test of statistical assumptions to create the final conclusions from the research findings. Fig. 1 shows the path coefficients of the research model and the non-standard research structure in which the

Table 6: Results of structural equation modeling test to fit the research conceptual model

Index	Amount	Acceptable fit
Adaptive fit index greater	0.934	Greater than 90%
Fit index	0.978	Greater than 80%
Mean Square Error of Approximation	0.004	Less than 8%
chi-square statistics (x2)(CMIN)	2.461	Between 1 -5
Adjusted Goodness of Fit Index(AGFI)	0.864	Greater than 08%

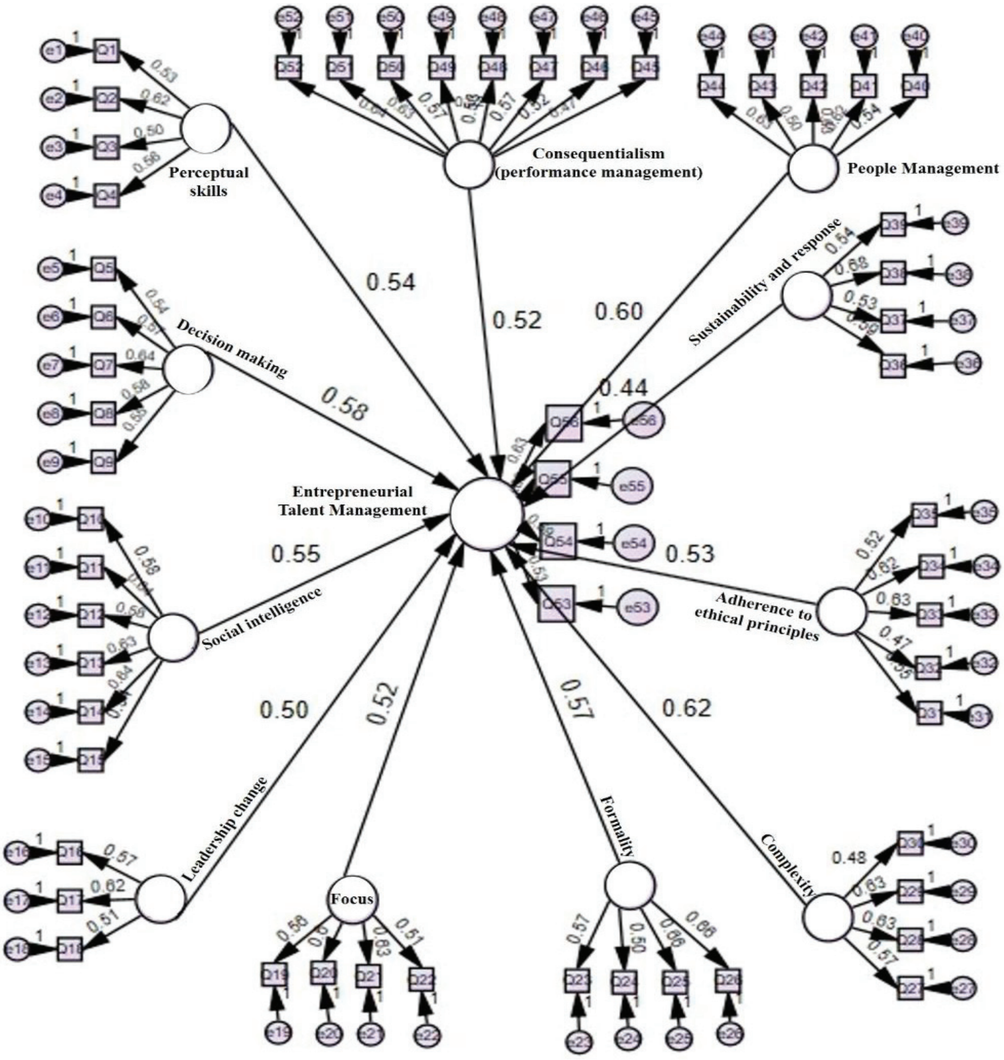

Fig. 1: Structural equations model of structural research in non-standard mode

model variables are defined in two independent and dependent parts are shown:

AS the Fig. 1 shows, the fit criteria did not meet the allowable limit, therefore the structure is known as non-standard. By screening the data, redundant data was removed and the model was performed again. As it appears in Fig. 1, the fit criteria did not meet the admissible constrain, hence the structure is known as non-standard. Thus by screening the data, repetitive information was removed and the model was implemented once more. The results shown in Fig. 2 indicate the standardization of the research structure.

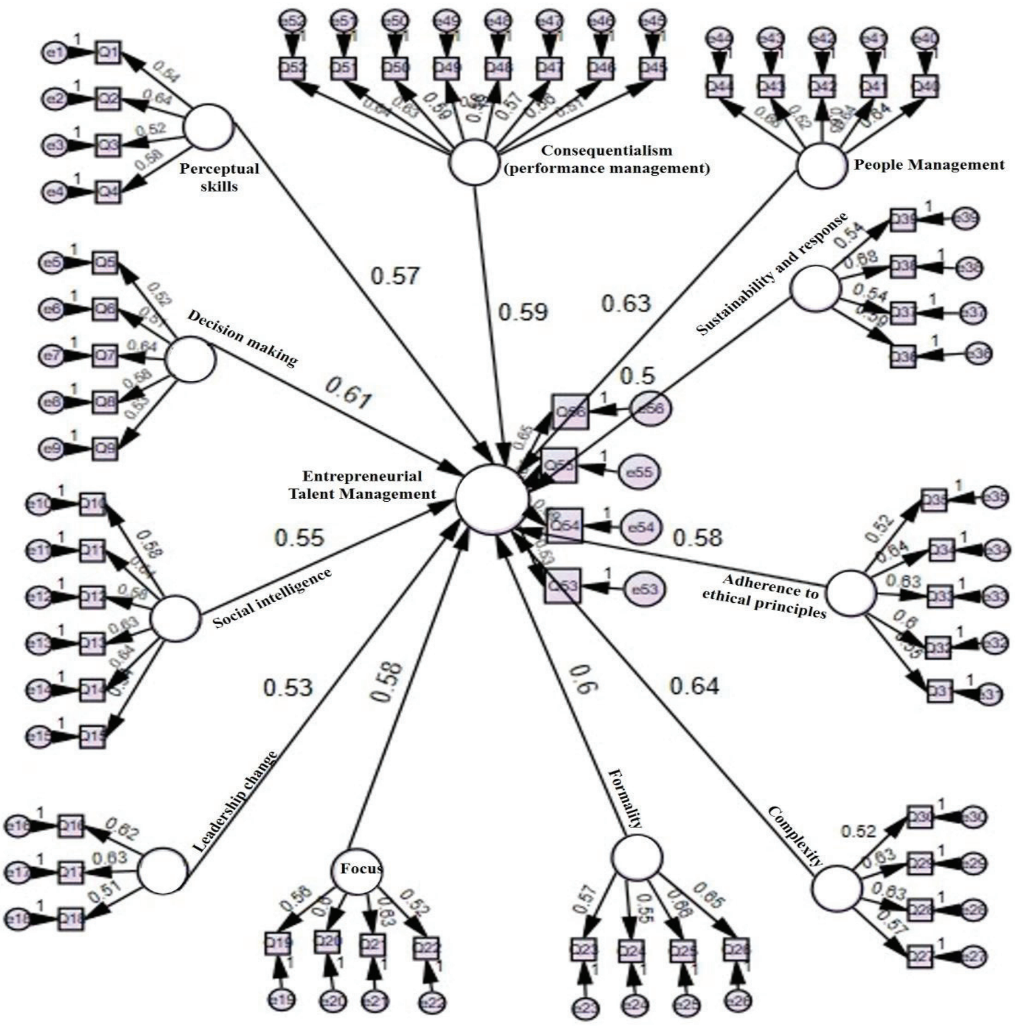

Fig. 2: Structural equation model of the research structure, in standard mode

According to the output results of Amos 22 software, the results of research hypotheses are given in Table 7:

Table 2 shows the confirmation of all hypotheses in line with the presented model, so that based on the results of the components of complexity, people management and decision making with 0.64, 0.63 and 0.61, respectively, obtained the highest factor load in the model, while sustainability and accountability with a factor load of 0.5 had the lowest effect. The first hypothesis indicates the confirmation of the effect of perceptual skills on the management of entrepreneurial aptitude of employees, in which the impact factor is equal to 0.57 and indicates the average effect and confirmation of the hypothesis in this section. Accordingly, it can be said that systems thinking leads to empowering people to deal effectively with problems and the expansion of thinking to a level that leads to desirable results, even in difficult and complex situations and such thinking leads to long-term solutions. Perceptual skills also increase individual efficiency and increase efficiency, facilitate the identification and creation of organizational opportunities, and this intensifies the individual to become an entrepreneur. In this regard, it is suggested that the speed of understanding among employees and various organizational members by holding classes education, meritocracy, organizational evaluations in relation to having systematic thoughts on developments in the municipality with respect to activities, providing

Table 7: Examination of route analysis to test the hypotheses

Hypothesis	Impact factor	t statistic	The significance level	Test result
Perceptual skills affect the management, entrepreneurial talent, and employees	0.57	10.63	0.000	Confirm
Decision making affects the management, entrepreneurial talent and employees	0.61	8.70	0.002	Confirm
Social intelligence affects the management, entrepreneurial talent, employees	0.55	9.83	0.000	Confirm
Leadership Change affects management Entrepreneurial talent Employees	0.53	10.97	0.001	Confirm
Consequentialism (performance management) affects the management, entrepreneurial talent, employees	0.59	7.84	0.025	Confirm
People management have an impact on management. Entrepreneurial talent Employees	0.63	9.95	0.001	Confirm
Sustainability and accountability has an impact on management entrepreneurial talent employees	0.50	6.79	0.01	Confirm
Adherence to ethical principles affects management, entrepreneurial talent, employees	0.58	11.52	0.03	Confirm
Complexity affects the management, entrepreneurial talent, and staff	0.64	10.67	0.000	Confirm
Recognition affects the management, entrepreneurial talent, employees	0.60	10.26	0.004	Confirm
Focus on management entrepreneurial talent Employees	0.58	8.58	0.01	Confirm

rewards to employees, needs of assessment, staff and municipal members to be considered. The results of the second hypothesis indicate the confirmation of a positive and significant decision-making effect on the management of entrepreneurial aptitude of employees in which the impact factor is 0.61 and the t statistics equal to 8.70 and the significance level is 0.002 in which this hypothesis is confirmed and the results in this section are in line with the research of Tajpour *et al.* (2020). Therefore, it can be said that decision making is a sign of growth and maturity and responsibility of individuals. Making the right decision makes a person happy and feels successful and increases his adaptation and self-confidence. This has a positive effect not only on the decision maker, but also on those involved. It is recommended to municipal managers that issues such as creativity and innovation in decision-making, risk-taking in decisions, providing new management methods in accordance with the requirements of the organization, analysis of existing conditions in the organization according to the existing strengths, weaknesses, opportunities, and threats must be considered. The results of the third hypothesis show the confirmation of a positive and significant effect of social intelligence on management entrepreneurial talent employees in which the impact factor is equal to 0.55 and shows the average impact in this sector. Also, according to the t statistics which is equal to 9.83 with the level of significance of 0.000 the confirmation of this hypothesis is proved. The results in this section are in line with research of Bagheri *et al.*, (2019). Because effective communication requires being aware of the purpose and content of the message so that the person can provide the right feedback, so, social intelligence helps a person to achieve his goals in relation to others. Social intelligence enhances people's inner perspective and allows them to have better reaction patterns. Social intelligence also teaches the individual how to play different roles to show their standards in interaction with others; therefore, it is recommended to municipal managers to pay attention to such issues as managing organizational knowledge, doing work in the form of groups, using social networks within the organization, the ease of establishing a relationship between managers and employees, and paying attention to employees' opinions about existing creations and functions. The results of the fourth hypothesis show the confirmation of the positive and significant effect of leadership change on the management of entrepreneurial talent of employees, in which the impact factor is equal to 0.53 and indicates the average impact in this section. Also, according to the t statistics which is equal to 10.97 and the level of significance is equal to 0.001 the confirmation of this hypothesis is proved. The results in this section are in line with research of Bagheri *et al*., (2019). The results show that leadership creates organizational stability change and a sense of continuity, but at the same time is ready to bring about the necessary change and innovation through the required knowledge. In this regard, municipal managers should pay attention to creating partnership between employees, creating a process-oriented process, creating change in the organization according to the opinions and suggestions and acceptance among managers and employees. The results of the fifth hypothesis indicate the confirmation of a positive and significant effect of consequentialism (performance management) on the management of entrepreneurial talent of employees, in which the impact factor is 0.59 and shows the average impact in this section, as well as according to t statistics, which is equal to 7.84 and the significance level is equal to 0.025, which indicates the confirmation of this hypothesis. The results in this section are in line with research of Hosseini *et al*., (2020) and Khalid *et al*., (2019). It can be stated that consequentialism involves setting goals and priorities that maximize the use of available resources in order to achieve sustainable results and in interaction with organizational goals and public expectations. Therefore, municipal managers should pay attention to such things as planning for the current situation of the organization, synergy between different organizational units, management of resources in relation to organizational resources, attention to goals, and proper scheduling in order to achieve goals. The results of the sixth hypothesis show the confirmation of a positive and significant effect of management of people on management entrepreneurial talent of employees in which the impact factor is 0.63, which indicates the average effect in this section and also according to the t statistics which is equal to 9.95 and the level of significance equal to 0.001, indicate the confirmation of this hypothesis. The results in this section are in line with research of Bagheri *et al*., (2019) and Tajpour *et al*., (2020). Human resources are the most important and sensitive organizational resource that can be the cause of success and failure of the organization. Managers cannot expect great results from their employees, unless they create such results and strategies in their employees through proper training and strategies. Managers are always involved in programs that directly and indirectly impact their results on human resources. Therefore, the development of entrepreneurship programs in organizations, regardless of the human factor and the human resource management system, will lead to failure. Also, human capital, in addition to directly affecting the recognition of opportunity, is also indirectly effective in identifying opportunity by affecting social capital. Therefore, human resources play an essential role in organizational entrepreneurship because it can encourage or delay organizational entrepreneurship with efficient subsystems and capable managers or vice versa. It is suggested that considering the satisfaction and health of the staff, periodic assessments of the current situation in the organization, motivation with appropriate payments to employees, individual and group incentives should be considered. The results of the seventh hypothesis show the confirmation of a positive and significant effect of sustainability and accountability on the management of entrepreneurial talent of employees, in which the impact coefficient is equal to 0.50 which indicates the average effect in this section and also according to t statistics which is equal to 6.79 and the level of significance is equal to 0.01, indicate the confirmation of this hypothesis. The results in this section are in line with research of Chen (2021). Sustainability and accountability by creating transparency will close the gap between manager and employee. Sustainability and accountability is one of the tools of controlling and monitoring power and combating abuse of power. Municipal managers are advised that things like introducing new programs such as providing amenities can require long-term effort and high costs, so launching simple and achievable social responsibility programs can be an effective strategy for the organization to increase employee commitment. Initiating and publicizing the voluntary activities of an organization that can create a sense of pride in working in a responsible organization among employees are good examples of this kind. The results of the eighth hypothesis show the confirmation of a positive and significant effect of adherence to ethical principles on the management of entrepreneurial talent of employees, in which the impact factor is 0.58, which indicates the average impact in this sector, and according to the t statistics of 11.52 and the significance level equal to 0.03, indicate the confirmation of this hypothesis. The results in this section are in line with research of Bagheri *et al*.,

(2019) and Khalid *et al*., (2019). Therefore, it can be said that managers and employees of organizations, including municipalities, in order to perform their organizational affairs, in addition to organizational and legal criteria, need a set of ethical guidelines that help them in organizational behaviors and practices to coordinate and unify procedures in line with organizational ethics. Managers also relate directly to the attitudes of employees and members of the organization. Adherence to ethical principles helps the organization move toward its goals. If the relationship is a healthy one, the organization will achieve its goals. If this relationship is based on unethical behavior, the organization will fail to achieve its goals. It is suggested that increasing the capacity to detect corruption and comply with regulations relating to adequate employee safety and creating an environment for appropriate training and support for managers should be considered. The results of the ninth hypothesis confirm the positive and significant effect of complexity on the management of entrepreneurial aptitude of employees in which the impact factor is 0.64 which indicates the average impact in this section and also according to the t statistics which is equal to 10.67 and the level of significance equal to 0.000, indicate the confirmation of this hypothesis. The results in this section are in line with research Bagheri *et al*., (2019) and Khalid *et al*., (2019). The results of the ninth hypothesis confirm the positive and significant effect of complexity on the management of entrepreneurial aptitude of employees in which the impact factor is 0.64 which indicates the average impact in this section and also according to the t statistics which is equal to 10.67 and the level of significance equal to 0.000, indicate the confirmation of this hypothesis. The results in this section are in line with research Bagheri *et al*., (2019) and Khalid *et al*., (2019). As business environments become more complex and dynamic than in the past, organizations need to move in the direction of being able to keep up with these changes. To this end, municipal managers should strive to strengthen creativity and entrepreneurship in the organization. The emergence of entrepreneurial behavior for higher performance than competitors depends on the members. In this regard, it is necessary for organizations to pay serious attention to human resources and in fact human capital as one of the key and important factors that affect the success of the company and the emergence of entrepreneurial behavior. By implementing a strategic talent management system, individuals are given the opportunity to create a more creative and entrepreneurial environment based on their inner motivation, which in turn increases entrepreneurial behavior. The existence of such behaviors improves the dimensions of people's moral behaviors and develops their self-confidence, and self-fulfillment in the workplace. In this regard, it is suggested that in order to meet the expectations of employees, the organization can use pre-shift meetings to share influential experiences or ideas related to humanitarian activities among employees and supervisors, establish customer-related units to establish relationships with clients in different levels in the city. The results of the tenth hypothesis indicate the confirmation of a positive and significant effect of recognition on the management of entrepreneurial aptitude of employees in which the impact factor is equal to 0.60 which indicates the average impact in this sector and also according to the t statistics equal to 10.26 and the level of significance equal to 0.004, which indicate the confirmation of this hypothesis. The results in this section are in line with the research Bersin *et al*., (2016). In relation to this component, it should be noted that one of the debatable solutions to reduce the gap between the current situation and the desired situation is to provide a basis for reforming municipal laws. Municipal managers must be able to apply appropriate management to the flexibility of the organization's rules by adopting appropriate policies and making organizational arrangements. It is suggested that municipal managers pay attention to issues such as the existence of specialized training by presenting international certificates, the existence of written rules and procedures in the organization and evaluation based on these indicators, creating flexible standards appropriate to the current situation in the organization and presenting operational plans. The results of the eleventh hypothesis show the confirmation of a positive and significant effect of focusing on management of entrepreneurial talent of employees in which the impact factor is equal to 0.58 which indicates the average effect in this section and also according to t statistics which is equal to 8.56 and the level of significance equal to 0.01, indicate the confirmation of this hypothesis. The results in this section are in line with research Bagheri *et al*., 2019) and Khalid *et al*., (2019). It can be concluded that when managers and experts in the municipality are given the right to choose and experience meaning, progress and competence in work, it motivates them, hopes for a career future and in fact strengthens the sense of individual mission. In addition, competencies activate the actual performance and potential of employees. In fact, competencies relate to people's knowledge, skills or abilities. These competencies are very valuable and lead to a competitive advantage for the organization and especially the municipalities. Therefore, municipal managers should pay attention to employee participation in interpreting data by presenting group and individual meetings to evaluate results, direct control of top management by creating a transparent structure among employees and managers, and determining the budget of organizational units by presenting operational budgets.

CONCLUSION

The purpose of this study was to present a conceptual model of entrepreneurial talent management. Based on this, first by reviewing the literature, research background and then interviewing experts through fuzzy Delphi method, first the factors causing the model in the form of components and indicators were identified; These factors were defined in 11 components of perceptual skills, decision making, social intelligence, leadership change, result orientation (performance management), management, perseverance and accountability, adherence to ethical principles, complexity, recognition and focus. Then indices corresponding to the components were determined in 57 indices. Then, according to the interview conducted through Delphi fuzzy method, five indicators of organizational authority, organizational transformation, teamwork, superior management and organizational affiliation were eliminated. Therefore, based on the approved indicators, a questionnaire was designed and distributed among the statistical sample, including 212 managers and experts from 22 districts of Municipality of Tehran with a history of more than 20 years working experience. The software output showed that the research hypotheses have been confirmed. The results showed that entrepreneurs with real skills in identifying opportunities and situations and creating momentum to develop these situations are the real pioneers of change in the economy and social change. Entrepreneurs recognize that success and survival in the future will require agility, initiative and creativity. Therefore, the reason for the desire to compete globally for skilled workers is that many employers around the world do not have entrepreneurial talent in the workplace. Therefore, talent management in municipalities is in line with the development of human capital and staff skills. That's why employees need to be differentiated and this is a unique principle in managing their entrepreneurial talents in municipalities. Another important factor in the system in municipalities is the perspective of employees. If this system does not feel the desire for change and does not have an entrepreneurial culture, the concept of entrepreneurial talent management will be violated and the accumulation of talent and escape of entrepreneurial staff and at the same time destroys the entrepreneurial talent management.

Suggestions

Based on the obtained results, the following suggestions are made to policy makers, managers:

- Establishing a system for measuring efficiency and effectiveness as quality control of individuals' output and determining the contribution of individuals in achieving the strategic goals of the organization in order to manage the reward system and various job opportunities for promotion upwards;
- Establishment of databases in the organization dedicated to recording information related to talented people and creating a structure to identify, attract, nurture and develop such personnel;
- Understanding the difference between talent development and the succession system by the municipality managers; because the issue of succession is the current activity of the organization, while the provision of talents provides the future growth and development of organizations.

Limitations and future research

Every research faces limitations in time and space, and this research is no exception to this rule. Since the data required for the research were collected through interviews with experts of the Municipality of Tehran, so it can be acknowledged that the analysis of this research was based on data collected from different perceptions of experts and not from objective sources that may in some cases the findings were influenced by personal beliefs. Finally, because the present study was conducted in 22 districts of the Municipality of

Tehran- Iran, therefore, it may be possible to extend it to other organizations in the country with different results that are not very reliable. Therefore, the suggestions of this research for the future are as follows:

• Conducting this research in other organizations Comparing the results obtained with the present study in order to identify weaknesses, strengths, opportunities and organizational threats;

• Considering the role of management styles in model presentation;

• Considering the field of functional innovations and market innovations in the field of organizational innovations in the proposed model;

• Use of multi-criteria decision-making techniques in ranking the factors affecting management Entrepreneurial talent;

• Providing an entrepreneurial model tailored to the needs and requirements of both the client and the organization

AUTHOR CONTRIBUTIONS

F. Moradi performed the literature review, research method, data analysis, research hypotheses and article conclusions. A. Momayez and A. Zamani Moghaddam reviewed the article and controlled the results of the research.

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CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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ABBREVIATION

AGFI	Adjusted Goodness of Fit Index
AVE	Average Variance Extracted
CEO	Chief Executive Officer
CR	Composite Reliability
KMO	Kaiser-Mayer-Olkin

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ORIGINAL RESEARCH PAPER

Identify and prioritize the factors affecting human resource performance management with emphasis on the role of Digital city

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ABSTRACT

BACKGROUND AND OBJECTIVES: Technological advances and the expansion of its application in urban communities have led to extensive changes in conceptual dimensions, strategic importance and geographical concentration of urban services. Today, cities are at the highest level of need to use new methods and technologies of service. Utilizing the numerous capabilities of technology in the field of urban management also has tremendous consequences, and its development in the form of intelligent municipal services requires the proper management of human resources. With the advent of the Fourth Revolution and the development of a new paradigm called digital human resource management, various areas of the human resource management process, including human resource performance management, need to be revised and updated based on this approach. Therefore, the purpose of this study is to identify the factors affecting human resource performance management with emphasis on the digital city and the prioritization of factors in the Municipality of Tehran.

METHODS: This research is applied in terms of purpose, descriptive-survey in terms of method. In order to extract the research background the library method and for data collection purposes the field method, and questionnaire tools were used. After applying the selection criteria 10 articles were selected for information extraction. After extracting the initial indicators using Delphi technique, 10 experts were interviewed. In order to analyze the data, confirmatory factor analysis and structural equations using partial least squares method have been used. The perspective of 11 employees of Municipality of Tehran using pairwise comparison questionnaire and their aggregation (with geometric mean) and analytic technique network process were performed and factors were prioritized with Super Decisions software.

FINDINGS: All items had a t-statistic greater than 1.96; therefore, none of the items were removed from the model and in total, all coefficients were significant at the 95% level. The relative weight of technological factor was 0.537, organizational 0.045, behavioral 0.078 and environmental 0.340 and since IR > 0.1=0.07, then there is consistency in pairwise comparisons. With the formation of a limit super matrix through software, the values of technological factors with 0.133, organizational 0.124, behavioral 0.086 and environmental 0.071, respectively, had the first to fourth priorities for human resource performance management with emphasis on the role of digital city.

CONCLUSION: According to the obtained indicators, four factors affecting the management of human resource performance including technological, organizational, behavioral, and environmental factors were obtained. Findings from network analysis among all the factors, technological factor had the most impact and organizational factor had the least impact on human resource performance management with emphasis on the role of the digital city.

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INTRODUCTION

Digital cities are expanding around the world, and so are technology and communication devices (Oliveira *et al*., 2020). No digital city can stand still (Sacasas, 2020). The Internet has begun its global business, simultaneously enabling humans to create rich information spaces for everyday life (Hacker *et al*., 2020). As long as the Internet makes global research and commerce possible, life will go on locally (Khamesi Maibodi, 2019). Digital cities, like ordinary cities, need to be structured and managed, and municipalities usually have this responsibility (Willis and Aurigi, 2017; Malekzadeh, G.H.; Sadeghi, 2017). In fact, urban development and the provision of urban services are one of the most important goals of municipalities or other responsible organizations (Kronsell and Mukhtar-Landgren, 2018; Ghazali *et al.,* 2021). Digital city is tied to services and concepts such as digital management, digital transportation (smart), digital citizen, and providing a variety of integrated urban services (Sargazi, 2019). The digital city (smart city), in the form of creating a smart network consisting of extensive networks of high-bandwidth fiber optics, provides a suitable infrastructure for providing smart services in the city, which facilitates the process of office work, reduces costs and saves money(Tajpour and Hosseini,2021). Time becomes (Mutule *et al*., 2021). The use of information and communication technologies in administrative affairs, especially in urban management, is an effective step towards the sustainable development of urban management (Benites and Simões, 2021), this can greatly improve the management and urban life and make it easier (Mohammadzadeh and Moharrami, 2015). Advances in information and communication technology and the expansion of its application in urban communities and the daily lives of citizens have led to extensive changes in the conceptual dimensions, strategic importance and geographical focus of urban services (De Guimarães *et al*., 2020). Today, cities, as the manifestation of the new form of life in the age of communication and the fourth wave (which is interpreted as the virtual movement) and due to the concentration of services and the maximum volume of social and economic interactions, are at the highest level of need to use new methods and technologies of service (Strohmeier, 2020). Utilizing the numerous capabilities of information and communication technology in the field of urban management has also led to dramatic consequences and developments (Dadashpoor and Yousefi, 2018). Development of cities in the form of smart municipal services, in interactions and transactions between citizens and urban management institutions or other organizations providing urban services, are considered as an effective and efficient solution for innovation and development of diversity, quality, speed and reliability in providing services to citizens (Mohammad Rahimi Lahroudi, 2019). Urban management systems in Tehran, like all metropolises, must move towards digital management (Ramezani Farkhad, 2014). The use of information and communication technology in the daily lives of citizens as well as in administrative activities, especially in the field of Human Resources (HR), has led to the emergence of a new paradigm called digital Human Resource Management (HRM) (Meske *et al.*, 2020). One of the influential factors of information technology in organizations is the field of HR (Luftman *et al*., 2017). Today, most organizations use information and communication technology-based systems in recruitment, training, empowering and managing employee performance (Ajami and Arab-Chadegani, 2014). Therefore, different areas of the HR management process, including Human Resource Performance Management (HRPM), need to be reviewed and updated based on the digital HRM paradigm (Papa *et al*., 2018). Because if the HRPM system is not in line with the prevailing paradigm, its effectiveness will be reduced (Lissitsa *et al*., 2017). One of the challenges that Municipality of Tehran is facing is the contradiction between the change of working methods and processes to the requirements of digital city and traditional HRM, which has led to the backwardness of performance in human resource management in Municipality of Tehran which has negative consequences such as inefficiency and ineffectiveness of HR performance management system in this organization. Therefore, the present study aims to identify the factors affecting human resource management with emphasis on the digital city in the Municipality of Tehran, and answer the basic questions of what the factors affecting human resource performance management with emphasis on the role of the digital cities are and how they are prioritized and classified.

Literature review

Human resource performance management is one of the most important aspects of organizational effectiveness and is one of the top priorities of managers (Govender and Bussin, 2020). The important challenges that organizations face are mostly in the field of performance management, because these challenges mainly affect the survival and life of organizations (Richards, 2019). All specific Human Resource (HR) operations such as recruitment, selection, targeting, feedback and service compensation are to improve the job performance of individuals and increase knowledge, skills and motivation of employees, so the result of all efforts of organizational factors in evaluating its performance can be seen (Rana, Malik, 2017). Unfortunately, the lack of an individual performance appraisal model that would be in line with the performance of the organizational unit and the organization as a whole, leads to incorrect judgments and the design of unattainable goals and unbalanced and impossible strategies (Idowu, 2017). Job selection, training and design operations in Human Resource Management (HRM) are based on the assumptions of individual performance factors and components (Katou, 2017). If these assumptions are violated, the quality of HR operations will also be affected. The performance management system of the individual and the organization helps the managers to check and control the realization of the plans and strategic goals of the organization and in order to be aware of the skills, abilities, knowledge and behavior of the employees on the one hand and the potentials, goals and capacities of the organizational unit on the other hand are establish a strategic link between the individual and the organization through their evaluation and audit (Jayakrishnan *et al*., 2018). In defining performance, the degree of achievement of one or more goals can be used as a criterion. Performance goals can be different depending on the team and organizational applications. The goals of companies in the discussion of performance are focused on the purpose, the element of time and the turning point of the goals (Lebas, 1995). These three elements of purpose, time and priority of goals show that in the organizational structure and organizational hierarchy, performance follows a causal relationship, a relationship in which a bridge is established between data and outcomes. In this model, performance does not define the goal, rather, it charts the path for the organization to continue correctly and transparently (Fitria *et al*., 2017). According to Tseng and Lee (2014), performance is necessary for organizational success at three levels: individual satisfaction (job satisfaction, achieving goals and personal judgment), group level (ethics, solidarity, effectiveness and productivity) and at the organizational level (income, efficiency and productivity, rate absence is the rate of return on investment and adjustment). Improving the functioning of individuals in the organization is done through clear goals and setting training programs (Taymouri, 2021). Performance metrics and indicators are divided into two general categories of financial and non-financial. Financial performance metrics are important for strategic decision making and external reporting, while non-financial metrics are useful for effective control process and internal reporting (Perera and Perera, 2013). Performance information is important for managers to make decisions from various aspects (Abualoush, 2018). Measuring performance and related information enables managers to make the right decisions at the right time and place, with the right quantity and quality and at the lowest cost (Kenarizadeh and Andar Vaj, 2019). In the performance management literature, six main factors for performance management are considered, as shown in Table 1, "Communication and Alignment" relate to the nature of goal setting, "Situation assessment and forecasting" are related to evaluation and goal achievement, and the final two have a psychological background and are considered at the individual Motivation and organizational levels. (Samsonowa, 2012). The mentioned issues can be the interaction of performance management and various environmental factors such as managerial capabilities, labor relations and organizational culture, human and organizational capital (Tjahjadi *et al*, 2019).

Goal setting is a prerequisite for real performance and Communication and alignment are two important goals of goal setting. Based on this definition, communication is the presentation of all goals within and all units of the organization. Objectives (goals) are designed and analyzed at the highest levels of the organization and then transferred to lower levels through the communication mechanism. Alignment assures planners that how well the goals which were reflected at the top levels of the organization have been achieved at other levels and in line with the higher goals and to what extent the organization's expectations have been met (Volk and Zerfass,

Table 1: Classification of performance goals (Samsonowa, 2012)

Goal setting		Evaluation and goal achievement		Motivation	
Communication	Alignment	Situation assessment	Forecasting	Individual	Organizational

2018). During the goal setting process, repetition and continuity of communication and alignment with receiving results and providing feedback can be one of the important features of goal setting in a cascading manner (Stouten, 2018). The two goals of communication and alignment reflect the planning element within the performance management cycle (Kalgin *et al*., 2018). Performance management has a significant impact on evaluating progress toward achieving set goals. Performance management is within an agreed framework of goals, standards and requirements (keshtegar and Shukuhy, 2015). Employee motivation affects the performance of individuals and consequently the performance of the organization (Idowu, 2017). The results of various studies in the field of psychology and other behavioral sciences clarify the effects of motivation on performance at different levels of individual, team and organizational. Therefore, it is not inappropriate to consider the motivation of individuals as one of the important elements in examining the performance of organizations (Bonsu, Kusi, 2014). The discussion of individual and organizational motivation issues is considered important because they refer to the element of "improvement" in the performance management cycle (Mello, Thabayapelo, 2021).

According to the systematic review of theoretical foundations to identify the factors affecting the performance management of digital HR, the factors affecting the performance management of digital HR in various indicators such as Information Technology (IT) infrastructure, organization size, data confidentiality and security, employee attitudes and finally, digital literacy divided employees can be categorized. The subject area of this research is HR performance management and its spatial area of research is the Municipality of Tehran. The Municipality of Tehran is a public non-governmental organization with eight deputies and the total number of 63,000 manpower in the headquarters, 22 districts, and affiliated organizations and companies. Deputy of Human Resources Development is one of the eight deputies, which has various goals, including improving human resource management information systems and smartening its processes, including HRPM. The current study have been carried out in Tehran in 2021.

MATERIALS AND METHODS

Considering that this research can be used in the Municipality of Tehran, the research is applied in terms of purpose and in terms of method, is descriptive-survey. To extract the research background, the library method was used and for data collection, the field method was used using a questionnaire. This study in terms of data collection time, is a cross-sectional study and its main purpose is to identify and rank the factors affecting the performance management of digital human resources. Preliminary studies in this study included archival data, articles published in national and international scientific journals, conferences and authored books on human resource performance management. Fig. 1 shows the screening process of articles. After four stages with applied screening of criteria, the title and abstract were reviewed and two stages of screening with content review were also performed. As a result, 10 articles were selected information extraction. In order to evaluate the quality of the content, they were graded by the Critical Appraisal Skills Program (CASP).

After extracting the initial indicators, interviews were conducted with academic experts and professionals familiar with digital concepts and human resources to confirm and complete the results. The demographic characteristics of the interviewees are shown in Table 3.

Of the 32 experts, 10 were eligible for interview. Indices with the highest frequency were selected. One of the methods used to acquire group knowledge is the Delphi technique, which is a process that has a predictive structure and helps decision-making during survey rounds, information gathering, and finally, group consensus. In order to select the experts, four characteristics were considered: knowledge and experience in the related field, willingness, sufficient

Table 2: National and international studies on research background

Research output	Title	Reference
Digital organizational culture can affect organizational performance, and in this effect, the variables of business digitalization and the development of the value of digital technologies also play a mediating role	Digital technologies and company performance: The role of digital organizational culture	Martínez-Caro *et al*. (2020)
If formal organizational and bureaucratic structures disrupt organizational communication and interaction, these barriers can be overcome through the use of communication technologies, given that the organization's HR can utilize such innovations and the vital preparing in the field	Bridging formal barriers in digital work environments–Investigating technology-enabled interactions across organizational hierarchies	Meske *et al*. (2020)
Focus on managing employee performance by replacing leader and members based on goal setting theory	Employee performance management affects individual innovation in public organizations: The role of stability and LM X	Audenaert *et al*. (2019)
Organizations or companies that work digitally need special design to instill a better attitude and motivation in their employees and clients.	Smart cities and digital workplace culture in the global European context: Amsterdam, London and Paris	Vallicelli (2018)
Digital smart cities must operate on the basis of new communication and information technologies in the dimensions of drinking water system, traffic, weather, population, public transportation, and urban parking lots	Exploiting IoT and Big Data Analytics: Defining Smart Digital City using Real-Time Urban Data	Rathore *et al*. (2018)
Digital HR literacy can solve many organizational problems	Digital work in a digital organization is challenging	Davison and Ou (2017)
Union presence negatively adversely influences the utilization of IT and a low level of e-HRM is expected	Effectiveness of performance management	Haines and St-Onge (2012)
Among the dimensions of attitude, mental norm and perceived behavior control, only attitude has a significant and positive effect on the intention and acceptance of using e-HRM	Improving the quality of municipal services by analyzing the predictors of the intention to use electronic human resource management in Yazd	Khamesi Maibodi (2019)
Understanding the usefulness and ease of using a computer has a positive and significant relationship with the experience of using IT and organizational culture has a positive and significant effect on understanding the ease of using a computer, and the role of HR has a positive and significant effect on understanding the usefulness	Identifying acceptance factors of e-HRM with structural equation approach	Khorsandi and Haj Alian (2019)
HR indices and organizational culture (and the relevant dimensions) have a positive and significant effect on employee performance	Investigating the effect of effective factors (cultural, human resources) on the performance of Ahvaz Municipality employees	Mardani *et al*. (2017)

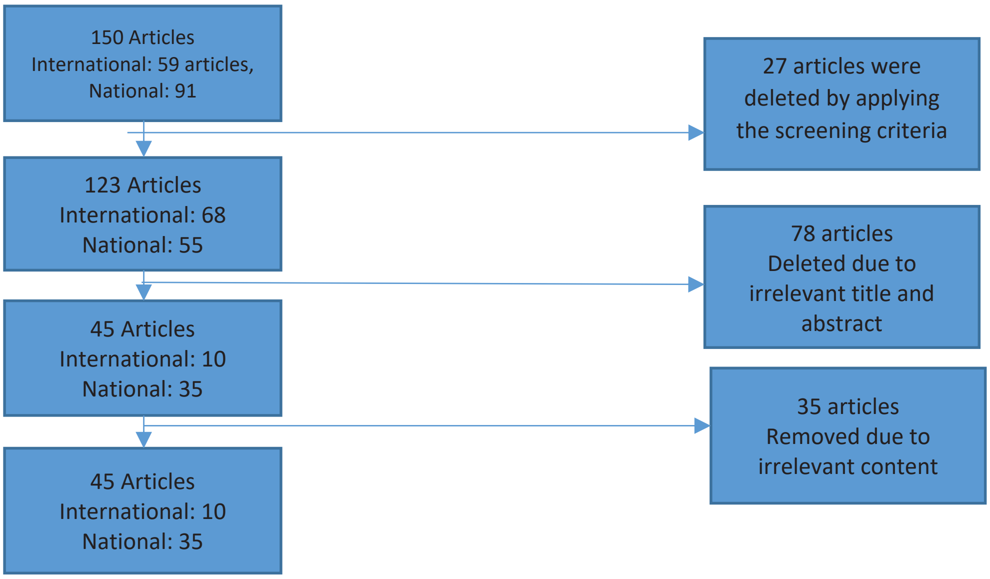

Fig. 1: The process of searching and selecting appropriate articles

Table 3: Demographic characteristics of the interviewees

Demographic characteristics	Description	Frequency
Gender	Male	6
	Female	4
Expert age distribution	25-35	3
	36-45	7
Education level	Master	4
	PhD	6
Work experience (year)	5-10	5
	More than 10	5

time to participate and effective communication skills. In addition to the identified indicators, in an open question, the indicators considered by the experts, which did not exist among the identified indicators, were also questioned. Ultimately, the final indicators, according to their sources and the expert's opinion, were extracted and categorized (Table 4) into 4 factors. Fig. 2 shows the conceptual model of the research based on the final indicators. Then, these factors were compiled in the form of a questionnaire (20 questions) and provided to all senior, middle and operational managers of the Municipality of Tehran. For sampling purposes, the relative stratification method has been used. The Municipality of Tehran is a public non-governmental organization with eight deputies, 63,000 manpower in the headquarters, 22 districts and affiliated organizations and companies. The number of managers in the organization in all areas is 800. According to Morgan's table, 260 people were selected as a sample and completed the questionnaire. The reliability of the questionnaire was calculated by Cronbach's alpha method and using SPSS software, which had an alpha coefficient above 0.7. Content analysis and expert opinion were also used to assess the validity of the tool. Finally, structural equation modeling using PLS software was used for confirmatory factor analysis of factors and indicators and also to fit the research model. The conceptual model of the research based on theoretical foundations is shown in Fig. 2.

Table 4: The study factors and indicators

Row	Factors	Code	Indicators	Row	Factors	Code	Indicators
1	Technological	TF1	Technical infrastructure	11	Behavioral	BF1	Culture
2		TF2	Informational structure	12		BF2	Experts and staff IT skills
3		TF3	Custom system content	13		BF3	Leadership
4	Organizational	OF1	Organizational demographic characteristics	14		BF4	Psychological factors
5		OF2	Organization size	15		BF5	Common perspective between human resource managers and information systems
6		OF3	Knowledge and skills	16		BF6	Support and commitment
7		OF4	Filed of activity	17		BF7	Training of human resources and management staff
8		OF5	Organizational process planning	18	Environmental	EF1	Presence of the union
9		OF6	Internal marketing system	19		EF2	Economic situation of the country
10		OF7	Funds	20		EF3	Society culture

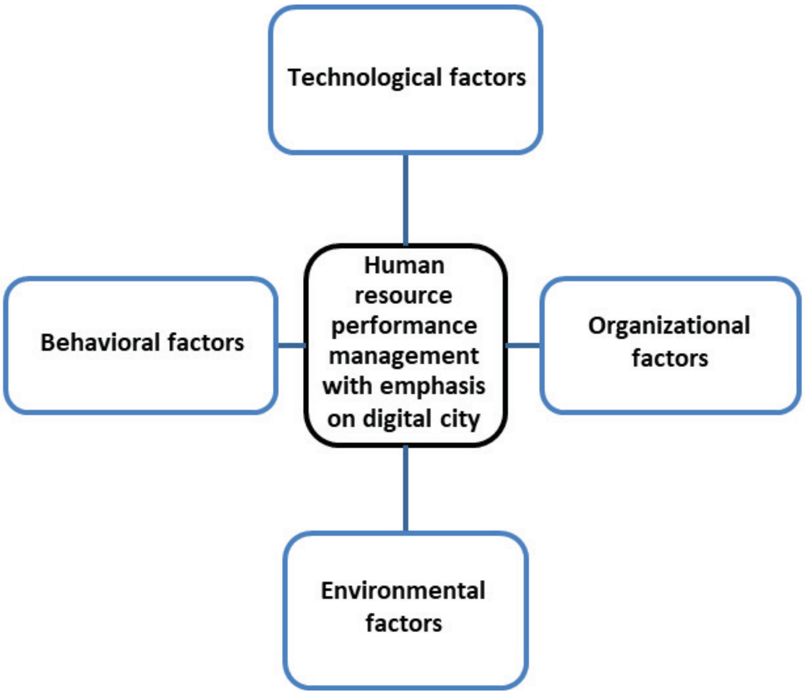

Fig. 2: Research Conceptual model

RESULTS AND DISCUSSION

According to the identified indicators and also the indicators considered by the experts, the final indicators were coded according to Table 4:

After collecting data, in order to check the accuracy of the theoretical model of the research and calculate the coefficients of impact, as well as prioritizing the factors, the method of structural equations with PLS software was used. As shown in Figs. 3 and 4, all items had a t-statistic greater than 1.96; therefore, none of the items are removed from the model. As a result, the work continues with all the items (questions) and the model is examined. The index with the highest factor load will have a greater share, and the indices with smaller coefficients will have a smaller share in measuring the relevant variable. The research questions are examined using an internal model. Hence, if the absolute value of t is greater than 1.96, at the 95% confidence level and if the value of t statistic is more than 2.58, the path coefficient at the 99% confidence level will be significant. The test results of the conceptual model of the research in the significant state of coefficients are shown in Fig. 4. Statistical values of t (significant values) are generated on the graphical path model on the arrows. These results are interpreted as t-test and at 95% confidence level must be greater than 1.96 to have a significant effect.

To prioritize the factors affecting HRPM from the perspective of 11 staff members in the Municipality of Tehran (the top elected employees of 2020 who had superior performance in the field of human resources), by pairwise comparison questionnaire and their aggregation (with geometric mean) the ANP technique was performed and the factors were prioritized with Super Decisions software. Also, the validity of the pairwise comparison questionnaire with the opinion of experts was confirmed, and since in all cases the incompatibility rate is below 0.1, so the reliability has been established. The results of the pairwise comparison of the main criteria are given in Table 5.

As it is observed in Table 5, the relative weight of the Technological factor is 0.537, Organizational 0.045, Behavioral 0.078, and Environmental 0.340. Since 0.1> IR - 0.07, then there is consistency in

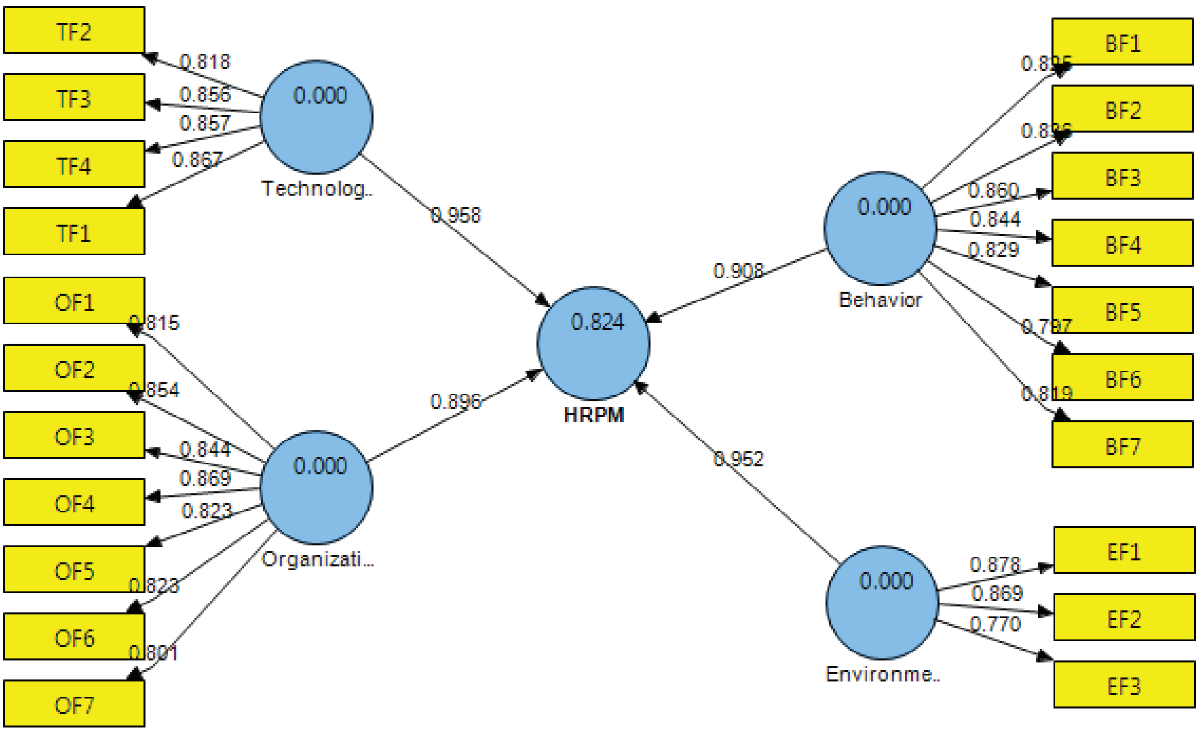

Fig. 3: The original model in the mode of path coefficients

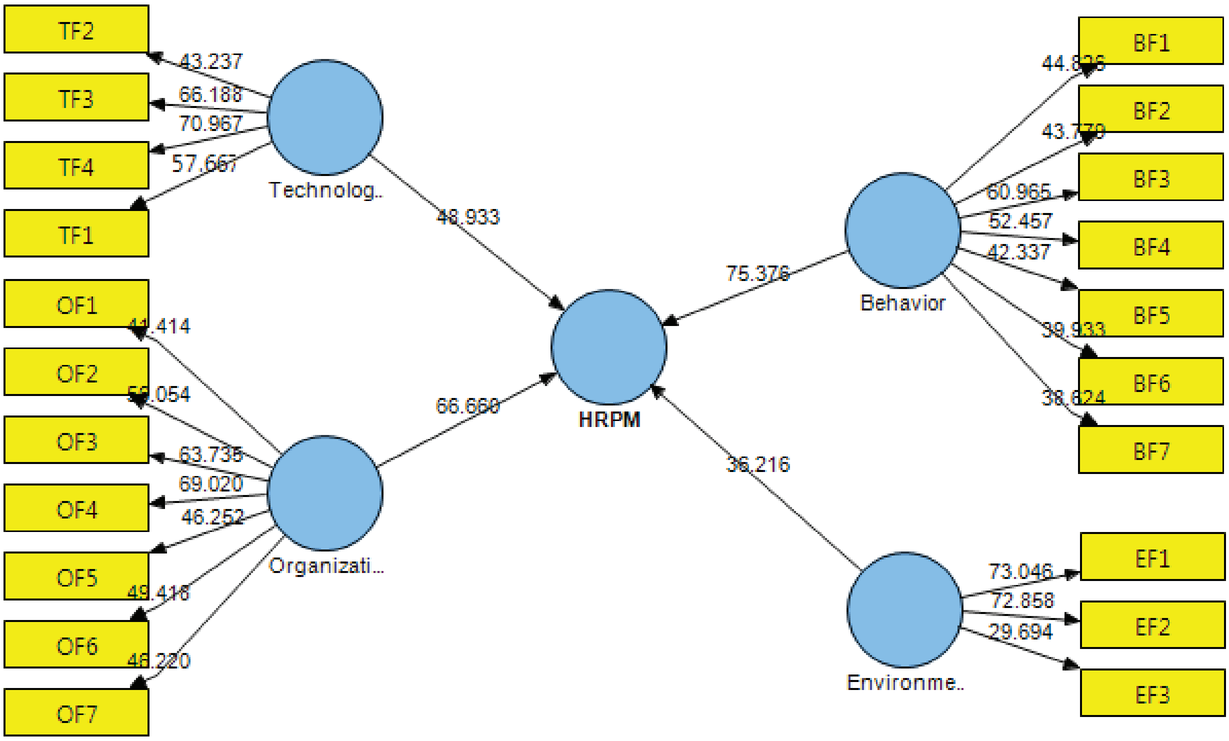

Fig. 4: The main model in the case of significant numbers (t value)

Table 5: pairwise comparison matrix of main criteria

Factor	Technological	Organizational	Behavioral	Environmental	Relative importance
Technological		9	8	2	0.537
Organizational			0.333	0.167	0.045
Behavioral				0.143	0.078
Environmental					0.0340
					IR=0.07

Table 6: Limited Super matrix Result

Factors	Technological	Organizational	Behavioral	Environmental
Objective	0.133	0.079	0,086	0,124

pairwise comparisons. After the formation of the supe rmatrix (unbalanced and rhythmic), Super Decisions software was used to obtain the limited super matrix, the result of which can be seen in Table 6.

As shown in Table 6, the factors of Technological with 0.133, Organizational with 0.124, Behavioral with 0.086 and Environmental with 0.071, respectively, will be the first to fourth priorities for human resource performance management with emphasis on the role of digital city. Therefore, according to the results of ANP, the Technological factor has the most impact and the Organizational factor has the least impact on human resource performance management with emphasis on the role of digital city. Based on the conducted studies and surveys, most of them in the field of HRPM and digital city, in spite of the fact that performance management has been the core subject, but ultimately did not identify the factors affecting performance management and ranking these factors simultaneously and the lack of this ranking is self-evident. In the first step, recognizing the factors affecting the management of human resource performance by emphasizing the requirements of the digital city has been essential in this direction. In this study, 20 effective indicators were identified using the research literature and the help of experts. Technological factors had three indicators: technical infrastructure, information structure and system content, respectively. Organizational and Behavioral factors with the highest index, including demographic characteristics of the organization, organization size, knowledge and skills, field of activity, etc., as well as Environmental factors were identified with three indicators. Finally, by designing a questionnaire, the fundamental identified elements were tested using PLS software. Prioritization of effective factors was done using the opinions of 11 expert staff and utilizing the pairwise comparison questionnaire and ANP technique. In light of the outcomes, the technological factor had the most impact and the organizational factor had the least impact on HRPM, with accentuation on the role of the digital city. The results of the current study showed that organizational culture is one of the influential sub-indices, which is consistent with the results of the research by Eva *et al*. (2020) in the digital organizational culture index. Vallicelli 2018, in their research conducted in the cities of Amsterdam, London and Paris, concluded that organizations or companies that work digitally, need a special design to inspire a better attitude and motivation to their employees and clients, yet, the current research using rankings of the indices showed that technological factors have the greatest impact. Hooy (2006) performed a study in manufacturing plants, identified the use of HRPM in small and medium enterprises (SMEs) in the production sector in the five main areas of human capital management, while the current study although examined the relevant factors, but it was performed in a very large organization of Municipality of Tehran with 64000 employees. The results of Mardani *et al*. (2017) showed that human resource factors and organizational culture (and their dimensions) have a positive and significant effect on employee performance, while in the present study, human resource factors and organizational culture are among the indicators of behavioral factors. Technological, environmental and organizational factors were also identified.

CONCLUSION

Tehran is the most developed city in Iran (capital of Iran) in terms of many social, economic, and developmental indicators, such as income per capita, level of education, medical, cultural services, employment opportunities, and investment opportunities and like any large and developing city, it has experienced significant growth in recent decades, and according to the development criteria of the world's metropolises, the citizens of Tehran want to receive faster, easier and wider urban services. According to the paradigm of a digital city, which in recent years has gradually introduced itself in the urban management of Tehran metropolis also, the change of approaches in the field of HRM towards digitalization, the importance of the organization's move to adapt its various management dimensions to the aforementioned emerging phenomena, is quite clear, and disregarding it can have negative operational consequences. One of these management dimensions that ought to be changed and updated in the current circumstance of the Municipality of Tehran is the performance management of employees in this organization. Today, smart gadgets, virtual environments, and technological innovations have become part of the existence of every single individual. Albeit these advances can pose numerous threats to human society, innovative managers and leaders can take advantage of them in their organizations. On the other hand, the pervasiveness of information technology in organizations along with the expansion of various social networks, has provided a platform for collecting large volumes of data and information about individuals. Given these facts, it can be said that creative thinking and alignment with the flow of facilities, needs and requirements of today is an issue that should be given more attention, especially in relation to human capital. The effect of paying attention to the philosophy of the organization on the flexibility and creativity of human capital and having the literacy of the optimal use of information systems are among the important methodological issues in the field of HRM.

Suggestions

According to the obtained results, the following suggestions are presented to the Municipality of Tehran:

• Organizing technology infrastructure in The Municipality of Tehran;

• Technological language standardization and system content creation;

• Updating the content of internal systems for more transparency of the managers;

• Smoothing and organizing administrative processes in order to achieve organizational goals;

• Having organizational knowledge and skills

• Having a proper organizational culture in order to promote the performance of HR appropriate to the digital city and respond to the abstract norms of the organization;

• Optimal use of the consequences and amazing results of human resource performance management with emphasis on digital city if it is accepted in the culture of society.

Research limitation

The limitations of the research include the small number of researches and international and national scientific studies related to the purpose of the research and the small number of experts related to the subject.

AUTHOR CONTRIBUTIONS

Y. Nazimi reviewed the literature, collected, analyzed, and interpreted the data. K. Teymournejad, in charge of correspondence, reviewed the results and the text editing. K. Daneshfard was responsible for reviewing the literature and interpreting the data.

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CONFLICT OF INTEREST

The authors of this article do not declare any conflict of interest with the publication of this article. Various ethical issues such as plagiarism, fabrication, data forgery, informed consent, duplication, submission and redundancy have been controlled.

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ABBREVIATIONS

Digital HR	Digital Human Resource
E- HRM	Calibri (Body)
HRM	Human Resource Management
HRPM	Human Resource Performance Management
ICT	Information and Communications Technology Ministry
IT	Information Technology
PM	Performance management

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ORIGINAL RESEARCH PAPER

Effective factors in financial empowerment of hotels in critical situations with emphasis on the conditions of Corona outbreak

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ABSTRACT

BACKGROUND AND OBJECTIVES: The study aims to use the opinions of experts to analyze the factors involved in the financial empowerment of hotels in crises with an emphasis on the prevalence of COVID 19 in five-star hotels.
METHODS: The population consists of administrative and managers and the sample size consisted of 384 members of the studied hotels. The questionnaire was sent to the sample members via social media or they answered the online questionnaire. Smart PLS software was used to analyze the raw data and the research model was designed using structural equation modeling.
FINDINGS: According to the main hypothesis, controlling coronary disease will improve the financial condition of hotels, and this hypothesis was confirmed with a coefficient of β: 0.781. As sub-hypotheses of factors of creating consistent use, consistent use change, reducing unnecessary costs, maintaining customer relationship and marketing in proportion to the coefficients of β:0.594, 0.506, 0.591, 0.623, 0.523 were confirmed as effective factors in financial empowerment. On the other hand, restricting businesses, reducing unnecessary traffic, and emphasizing social distance with coefficients of β: 0.498, 0.522, 0.618 were approved as effective factors in disease control.
CONCLUSION: Because the specific time for the end of the Coronavirus epidemic is not known; therefore, closure is not a good solution to overcome the virus in the hotel industry. Adapting the business to the new conditions can be a good way to financially empower the hotel industry. On the other hand, observing the factors discussed in disease control in the present study can cause disease control; since disease control is ultimately directly related to the hotel's financial empowerment. Finally, it should be said that the most important achievement of the present study is to present a financial crisis management approach during its occurrence.

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30	5	8

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INTRODUCTION

With the beginning of the new wave of the Coronavirus epidemic, wide restrictions have been set to control human traffic all over the world. It has increased the vulnerability of the hotel and tourism industry more than in the past. On the other hand, the tourism sector that is based on physical contact between the employees and the tourists has imposed larger damage. According to studies, the hotel industry alone has undergone a 90% loss in the first six months of the Coronavirus spread. It is a threatening statistic regarding the fixed and varying costs of hoteling (Kiganda and Omondi, 2020). The economic experts of the hotel industry predict that a large part of this economic damage to the hotel industry will be manifested in the future (Rapanna and Jumady, 2020). It should be noted that regarding the structure of hotel management, its development can lead to the provision of online pre-travel services. So, for empowerment and overcoming the current conditions, hotel management needs to make changes in its structure, because the past classic methods are not efficient in this condition anymore (Ghorbani *et al.,* 2019). The most important necessity of the hotel industry in the present condition is to identify the operational procedures that are proportional to this crisis. Due to the fixed and different costs of the hotel industry, long-term closures are not affordable (Kaushal and Srivastava, 2021) However, WHO has predicted that Coronavirus will affect all the aspects of human life including tourism for at least two years. In this condition, the managers, employees, and strategic planners of the world's chain hotels are seeking a hotel management style that is adjusted to Coronavirus. Most of the studies are focused on remote tourism, while the hotel industry has not been paid enough attention to this condition (Gao et al., 2020). In this condition, the research necessity and the literature gap raise the question of what should be done if the mechanism of this business is not adaptable to the provision of remote service. For financial empowerment and overcoming the current condition, what aspects should the hotel industry focus on to survive? This issue becomes more important when emphasized the fact is that Coronavirus has created a shock for the world's luxury hotels that used to have a favorable financial situation in the past and have been forced to modify their financial structure (Msi, 2020). In this condition, the Iranian hotel industry does not have a good situation, either. Estimations indicate the 95% damage to this industry in Iran. The Iranian economists believe that Coronavirus has mostly affected the hotel industry and the Iranian semi-active hotel industry is going through a recession because hoteling has been considered a risky sector from the beginning of this crisis (Hosseini and Valizadeh, 2021). As the tourism pole of the Middle East, Mashhad City has hosted tourists from all over the world every year. Consequently, tourism-based industries constitute one of the economic foundations of this city. Many hotels with different ranks have provided different services for tourists and employed many human forces. With the spread of Coronavirus and restriction of tourism businesses, the hotel industry of Mashhad has been significantly damaged and it has been closed for several months. So, the present research aims to identify the most important dimensions of financial empowerment of hotels regarding the current conditions. Also, it seeks to answer this question: What are the factors involved in the financial empowerment of five-star hotels of Mashhad under the current condition, Therefore, the most important novelty aspect of the present study in comparison with similar studies is the compatibility of hotel activities during the outbreak of the disease.

Theoretical foundations

To investigate the relationship between crisis and financial management in the hotel industry under the Coronavirus crisis, the exact definition of the concept of crisis should be proposed. According to the concept of crisis in management literature, in an organization such as a hotel, the crisis is an unplanned happening that requires making strategic and on-time decisions, and in the case of negligence and making inappropriate decisions, it can damage the organization (Carfagno and Parnell, 2016). According to the above definition, since a crisis is an unplanned occurrence, its management requires decision making and it can create financial shocks. Also, its control is related to the financial management and human resource departments of the organization. In other words, the financial and human management departments of an organization are responsible to plan for unplanned conditions and make proper conditions to control the shocks (Noe *et al*., 2021). In financial shocks created by sudden incidents such as coronavirus spread, the crisis can be investigated from two aspects. First, it can be studied from the employees' viewpoint who are concerned about their employment and livelihood, and second, it can be studied from the managers' viewpoint who are concerned about the future of their organization. Under financial shocks, an organization faces challenges and concerns that may be effective in all its aspects. To propose a model for financial empowerment of hotels under crises, loss, and crisis should be controlled emphasizing the coronavirus condition. So, some of these models are mentioned in the following:

Tiri and Mitraf model

Tiri and Mitraf model is one of the prognostic crisis management models in organizations. This model first defines a set of conditions as pre-crisis conditions. In the next step, it defines the crisis conditions and then, it addresses the post-crisis or learning phase. In every stage, the model suggests some solutions for the organizational managers to manage the condition (Mehr and Jahaniyan, 2016). As shown in Fig. 1, the improvement phase of the Tiri and Mitraf model has a close relationship with financial empowerment.

Reaction-proactive model

Compared to the model in Fig. 1, this model provides a more detailed classification and it suggests that organizations can move in two paths for encountering the crises. The first path is the prediction of crisis by identifying its symptoms and the second path is taking measures at the time of crisis. In other words, under reaction conditions, crisis-related decisions are made during and after the crises, and under proactive conditions, the organization's manager predicts different financial crises and the solutions to cope with them (Turner *et al*., 2017). In research, Hugman (2009), compared to the model in Fig. 1, Hagman model proposes a more realistic and practical viewpoint toward the crises. This model considers some prerequisites for effective crisis management in an organization. Hagman believes that in addition to the mentioned factors, crisis control requires practical actions and it is so important to promote the culture of countering the crises by scientific and practical methods,

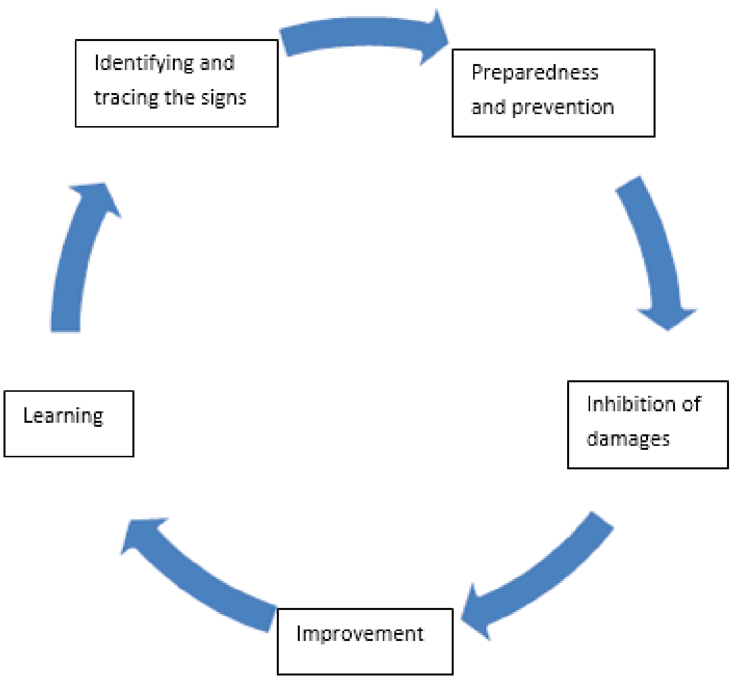

Fig 1. Tiri and Mitraf model (Mehr and Jahanyan, 2016)

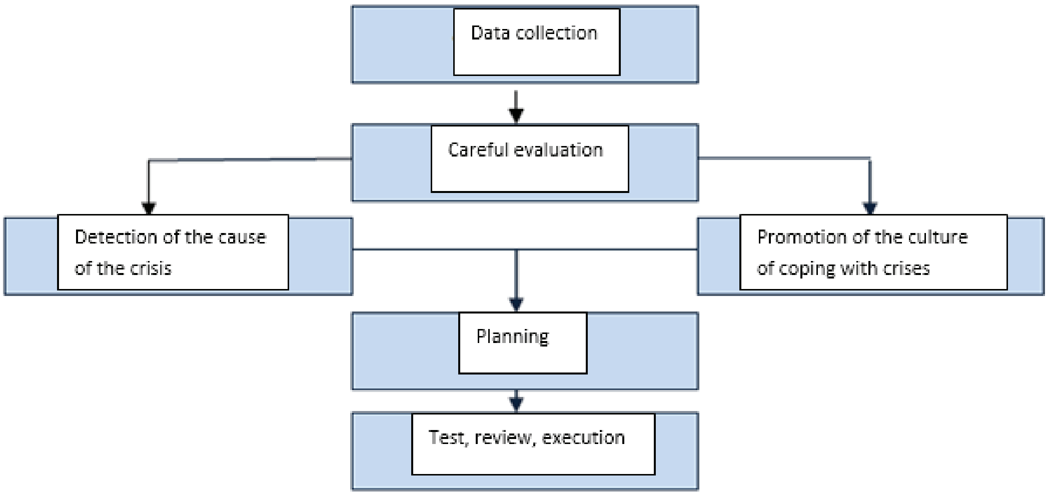

Fig 2: Hugman crisis management model (Clark, 2010)

specify crisis management teams, determine the team member roles, and plan for each stage. As shown in Fig. 2, Hagman emphasizes the financial rehabilitation of an organization that is faced a crisis.

As it is observed in Fig. 1 and 2, all these models have been developed regarding the overall conditions of all the organizations while the internal environment of every organization can be different from the other.

The most important gap in the literature is that the proposed models are based on the assumption that the crisis will end and that a specific time has been drawn for that time. However, this study aims to improve and manage the crisis at the time of its outbreak and does not wait for its end. Because the outbreak of the disease in Iran may take several years. The present study, by presenting the relevant solution and model, provides assumptions for hotels to start a limited activity during the outbreak of the disease, which can improve their financial situation.

Five-star Hotel criteria

In this section to better understand and evaluate the results, the metrics of appropriate 5-star hotels be briefly described:

A five-star hotel should have all the facilities of a four-star hotel and in addition:

The reception area should be at least two shifts and open 24 hours a day;

The reception staff must be multilingual;

Must have a parking attendant, concierge, and luggage compartment for passengers;

Must be responsible for restaurant reservations, tours, passenger transportation;

Large hall and table and chairs for a large number of guests;

Every traveler should be welcomed inside the room with flowers and gifts;

Food and drink in the hotel room or restaurant should be available 24 hours a day;

Each room must be equipped with a computer and internet;

Each hotel room must have a piece of safe and other security equipment;

The hotel room must be tidied up every evening;

Hotel catering services should be at the highest level (Ishizaka et al., 2019).

Background

Footiadis *et al*. (2020) investigated the effects of the Covid-19 pandemic on the tourism industry in China regarding the structure of the tourism industry and its subsets including the hotel industry and airlines. They performed in-depth interviews about the research subjects. They found that Coronavirus will affect the tourism industry and its subsets for a long time. So, most of the weak companies working in the business professionals will be excluded from this area. Patel *et al*. (2020) investigated the effects of the Coronavirus pandemic on the Indian tourism industry studying the tourists, the structure of the tourism industry, and its subsets. They found that Coronavirus will decrease the entrance of international tourists by 20-30% and the actors of the tourism industry that cannot adjust to these conditions will be excluded because the significant financial shock created by Coronavirus spread will be lasting. Malazizi and Birsel (2020) investigated the tourism movements in the context of global health society and they predicted the conditions of tourism and its subsets in the post-corona world. They found that in post-corona tourism and hotel industries, environmental health will become an inseparable part of the activity. In this condition, tourists should be quite informed of the health-related measures adopted proportional to the countries' conditions and environmental health experts should provide proper educations for their employees to reduce the risk of the tourists' trips and using the hotels, etc. It is an important solution to control the financial shock created by Coronavirus spread in tourism and the relevant industries such as hoteling. Keller (2020) investigated Coronavirus as an exogenous shock for international tourism (a contextual analysis) and he studied the scale of the tourism shock created by Coronavirus. They found that the virologists and epidemiologists have suggested the governments take wide measures to inhibit the pandemic and control the economic shock in the tourism sector. The governmental health measures can disturb tourism performance. So, the international tourism system will undergo a shock. Ranasinghe *et al.* (2020) investigated post-corona tourism and the effects of the Covid-19 pandemic and the solutions proposed for tourism and hotel industries in Sri Lanka to find the solutions of getting rid of the current condition. He found that many tourists have canceled their reservations in hotels and it has created a financial shock for the hotels. Wide structural changes are necessary to get rid of this situation and attract the tourists' trust again. One of these solutions is to provide disinfected rooms for the tourists. Nepal (2020) investigated traveling and tourism after Coronavirus and they analyzed this issue in terms of its opportunities and threats to tourism. They found that despite the major damages to all the tourism sectors caused by Coronavirus spread, this situation can be considered as an opportunity, too. To benefit from its opportunities, entrepreneurs should adapt to that by moving towards smart tourism that can minimize the physical contact between the tourists and the host society. Manthiou (2020) investigated the tourists' minds before and after the Corona pandemic to study the tourists' perception of luxury tourist service providers such as recreational ships and luxury hotels. They found that improvement of the tourists' perception of these sectors requires designing a model in all the areas of marketing and service provisions in different conditions from the past. Ting *et al.* (2020) investigated responsible tourism: a call to action for turbulent times. They studied the changes caused by situations such as Coronavirus, SARS, wars, etc., in tourism and its subsets. They found that to overcome the created economic crises, responsible tourism, and its dimensions provide a useful solution for getting rid of the unfavorable conditions.

The hypotheses and the conceptual model

According to the proposed model, the research hypotheses are as follows:

After the mentioned steps and extracting the dimensions related to the research subject, the conceptual model of the research was designed as Fig. 3.

Therefore, the purpose of the present study is the analysis of effective factors in the financial empowerment of hotels in critical situations with emphasis on the conditions of the Corona outbreak in Mashhad five-star hotels in 2021. The current study has been carried out in Mashhad between 2019 and 2020.

MATERIALS AND METHODS

In the first step, the library and field studies have been performed for data collection. In the second step, a list of the dimensions related to the research subject was extracted. This list was called the indicators list and it included all the net dimensions of the research subject based on the researcher's opinions. The third step i.e. the most important step is the Delphi process. In this step, the indicators are controlled over three stages to extract the final indicators. In this stage, the dimensions are directly specified by the experts. In the fourth step, the questionnaire is designed and distributed among the statistical samples. The population includes the administrative and senior (managers) of the studied hotels. Regarding the sample size, the census was used in this research.

Table 1: Research Hypotheses

Main Hypothesis: Controlling the Coronavirus spread is effective in the financial empowerment of the studied hotels.			
Sub-hypotheses	**Related to the hotel (A1)**	A11	Adaptive application is effective in the financial empowerment of the studied hotels.
		A12	Adaptive change of application is effective in the financial empowerment of the studied hotels.
		A13	Reduction of unnecessary costs is effective in the financial empowerment of the studied hotels.
		A 14	Retention of customer relationships is effective in the financial empowerment of the studied hotels.
		A15	Proper marketing (Compatible with epidemic time to regain customer trust) is effective in the financial empowerment of the studied hotels.
	Related To coronas (A2)	A 21	Restriction of businesses is effective in controlling the Coronavirus spread crisis.
		A22	Decreasing the unnecessary traffic is effective in controlling the Coronavirus spread crisis.
		A23	Emphasizing social distancing is effective in controlling the Coronavirus spread crisis.

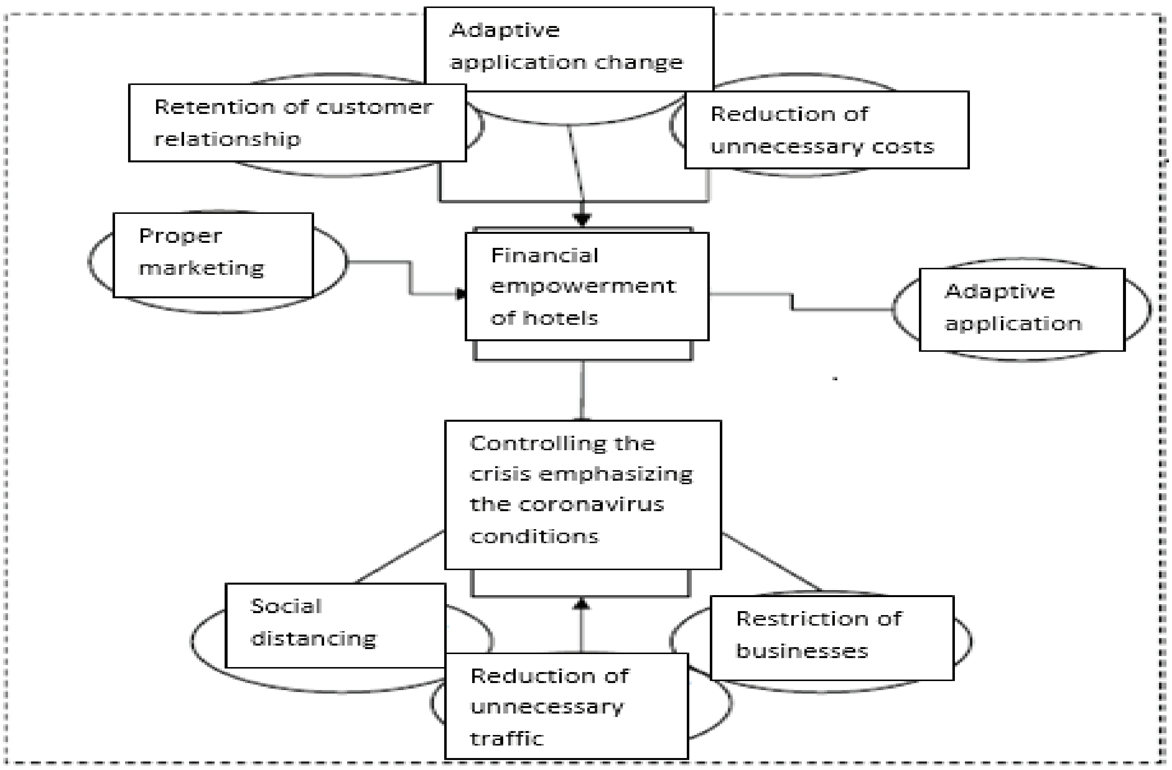

Fig. 3: The conceptual model of the research

So, a total of 397 questionnaires were distributed among the employees. It is worth mentioning that regarding the wide Coronavirus spread at the time of the research, most of the employees were not present in the research or they were excluded. So, observing the participants' health, an online researcher-made questionnaire was answered by the subjects. Data analysis was done by smart PLS. Given that data is not normally distributed PLS is the best way to celebrate data. The final research model was designed by structural equation modeling. In this process, first, the extracted indicators were included in the model and after completing that, the model was tested in terms of its goodness of fit. Table 2 indicates the data of the population and sample. Fig. 4 shows the map of the study area and its location which includes: 4a, map of Iran, 4b, map of Razavi Khorasan province, and 4b, Mashhad Metropolis area.

Fig.4 shows the location of Mashhad in Iran. Fig. 5 also shows the locations of the studied hotels

RESULTS AND DISCUSSION

Correlation of the variables

Pearson coefficient was calculated for the effect of the components of Coronavirus spread on financial empowerment of the studied hotels. The results showed a high (more than 0.5) correlation (Table 3). Data were analyzed in SPSS software to measure the correlation.

To evaluate the construct validity, Fornell and Larcker (1981) introduced the concept of Lacra share that includes the validity of each of the items, combined reliability (CR) of the constructs, and the Average Variance Extracted (AVE) (Table 4).

Factor loading

PLS modeling is done over two stages. In the first stage, the measurement (external) model is studied by validity, reliability, and confirmatory factor analysis. In the second stage, the structural (internal) model is studied by estimation of the path between the variables. The factor loadings of the variables are presented in Table 5. In the model of the present research, all the factor loading coefficients of the items are more than 0.4; i.e. there is an acceptable variance between the indicators and their related construct. The indexes in the table below are the questions provided in the questionnaire that are examined to measure structures.

Divergent validity was used to evaluate the consistency of the variables. Divergent validity is a complementary indicator for convergent validity and it indicates the differentiation of the indexes of a specific construct from the indexes of another construct in the same model. Table 6 presents the acceptable divergent validity of the model.

Fitness of the model

In the case of using structural equation modeling, one of the main components is the analysis of the fitness of the hypothesis model to the observed

Table 2: Statistical population and a statistical sample of the research

No.	Hotel	The number of employees	Sample
1	Almas 2	73	33
2	Darvishi	81	32
3	Share Talati	68	18
4	Pardisan	65	24
5	Madinatoreza	32	11
6	Homa 1 and 2	111	51
7	Ghasr	93	44
8	Park	43	24
9	Sinoor	56	31
10	Pars	72	32
11	Kosar	87	23
12	Ghasrolziyafat	54	18
13	Parsis	34	11
14	Padideh	43	19
15	Rotana	44	15
16	Hasht Bagh	41	11
Total population		1457	
Total sample		397	

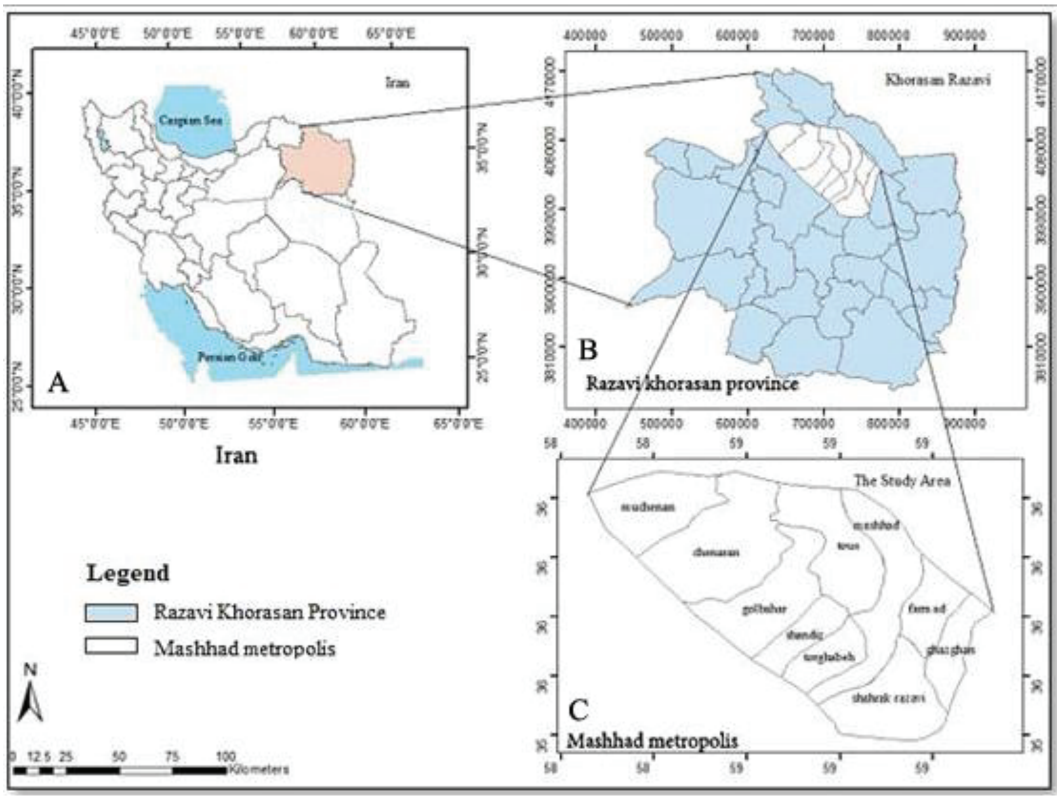

Fig. 4: location of Mashhad in Iran

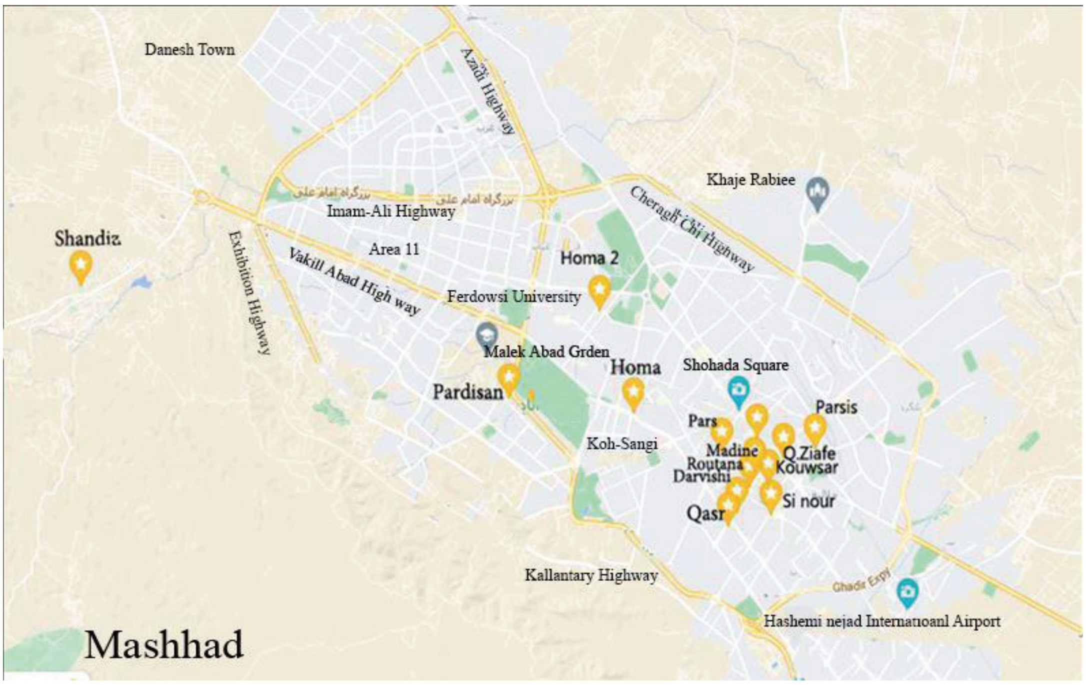

Fig. 5: Location of the studied hotels in Mashhad

Table 3: Correlation between the indicators and the constructs

	A11	A12	A13	A14	A15	A21	A22	A23	A1	A2
A11	1									
A12	0.674	1								
A13	0.346	0.795	1							
A14	0.654	0.657	0.637	1						
A15	0.376	0.605	0.510	0.598	1					
A21	0.946	0.511	0.542	0.530	0.435	1				
A22	0.352	0.463	0.342	0.557	0.432	0.301	1			
A23	0.441	0.462	0.411	0.495	0.489	0.378	0.739	1		
A1	0.776	0.672	0.599	0.601	0.608	0.447	0.253	0.546	1	
A2	0.531	0.602	0.512	0.456	0.451	0.769	0.776	0.632	0.725	1

Table 4. Combined reliability and convergent validity of the research

Variables	Items	A	CR	AVE
A11	8	0.721	0.84	0.651
A12	3	0.775	0.86	0.701
A13	4	0.767	0.80	0.502
A14	2	0.907	0.94	0.935
A15	10	0.743	0.83	0.512
A21	9	0.723	0.794	0.607
A22	5	0.737	0.828	0.719
A23	3	0.867	0.827	0.894
A1	44	0.802	0.779	0.758
A2	17	0.854	0.823	0.863
Total items	54	0.824	-	-

data. Table 7 presents the results of evaluating the fitness. This value varies from the perspective of different studies presented in the table below. The research results have good validity in comparison with the standard values provided:

Testing the research hypothesis

The two partial indexes of t and p were used to evaluate the significance of the causal relationships between the variables. Based on the significance level of 0.05, the t value should be more than 1.96. Lower values suggest that the parameter is not significant in the model. Also, the P values of less than 0.05 suggest the significant difference of the calculated value for the zero regression weights at the confidence level of 0.95. Table 8 present the results of the structural model and testing the hypotheses.

Discussion

The increased entrance of tourists can improve the financial status of the hotels and their financial flexibility. Najafi Moghadam (2017) has mentioned financial flexibility as a tool for getting rid of unfavorable financial situations and he suggests that a flexible financial structure can increase the organization's financial capability. A prospective financial structure is a wider concept than financial flexibility and it refers to the future financial status in terms of the organization's circumstances. The second hypothesis was also approved by β=0.596. This hypothesis suggests that adaptive application is effective in the financial empowerment of the studied hotels. This finding is consistent with the result reported by Li and Singal (2019) about the future financial structure of hotels and its relationship with the capital structure i.e. the debt ratio and stock financing in hoteling companies. They reported that a prospective financial strategy is widely used in the hotel industry with an emphasis on increasing different applications. As expected, the cost-revenue ratio and its significance have been promoted for the hotel managers. The development of every industry depends on the organizations' efficient

Table 5: Factor loading coefficients

Construct	Index	Factor loading	Construct	Total items	Factor loading
A11	V1	0.91	A21	Vi1	0.78
	V2	0.92		Vi2	0.79
	V3	0.86		Vi3	0.82
	V4	0.88		Vi4	0.79
	V5	0.67		Vi5	0.76
	V6	0.72	A22	Ab1	0.89
	V7	0.77		Ab2	0.88
	V8	0.64		Ab3	0.79
A12	F1	0.87		Ab4	0.82
	F2	0.86		Ab5	0.86
	F3	0.89		Ab6	0.88
A13	R1	0.82		Ab7	0.91
	R2	0.78		Ab8	0.85
	R3	0.82		Ab9	0.89
	R4	0.86	A23	Ar1	0.93
A14	D1	0.92		Ar2	0.81
	D2	0.89		Ar3	0.93
A15	A1	0.88		Ar4	0.82
	A2	0.87		Ar5	0.84
	A3	0.68		Ar6	0.87
	A4	0.87		Ar7	0.89
	A5	0.84		Ar8	0.87
	A6	0.83		Ar9	0.84

Table 6: Divergent validity

	A11	A12	A13	A14	A15	A21	A22	A23	A1	A2
A11	0.82									
A12	0.43	0.79								
A13	0.35	0.53	0.66							
A14	0.46	0.47	0.44	0.71						
A15	0.38	0.43	0.31	0.39	0.7					
A21	0.56	0.31	0.34	0.33	0.24	0.77				
A22	0.32	0.26	0.23	0.36	0.23	0.17	0.83			
A23	0.40	0.26	0.21	0.30	0.29	0.23	0.53	0.76		
A1	0.47	0.47	0.39	0.40	0.41	0.25	0.16	0.35	0.83	
A2	0.41	0.40	0.31	0.26	0.25	0.57	0.57	0.43	0.50	1

Table 7: The indexes of the fitness of the path model

Index	Value	Description
Chi-square	399.2	Full fitness at α=0.001
Tucker-Lewis	0.9	Optimal fitness
Bentler-Bonett	0.91	Optimal fitness
Holter	0.82	Optimal fitness
RMSE	0.031	Optimal fitness
GFI	0.93	Optimal fitness

Table 8: The results of testing the hypotheses

	Hypothesis	β	t	p	Result
The main hypothesis	Controlling the Coronavirus crisis is effective in the financial empowerment of the studied hotels.	0.781	5.85	<0.05	Approved
Minor hypotheses	Adaptive application is effective in the financial empowerment of the studied hotels.	0.594	3.41	<0.05	Approved
	Adaptive change of application is effective in the financial empowerment of the studied hotels.	0.506	3.12	<0.05	Approved
	Reduction of unnecessary costs is effective in the financial empowerment of the studied hotels.	0.591	3.38	<0.05	Approved
	Retention of customer relationships is effective in the financial empowerment of the studied hotels.	0.623	4.79	<0.05	Approved
	Proper marketing is effective in the financial empowerment of the studied hotels.	0.523	3.28	<0.05	Approved
	Restriction of businesses is effective in controlling the Coronavirus spread crisis.	0.498	2.85	<0.05	Approved
	Reduction of unnecessary traffic is effective in controlling the Coronavirus spread crisis.	0.522	3.17	<0.05	Approved
	Emphasis on social distancing is effective in controlling the Coronavirus spread crisis.	0.618	4.57	<0.05	Approved

performance and consequently, the employees' optimal performance. The third hypothesis was approved by β=0.506. This hypothesis suggests that adaptive change of application is effective in the financial empowerment of the studied hotels. Que *et al.* (2020) emphasize that although the hotel industry is being improved gradually, the covid-19 crisis still has a serious impact on the activity of the hotel industry. The hotel industry is expected to make fundamental changes in its performance for ensuring the employees' and tourists' health and safety and increasing the tourists' willingness to support their business. One of the requisites of working in the current situation is to adapt the employees and the financial structure of the hotel to this crisis. The fourth hypothesis suggests that reduction of unnecessary costs is effective in the financial empowerment of the studied hotels. This hypothesis was approved by β=0.591. According to the research performed by Setiadi (2019), in addition to creating new trade models of relationships with customers, employees, investors, and stakeholders, hotels use social networks to improve the efficiency of the supply chain and create trust.

CONCLUSION

The present study aimed to investigate the factors involved in the financial empowerment of hotels under the Coronavirus crisis. The research subject is derived from the financial changes of the studied hotels that are currently faced with financial problems. As the tourism pole of the Middle East, Mashhad City has an appropriate accommodation infrastructure. Although this city and its hotels used to be full of tourists throughout the year, the Coronavirus spread has created financial problems for all these hotels. The tourism industry in Mashhad has decreased in the last six months. This situation can be so damaging for a large organization such as a five-star hotel with a high fixed cost. So, it is necessary to revise the traditional financial structure and human resources of these hotels proportional to the present condition for financial empowerment. This issue is referred to as a crisis measure in the reaction-proactive model. As seen in table 7, after data analysis, all the research hypotheses were approved. According to this table and regarding the β value of the indicators, it was found that Coronavirus control is effective financial empowerment of the studied hotels. Controlling the disease in a country leads to the tourists' willingness to travel to that country. This study provides reliable structures for social network marketing and useful information for the tourists' and managers' decision-making. In tourism scenarios, modeling multifunctional tourism areas to detect the tourists' preferences and attractive tourism properties are the milestone in service provision. However, most of the previous studies have mainly focused on modeling the accommodation service of hotels.

Nevertheless, the findings of the present study suggest the multidimensional functions of hotels under the current crisis as the index of proposing a model for financial shock control in the hotel industry. According to the fifth hypothesis, retention of customer relationships is effective in the financial empowerment of the studied hotels. This hypothesis was approved by β=0.623. The hotel industry is being increasingly competitive. So, it is necessary to develop business strategies, promote performance, and update the hotel services to survive in this area. To develop proper strategies and get a competitive advantage, it is necessary to evaluate the performance of the hotel industry and especially its financial strategies. One of the main factors in this area is customer relationship management. According to the sixth hypothesis, proper marketing is effective in the financial empowerment of the studied hotels. This hypothesis was approved by β=0.523. One of the main principles of marketing in the hotel industry especially under critical conditions such as Coronavirus spread is attracting the tourists' trust. Tourists refer to hotels to meet their needs. So, reliable and high-quality services can attract the tourists' trust. Quality and reliability can attract tourists and encourage them to use the hotel services. This trust can be created in different ways such as marketing in social networks. The seventh, eighth, and ninth hypotheses suggest the three approaches of restriction of the business, reduction of unnecessary traffic, and emphasizing social distancing to control the disease. All three hypotheses were approved by the respective coefficients of 0.498. 0.522, and 0.618. It should be noted that controlling the disease is directly effective in improving the financial situation of the hotels. Researchers suggest that hotels should develop and implement internal policies to promote their performance. These policies include the promotion of their functions and strategic management accounting that is consistent with business strategies and used for modifying competitive needs. With the increasing growth of tourism in the world, the hotel industry has been also paid more attention by researchers and policymakers. In this condition, countries seek to attract more tourists and get more revenues and consequently, create prospective financial structures in this industry. Finally, it should be said that the most important achievement of the present study is to present a crisis management approach during its occurrence. Therefore, financial management researchers have increasingly paid attention to prospective financial structures that can decrease the risks and facilitate capital growth with minimum initial capital.

AUTHOR CONTRIBUTIONS

A. Faez performed the study and developed the main text. A.K. Salehi designed the study and assisted A. Faez in the fieldwork. S. Qane critically reviewed the manuscript and enriched the first draft.

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CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. The authors have also entirely witnessed the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy.

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ABBREVIATIONS

AVE	Average Variance Extracted

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CASE STUDY

Youth awareness and commitment to global warming risks among university students

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ABSTRACT

BACKGROUND AND OBJECTIVES: Global Warming is expected to induce grave effects around the world. It is predicted that many communities, mostly in the third world, experience numerous consequences because of climate change. Therefore, effective action is needed and universities play a huge role in addressing Global Warming issues and their impacts through research and innovations. Hence, assessing the extent to which African university students understand climate change and its impacts shows the extent of hope in mitigating the climate related risks. This Case study assesses how deep is the knowledge of young educated Africans on Global Warming causes and risks, how committed they are on fighting the issue and applying solutions.
METHODS: A hypothesis testing and descriptive statistics models were employed to analyze a qualified data set collected through an online interview survey among young educated Africans taken from a sample of oversea students in Chinese state universities. After a consistency study, Out of 250 questionnaires received, 224 were useful data, and Cronbach's alpha was 0.75. Participants were taken from 34 different African nationalities. All analyses were conducted using SPSS24.
FINDINGS: The results have shown that 39% of the students are very familiar with the topic, and 33% consider it as a known issue and the participants mostly rely on social media to get information about Global Warming. Two hypotheses were tested at 95% level of confidence; the critical statistic was 41.3 against a 51.2 calculated chi square for H01: Young educated Africans don't have significant knowledge on Global Warming causes. Similarly, a critical value of 36.4 was compared to a calculated chi-square of 40.6 for H02: Young educated Africans don't have significant knowledge on Global Warming risks. Hence, both hypotheses were rejected. Consequently, it was deduced that young Africans students do have general knowledge on GW risks and causes, even if some deep aspects are still unclear for some. It was revealed that most of the students (81%) are ready to take actions against climate change, and some have even started to do so; besides, they mostly believe that the solutions should come from every human being at any age or background. Using these results, recommendations were given to different stakeholders.
CONCLUSION: In Africa, where education about climate change is generally low, the findings in this study may provide all stakeholders with crucial information for better understanding of Global Warming risks and effective response plans. This study has shown that Young educated Africans report a general sense that global warming can negatively impact people's lives, but relatively few are willing to personally get involved in the response. Therefore, there is need for practical climate change health and safety education leading to improve behaviors among the most remote communities.

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INTRODUCTION

On August 22, 2019, Brazil's Amazon rainforest was burning at a record rate, the Amazon is often referred to as the planet's lungs, producing 20% of the oxygen in the Earth's atmosphere (Yeung and Alvarado, 2019); losing it would be one of the biggest catastrophes the earth will ever face. In response to the fire, the World leaders collected fought together hand to hand providing financial, scientific and operational help to Brazil. In the other side of the planet, The Lake Chad which used to be the populations source of income is now one twentieth of its previous size. This has led to extreme poverty, lack of drinkable water, basic sanitation, and high insecurity with the increase of Boko Haram's surface area. Instead, this is not seen as a major problem by World leaders, yet both problems cited above are caused by Global Warming (GW). Many conferences are being held around the world and the United Nation itself has made Climate change as one of its sustainable development goals (Arora and Mishra, 2019). As some areas of the world are less affected than others, this issue is being neglected and even unknown. The hypothesis of GW since the mid- 20th century owing to the increase of CO2 in the atmosphere is supported observationally by the spatial and seasonal characteristics of global temperatures variations (Jian-Bin *et al.*, 2012).GW is one of the most important challenges currently facing the world. The adverse impacts of GW can be catastrophic and a potential threat to the humanity existence making sure that everyone is aware of this issue and personally involved in fighting it is absolutely crucial (Afnan *et al.*, 2017). In Africa for example, with the huge poverty and demographic problems, people are less concerned with GW issues. Indeed African Governments are taking actions and local communities are much more involved than before, but the overall success of the fight against Global Warming depends also on youth awareness and engagement because young people are critical thinkers, change-makers, communicators and leaders. Besides, the information that young people receive about climate change can also benefit a much larger percentage of the population, which includes their families (Mugambiwa and Dzomonda, 2018). Causal knowledge on GW is also relevant, not only with respect to human health but also in global efforts to contain the GW phenomenon. This is because misconceptions surrounding factors responsible for GW exist which could have serious ramifications on people's health (Odonkor and Sallar, 2020). Some researchers have worked on youth awareness on GW causes and issues because before taking action against any problem, a deep understanding is necessary. In addition, educating the population on GW is the vital part of what all institutions should do in ensuring that the activities exacerbating GW are curbed and it is slowed down. Maibach *et al.* (2015), described young Americans awareness of the health effects of GW, levels of support for government funding and action on the issue, and trust in information sources; they found that 61% of attendees, before taking the survey, had given little or no thought to how GW might affect people's health. In their assessment on 733 respondents above 18 years in Pune city of Maharashtra state of India, Harshal *et al.* (2011) found that 547 (81.40%) respondents out of 733 opined that human activities are contributing to climate change. In Africa, instead, very few have worked on youth awareness on Global Warming. In their study, Gerryc and Kenneth (2020) analyzed the climatic trends and characterized the adaptation strategies in response to climatic change impacts to crop production, water resources and household economy of upland farmers in the Valley of La Trinidad, Benguet, Philippines, and these same methods could be applied in Africa, with the support of institutions. Adio-Moses and Aladejana (2015) focused on the assessment of knowledge and awareness of causes, effects and mitigating measures of GW among inhabitants of industrial areas of Ibadan southwestern Nigeria. Ugandans and Kenyans have also performed some studies on youth awareness; Oluoch *et al.* (2020) investigated the level of awareness, acceptance, and attitudes of the public towards renewable energy sources (wind, solar, geothermal and biomass) in Kenya as a case-study, whilst Lenzholzer *et al.* (2020) had an international overview with their study on the awareness levels regarding urban climate phenomena and the sense of urgency to act within four groups: citizens, local politicians, urban planners and designers, and urban climate experts. With the current situation of COVID-19, to effectively address climate change issues, it is essential to assess youth awareness regarding GW using samples that will represent different countries and backgrounds. Although there is no scientific evidence so far to show any direct link between global warming and the COVID-19 pandemic, scientists are giving opinions that these two run parallel to each other (Lone and Aijaz, 2020). To accurately measure the value of reduced carbon dioxide emissions during the global lockdown, it is recommended that scientific studies be conducted to estimate the carbon emissions generated (Oluwatosin and Olarewaju, 2021).To study the impact of COVID-19 on environment, a paper published in May 2020 found that the daily global carbon emissions during the lockdown measures in early April fell by 17% and could lead to an annual carbon emissions decline of up to 7%, which would be the biggest drop since World War II (Mantur, 2020). Naderipour *et al.* (2020) also proved that the greenhouse gases (GHG) emission, which was 8 Mt CO2 eq. from January 2020 to March 2020, reduced to 1Mt CO2 eq. for April and May. Understanding the features of climate extremes at the regional to local scale as well is a key for designing response measures that enhance preparedness and early warning systems, and additionally in the long term, it helps in the formulation of effective adaptation planning measures to reduce the related risks (Teshome and Zhang, 2019). In response, the objective of this research is to assess the extent to which African university students understand climate change and its impacts how committed they are on fighting the issue and applying solutions. To achieve this objective, some research questions have risen.

1) What is the level of awareness of Global Warming among young educated Africans? And how do they know about it?

2) How committed are Young Africans on Global warming issues?

3) What do young educated Africans think of who should bring the right solution to Global Warming?

Along with these three questions and using the literature review, two NULL hypotheses were stated and tested based on (a) contingency, (b) the extent to which participants provided information, (c) the extent to which the context offers choice and (d) the extent to which the context serves to enhance task engagement.

1) H01: Young educated Africans do not have significant knowledge on Global Warming causes.

2) H02: Young educated Africans do not have significant knowledge on Global Warming risks.

The current study has been carried out in China in October 2019.

MATERIALS AND METHODS

To answer the research questions and test the hypothesis, descriptive statistics was used with a representative set of N = 224 take from a population of the 80,000 African intentional students in China. With the belt and road initiative, China hosts thousands of international students coming from more than 150 countries, it was easier and cheaper to reach a high number of young educated Africans with different backgrounds and coming from different countries; this is why the population targeted students in China. The survey was conducted between September and October 2019. Young African students in China from 34 countries Fig. 1 were sent an e-mail requesting their help in the survey questionnaire, along with a simple, two-page format listing the questions presented with ordinal and dichotomous variables. An online questionnaire has also been established to gather all the data needed from targeted respondents. In-person interviews were conducted, with some respondents filling out and returning the survey formats. While looking for research participants, it was taken into account that some countries were more represented in china than others, but the selection of a participant in a given country was random as there was no preference on the subject and all of them had equal chances to be selected so the population and samples were both random. The selected sample size should be bigger than $n = N/1+ (N^*(e)^2)$,where e is the error and N the size of the population. We computed the probability of selection since we know the sample size (n) and the total population (N); *Probability of selection=*$(n \div N) \times 100\%$.The sampling error is computed using the formula $E=Z \times (\sigma /\sqrt{n})$,where Z is the Z score value based on the confidence interval and σ is the population standard deviation. For this study, the questionnaire was made as a result of an analysis of previous studies and authors own work. It should also be noted that all the questions are grouped into 3 main indicators that could be used for testing (awareness of causes of GW, awareness of GW risks, and commitment level on fighting the issue). The questionnaire originally written in English was translated into French, and then checked by being translated back into English to ensure conceptual consistency. The designed questionnaire consisted of 7 questions. The first question gets the basic information about the respondent, the second one is a multiple choice question that assessed the

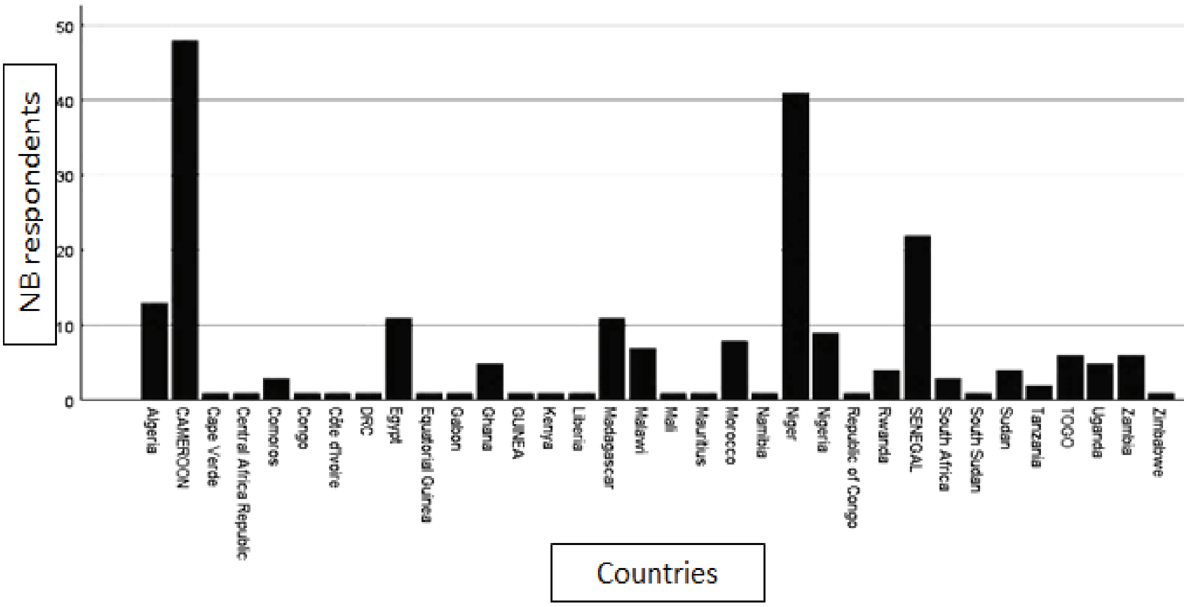

Fig. 1: The number of respondents in each country

awareness level on the words "GLOBAL WARMING" whereas the third question was getting the source of awareness. In Questions 4 and 5 respondents were asked to choose an appropriate number to indicate the level of agreement or disagreement with the following statements on GW (global warming) causes and risks respectively (Strongly agree=5, Agree=4, neither agree or disagree=3, Disagree=2, strongly Disagree=1). Question 6 was a YES/NO question to assess how the participant is committed to fight against GW, and the last question was an open question relating to the participant solution suggestion where the participants could share their thoughts. Six experts in social measurement and evaluation determined the face validity of the instrument. The average overall face validity was equal to 90%. The study used Cronbach's alpha test for reliability testing, which yield a reliability coefficient of 0.75 implying that the instrument was consistent and reliable in achieving the study objective. The data was analyzed by using statistical software SPSS 24 because the software package is easy to use, robust, affordable, and presents results with the fewest errors. For H01 and H02, the null hypothesis was tested using a chi-square goodness of fit, and a p value <0.05 was considered for the study.

RESULTS AND DISCUSSION

Participants were taken from 34 African nationalities (oversea students in 28 Chinese state universities) Fig. 1 which covers more than 60% of the African continent. Respondents were taken from Chinese universities and they were mostly from Cameroon (21.4%), Niger (18.3%), Senegal (9.8%), and Algeria (5.8%), Egypt (4.9%) and Madagascar (4.9%). These percentages were chosen accordingly with the countries proportions of international students in China. More than 95% of surveyed were between 20 and 40 years old (between 20 and 30 years (73.7%) between 30 and 40 years (24.6%), and 75% of them were men. As show on Table 1, all of the participants were well educated, mostly holding a master's degree (47.8%) and a PhD (19.2%) whereas (50.4%) of them were engineers and (22.8%) in management related field.

Table 1 shows that the selected sample = 224> 198 is representative of the population, and each selected student from the population had 2.8% chances of being selected from the population. As the sampling error (0.0392) is less than the probability of the confidence interval 5%, the sample selected can be used. For an answer to the first research question, it was found that young educated African have a very

Table 1: Sample demographics (N =224)

Representative sample : n = N/1+(N(e)^2)=80000/1+(80000*(.05)^2= 218<224*		
*Probability of sampling :(n ÷ N) x 100%.= (224/80000)*100=2.8*		
95% C.L. Sample Error: E=Z x (σ /√n)= 1.96*(0.3/√224)=0.0392<0.05		
Sex	frequency	Percentage (%)
Male	168	75
Female	56	25
Age		
Less than 20	3	1.3
Between 20 and 30 years	165	73.7
Between 30 and 40 years	55	24.6
More than 40 years	1	.4
Level of education		
BSc	69	30.8
MSc	107	47.8
PhD	43	19.2
PostDoc	5	2.2
Area of specialization		
Medicine or health science	31	13.8
Engineering	113	50.4
Management	51	22.8
Literature or Social sciences	29	12.9

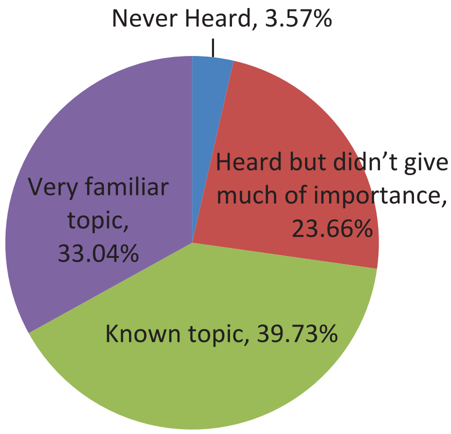

Fig. 2: Respondent's awareness level on GW

strong general awareness on the GW issue. On Fig. 2, it was recorded that (33.04%) of the respondents are very familiar with the topic, (39.73%) of them consider it as a known topic, (23%) heard of it and just (3.57%) are very unfamiliar with the topic. Respondents were allowed to choose one or more communication tools that they used to follow the GW issue. With the growth of social media in recent years, it has become an important research resource for people's ideas on specific issues. Sentiment analysis has been used to determine people's sensitivity and behavior in environmental issues (Kirelli and Arslankaya, 2020). The results revealed that 148 used social media to follow activities or advertisement, 128 of them heard about it on TV and 68 attended some events on climate change, 60 heard about it from friends and family and 93 of them used other sources of information (Fig. 3).

When asked about their opinion on the causes of GW, around half of respondents strongly opposed that GW is a Natural non-Human-related phenomenon (44%) and that Africa is one of the biggest contributors to the problem (51%).This could be clearly seen in Fig. 4. About (30%) didn't have an opinion (Fig. 4) nor had a neutral position on water pollution causing GW. Even if the displacement of human population do not actually affect the planet heating phenomenon, (32%) of the respondents had a neutral position and a cumulated of (23%) even agreed or strongly agreed on this. Approximately more than the half at least agreed on human causes of GW such as the waste burnt, industries or cars. Fig. 4. Having this result, to get a final position on GW causes, hypothesis testing was performed on the sample. To test the two hypotheses a chi-square test at 95% confidence level was used.

With 28 degrees of freedom and 95% level of confidence, the critical statistic computed is X^2 crit =41.33. The table of statistics Table 2 gives a calculated X^2 calc=51.2.As X^2 calc > X^2 crit, the

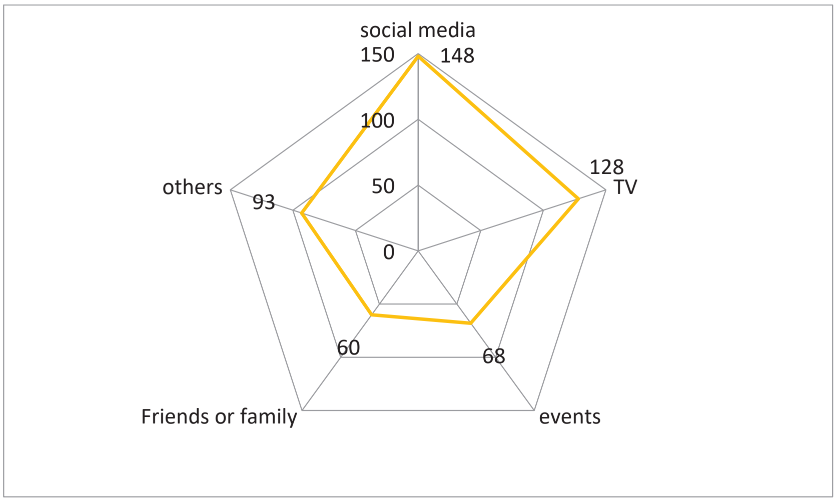

Fig. 3: Tools used by respondent's for GW information

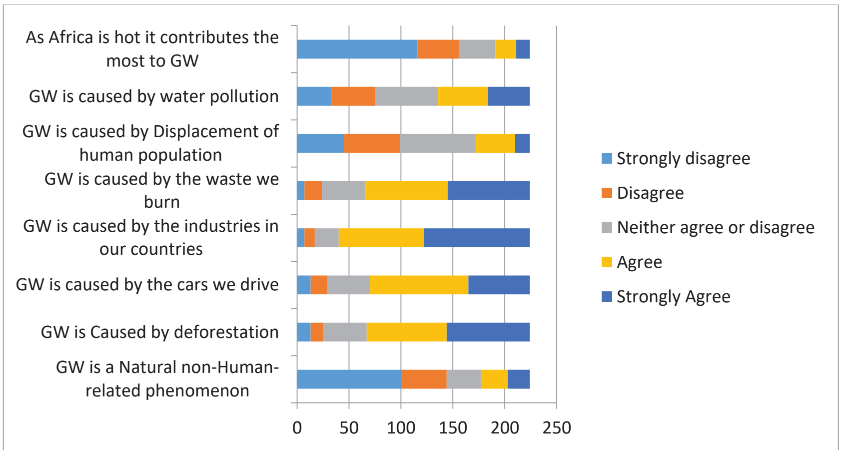

Fig. 4: Opinions on Global Warming causes

null hypothesis H01 is rejected and there is enough evidence to say that Young educated Africans do have significant knowledge on GW causes, according to the sample taken from youth studying in Chinese universities. The modal response for 3 of the questions was "strongly agree" when respondents were asked about their opinion on GW risks. Almost (60%) believe that GW can cause the extinction of some animals in African wildlife and have some serious effects on public health; nearly half (45%) agreed that the problem is as serious as HIV aids. Slightly more than half of the participants (51%) completely believe that GW can lead to poverty but, the biggest concern is that around half (49%) strongly disagreed and (19%) more disagreed that there is a given relationship between GW and terrorism and insecurity in Africa whereas it is actually true Fig. 5.

As done previously, a chi-square goodness of fit was again performed.

With 24 DF and 95% level of confidence, the critical statistic computed is X^2 crit =36.41. The table of statistics Table 3 gives a calculated X^2 calc=40.6.As X^2 calc> X^2 crit ,the null hypothesis H02 is rejected and there is enough evidence to say that Young educated Africans do have significant knowledge on GW risks according to the sample taken from youth studying in Chinese universities. The answer to the second research question is as obvious as shown in Fig.6 that respondents answered YES to most of the commitment statements. Instead,

Table 2: Descriptive statistics results on GW causes

Cause	Strongly disagree 1	Disagree2	Neither agree or disagree 3	Agree 4	Strongly Agree 5	Mean	*SD	Decision Null hyp
	Descriptive Statistics							
GW is a Natural non-Human-related phenomenon	100 44.6%	44 19.6%	33 14.7%	26 11.6%	21 9.4%	2.21	1.365	Retain
GW is Caused by deforestation	13 5.8%	12 5.4%	42 18.8%	77 34.4%	80 35.7%	3.89	1.129	Reject
GW is caused by the cars we drive	13 5.8%	16 7.1%	41 18.3%	95 42.4%	59 26.3%	3.76	1.097	Reject
GW is caused by the industries in different countries	7 3.1%	10 4.5%	23 10.3%	82 36.6%	102 45.5%	4.17	.997	Reject
GW is caused by the waste burnt	7 3.1%	17 7.6%	42 18.8%	79 35.3%	79 35.3%	3.92	1.060	Reject
GW is caused by displacement of human population	45 20.1%	54 24.1%	73 32.6%	38 17%	14 6.3%	2.65	1.161	Retain
GW is caused by water pollution	33 14.7%	42 18.8%	61 27.2%	48 21.4%	40 17.9%	3.09	1.306	Reject
As Africa is hot it contributes the most to GW	116 51.8%	40 17.9%	35 15.6%	20 8.9%	13 5.8%	1.99	1.249	Retain

*SD=standard deviation

there is approximately a 50/50 (the brown line in Fig. 6) distribution between YES and NO when the respondents were asked if they have contributed financially or willing to contribute for NGOs fighting GW. It is also noted that the choices were not mutually exclusive and the respondent could choose more than one answer.

For the third question, the participants could select more than one choice and it can be seen from Table 4 that most of them believe that the solution should come from a personal involvement in the issue, with 183 choices out of 224. Most of them (151 out of 224) think that National Governments should also contribute trough strengthening policies and taking the matter as serious. This shows how young Africans actually think that the solutions might come with everyone’s involvement and commitment, hence a widely education and information about the issue is crucial.

As the results show, an absolute majority of young educated African students taken from 34 countries acquire information about GW in the social media and television. Using these information tools, it was recorded that 33.04% of the respondents are very familiar with the topic, 39.73% of them consider it as a known topic, 23% heard of it and just 3.57% are very unfamiliar with the topic as shown in Fig. 2. A cumulated 72% frequency of respondents consider GW topic as known or familiar, thus it can be claimed that the “GLOBAL WARMING” issue is actually known by young educated Africans. Even if the 72% rate of awareness found in this study is higher than the 63% in Nigeria found by Adio-Moses and Aladejana (2015) and the 59% in china, it is still lower than the 75% in Brazil, 91% in India or the 95% in the USA, as presented by Maibach *et al.* (2015) in their research paper. There was enough evidence to reject the two Null hypotheses at 95% level of confidence, and it can be claimed that young educated Africans do have significant knowledge on GW causes and risks, according to the sample taken from youth studying in Chinese universities. This result is actually similar to the result Adio-Moses and Aladejana (2015) got in Oyo state, Danladi *et al.* (2020) found with university students in Adamawa state Nigeria, the hypothesis discussed by Mugambiwa and Dzomonda (2018) while assessing climate change and vulnerability discourse by students at a South African University

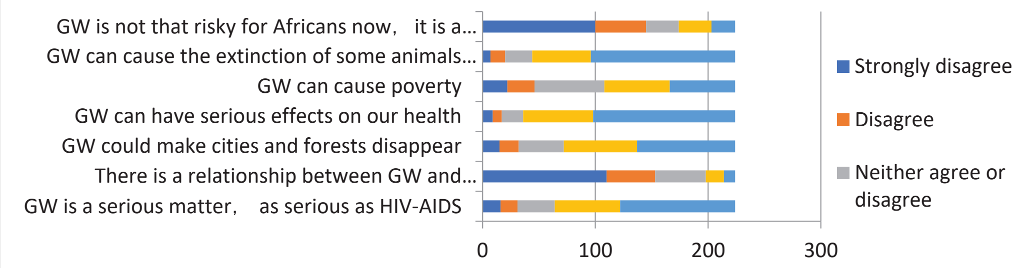

Fig. 5: Global Warming risks opinion

Table 3: Descriptive statistics results on GW risks

	Descriptive Statistics						
	Strongly disagree 1	Disagree2	Neither agree or disagree 3	Agree 4	Strongly Agree 5	Mean of agreement	*SD of agreement
GW is a serious matter as serious as HIV-AIDS	16 7.1%	15 6.7%	33 14.7%	58 25.9%	102 45.5%	3.96	1.232
There is a relationship between GW and terrorism and insecurity in Africa	110 49.1%	43 19.2%	45 20.1%	16 7.1%	10 4.5%	1.99	1.177
GW could make cities and forests disappear	15 6.7%	17 7.6%	40 17.9%	65 29%	87 38%	3.86	1.208
GW can have serious effects on public health	9 4%	8 3.6%	19 8.5%	62 27.7%	126 56.3%	4.29	1.037
GW can cause poverty	22 9.8%	24 10.7%	62 27.7%	58 25.9%	58 25.9%	3.47	1.256
GW can cause the extinction of some animals we have in Africa	7 3.1%	13 5.8%	24 10.7%	52 23.2%	128 57.1%	4.25	1.064
GW is not that risky for Africans now, it is a problem to deal with later	100 44.6%	45 20.1%	29 12.9%	29 12.9%	21 9.4%	2.22	1.377

*SD=standard deviation

and the interviews of Afnan *et al.* (2017) with biology students in the University of Bahrain. The validation of the model and advices with more calibration and improvement can be done by validating the model using additional industrial and public data sets (HongXia and Bouba, 2020). In this survey according to cumulated frequencies on Table 2, the respondents agreed that the Carbone dioxide emitted by the industries contribute the most 82.1% to GW, whereas almost 70% of the respondents rejected the fact that Africa contributes the most to climate change. According to 83% of respondents, Climate change can have serious effects on public health and 71% of them agreed that the issue as a serious matter, even as serious as HIV-AIDS. Similarly, using cumulated frequencies on Table 3, it was found that among the respondents, 66% disagreed that GW is not that risky for Africans now it is a problem to deal with later, which means that a number of them actually believe that as Africans, they are really concerned about the issue. Slightly more than half of the participants (51%) completely believe that GW can lead to poverty but, the biggest concern is that more than the half (68%) disagreed that there is a given relationship between GW and terrorism and insecurity in Africa whereas it is actually true. Although there are still many unknowns related to climate change, it is widely accepted that it greatly affects the cultivation of agricultural plants as well as the insect pests associated with them (Skendži´c *et al.*, 2021). The example of the tarnishing lake Chad Basin is a perfect one. As the lake has lost one twentieth of its original

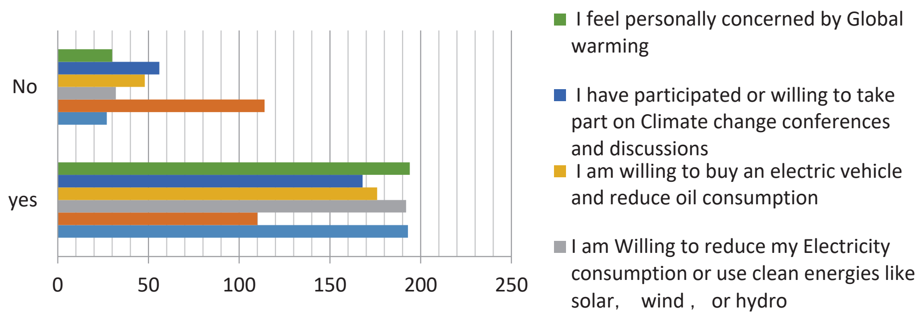

Fig. 6: Opinion on solutions to Global Warming issues

Table 4: Opinions on Global Warming Solutions (N=224)

Protagonists on GW issue	Frequency of respondents
National governments trough policies	151
International organizations controlling governments	123
NGOs through information and motivation	105
Every human being at a personal level	183

size, surrounding population is encountered with extreme poverty because they relied on fishing, agriculture and small trade around the lake, which today is nearly impossible with the space gained by the terrorist sect BOKO HARAM because of the same reasons (Yeung and Alvarado, 2019). The result on Table 5 shows that respondents feel really involved on solving the issue and are mostly committed (86%) to fight the issues through personal involvement from home. Instead, there is approximately a 50/50 distribution between YES and NO when the respondents were asked if they have contributed financially or willing to contribute for NGOs fighting GW. Here we notice that the young Africans are committed and ready to take actions, but not financially, and this might be due to the political aspects in their countries and the economies led down by corruption. This might let them think that financial support is useless. It can be also noticed that at least 85% of them have planted or willing to plant a tree and are willing to reduce their fossil energy consumption and opened to renewable energy solutions and reduce Carbone dioxide emission. Finally, participants (81%) believe that actions should be taken and 67% believe that mostly Governments at a national level should strengthen the policies on environment and bring solutions to the GW issue. To achieve this, Governments structure need actual data from surveys like as of the current research on different levels of the society, such that a good basis will be drawn to educate the people from primary school to universities, from farms to even uneducated groups, smartly use the funds allowed by International organizations, especially give the financial operation and technical needs to NGOs that go deep in the countries, actually apply the laws directly with local communities. Global Warming and attendant climate change have been controversial for at least a decade. This is largely because of its societal implications (Keller, 2003; Shcherbak *et al.,* 2022).Today, people are aware of climate change and its impacts it has on private and working life. People see the climate change as a threat and, therefore, actions must be taken to reduce the impacts of climate change (Dombrowski *et al.*, 2016). Based on the research conducted on young Africans studying in china on GW and the author's personal observation, the following remarks can be drawn. Global Warming is a known and familiar topic for young educated Africans but other studies should be conducted in other groups of the society such as primary schools, elderly people, and even non educated farmers as not everyone has access to social media and television which are found to be the most used information tool. Young educated Africans actually have general knowledge on the causes of climate change but believe that Africa does not contribute much to it. Young educated Africans have sufficient knowledge

Table 5: Willingness and involvement on GW issue

Respondents answers	I have planted or willing to plant a tree	I have contributed financially or willing to contribute for NGOs fighting GW	I am Willing to reduce my electricity consumption or use clean energies like solar， wind or hydro	I am willing to buy an electric vehicle and reduce oil consumption	I have participated or willing to take part on Climate change conferences and discussions	I feel personally concerned by Global Warming
yes	193(86%)	110(49%)	192(85%)	176(78%)	168(75%)	194(87%)
No	31(14%)	114(51%)	32(15%)	48(22%)	56(25%)	30(13%)

on Global Warming consequences though they believe that there is not a single relationship between Global Warming and the rough poverty we have in Africa. This might be due to the wrong information advertised about eternal poverty but not about GW. Thus there is a need for education in this area to attain consciousness of all parts of the society through positive and permanent changes of behaviors and active involvement. Environment education should be a lifelong education, starting from the preschool stage to all the formal and public education stages (Sah *et al.*, 2015). Young educated Africans consider GW as a serious matter, and they are actually ready to take actions to fight it, but not willing to get in financially because of the strong belief in corruption's consequences in African countries. Young educated Africans mostly agreed that the solutions should come from all the people at a personal level, but supported by Governments through education. As per recommendations, serious, well-planned, and science-based actions are needed. Participatory adaptation is very crucial regardless of gender, race, and age. There is a need to improve site-based programs execution as an adaptation strategy, raising people's awareness and sense of responsibility as an adaptation strategy (Coracero, 2021). To reduce excessive nocturnal heat loads and increase nocturnal cooling, built environment should have adequate open and green spaces, which will enhance air circulation and less radiation absorption during the day (Makokha and Shisanya, 2010). Regional climate change prediction is more relevant for assessing impact-related temperature-controlled goals. To limit GW to well below 2°C in accord with the Paris Agreement, countries throughout the world have submitted their Intended Nationally Determined Contributions (INDCs) outlining their greenhouse gas (GHG) mitigation actions in the next few decades (Wang *et al.*, 2018).In order to improve public health services and protect the health of population's immediate action is required to identify the crucial relation between environment and COVID-19 (Debraj and Dattatreya, 2020). Some questions are risen for reflection for academics but also for practitioners, as the problem is a global problem that should be faced by all the community (Niñerola *et al.*, 2018) ; the Kyoto Protocol and Paris agreements can succeed if and only if everyone in every country knows about the issue, how it is risky at a personal level and ready to take personal actions; and this can be done only by education, especially in Africa where the education rate is really low, so Innovative solutions must be brought forward to end this hazard once and forever (Shahzad , 2015).

CONCLUSION

Improving Africans awareness and commitment of Global Warming causes and impacts is imperative so that as individuals, families, communities, and as a developing continent, they become able to make efficient policies and preparedness for response plans that will protect their safety and security. Therefore this research attempts to assess African youth awareness and commitment to Global Warming risks using a university student's sample. As the results of this study revealed, almost all the young educated Africans were aware about Global Warming causes, risks and consequences. Though the students are actually aware of climate change issues, their attitude and commitment is still average and they believe solutions might come from everyone's involvement, from uneducated communities to government and NGOs. Therefore, there is need for practical climate change health and safety education with the intention of improving behaviors among the most remote communities. Environment stakeholders should also have a paradigm shift from theoretical to practical education in order to improve awareness and implication for effective dissemination. Finally, multidisciplinary research, which would advertise the response plans strategies, is also needed and collaboration with developed countries that have clear paths would be imperative for a most effective action.

AUTHOR CONTRIBUTIONS

A. Bouba Oumarou performed the literature review, questionnaire design, analyzed and interpreted the data, prepared the manuscript text, and manuscript edition. HongXia Li performed the corrections, results explanations and software tutoring.

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CONFLICT OF INTEREST

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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ABBREVIATIONS

%	Percentage
1mt eq	1 million metric tons equivalent
σ	Standard deviation
CL	Confidence Level
CO2	Carbone Dioxide
COVID-19	New coronavirus
DF	Degrees of freedom
GW	Global Warming
HIV	Human immunodeficiency virus
N	Population size
n	Sample size
NGO	Non-Governmental Organization
p-value	Probability value
X^2 calc	Calculated value of statistic in chi-square goodness of fit test
X^2 crit	Critical value of statistic in chi-square goodness of fit test
Z	Value of the statistic

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CASE STUDY

One hundred years of human resource management progress at three levels in the world

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ABSTRACT

BACKGROUND AND OBJECTIVES: Management experts believe that in order to achieve competitive advantage, Human resource management is the most important factor, because human capital according to characteristics such as: scarcity, value creation, irreplaceability and imitation, it is different from other organizational assets. Due to the importance of human resource management, this study seeks to describe the 100-year historical trend of human resource management in the world, Iran and Municipality of Tehran.
METHODS: In this research, the philosophy of interpretive research, inductive research approach, historical research strategy are selected and the method of data collection is library and field with document review tools and semi-structured interviews. The historical sources studied in this research include: theoretical literature of human resources, laws and regulations of human resources in different periods of the municipality, employment regulations, strategic documents and human resources and five-year development plans of Tehran. For this purpose, non-random and purposeful sampling was performed from the research community, which includes senior managers of human resources of Municipality of Tehran, who have been in charge since 1987. In this way, 10 people were interviewed. Data analysis was performed by qualitative content analysis.
FINDINGS: Human resource management in the world can be divided into 10 periods: before the Industrial Revolution, the Industrial Revolution, the emergence of modern companies, scientific management, social welfare movement, industrial psychology, World War I. After World War II, industrial relations divided the emergence of the field of human resource management, strategic focus on human resource management and human resource management in the era of cloud and mobile technology. The study of the historical trend of human resource management in Iran has been influenced by the employment laws of the country in 1922, 1966 and 2007 and according to it, the country is witnessing a change in human resource management from traditional (administrative and recruitment) to specialized and professional (strategic). Human resource management in Municipality of Tehran in the framework of the mission, development programs and development documents of human resources in the direction of playing administrative (recruitment, selection, promotion) and executive roles (training, development, empowerment, succession) has taken many steps and with simultaneous focus on inside and outside the organization, has moved towards urban Human resource management.
CONCLUSION: The results of the research provide important information about the historical course of Human resource management in three levels of the world, Iran and Municipality of Tehran, and by studying it, the gap between human resource management activities and measures are achieved.

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INTRODUCTION

Manpower is the main organizational capital and the organization should pay special attention to the provision, maintenance and use of this capital (Nielsen*, et al*., 2011). If the organization lacks attention in the field of Human Resource Management (HRM), it will face many problems and inefficient and unmotivated Human Resources (HRs) cannot help achieve organizational goals (Abbah, 2014). Therefore, considering the important role of the human factor, examining the role and position of HR and providing corrective solutions can help the organization to achieve its goals. HRM has undergone many changes and developments in recent years and the reason is organizational changes. Today's organizations operate in environments that face challenges such as: economic and technological change, HR availability and accessibility, HR diversity and organizational restructuring, and social and cultural change (Burke and Ng, 2006; Ernest Kossek*, et al*., 2010; Wilton, 2016). Based on these changes, HRM has also changed. In the past, this office was known as the recruitment office, and for this reason, it dealt with some archiving, filing, and controlling the entry and exit of personnel. Then the Office of Personnel Affairs was formed, which sought to investigate issues and problems and services of employees. Due to the role of HRs in achieving organizational goals, this unit became the management of HRs and was responsible for all matters of employees, including: entering the organization, employment, maintenance, until their retirement. Today, this unit is introduced as development management and human capital and the reason for this naming is the importance and strategic nature of this capital in the organization. Human capital is introduced with four characteristics, including: value creation, scarcity, imitation and competitive advantage of the organization. Due to these changes, the role and position of human resources has also changed in recent years, and administrative and executive roles in this field have decreased, and the strategic role of HRs has increased (Mathis and Jackson, 2018). The global economy is a turning point in the evolution of HRM throughout history. Even before Covid 19 enters the life cycle and business world, changes in the nature of work and employees were a common topic of discussion. Major trends such as revival nationalism, technological disruption, and demographic change and diversity have had significant implications for HRM. Today, a wide range of challenges, including asymmetry and wealth disorders, technology disruptions, aging, polarization, and declining trust in institutions, have affected the legitimacy of the world order. To these can be added the environmental crisis, climate change, and widespread shareholder concerns for companies and their goals (Harney and Cooling, 2021). Municipalities are areas of government institutions that are closer to the people (Montalvo, 2009). Recent developments in the field of municipalities have focused on their human resources and the skills and capabilities they need to achieve organizational goals (Bruns, 2014). In order to achieve the goals of such complex organizations, human resources must be managed efficiently and effectively. Effective HRM and development can help improve the performance of municipalities and provide quality services. The study of human capital has a special place in the municipal organization, which is a government service institution and seeks to implement urban development programs and has changed from a service institution to a social institution today (Burch, S., 2010). During the studies, the absence of historical and comparative study in the field of human resource management has forced the researcher to seek an answer to the following question:

What are the roles and activities of the municipality's HRs management in the last one hundred years?

Theoretical background of research

According to the historical approach of this research, the historical theoretical foundations of HRM should also be examined.

The first period: the period before the industrial revolution

•Slavery (humans were like objects to be traded) - (1100 years ago)

One of the first approaches in the field of manpower was the period of slavery (Ahmadinejad *et al.,* 2016). During this period, manpower in society was divided into three categories:

• Those that worked for themselves and marketed their product

• Slave owners

•slaves

The first group provided their manpower through their spouses and children, so having a large number of children among them was very valuable and they preferred their children to be boys so that they could use them as a useful person in physical work such as agriculture, gardening, animal husbandry, fishing and so on.

The second group, the slave owners, treated their slaves according to the moral principles they believed in, but in general slaves were those who had no rules such as working hours, job descriptions, working conditions and rules. There was no order in their operation and in all cases they were subject to their owner. The owners referred them to them at any time and at any time.

The third group, the slaves, as much as they had food to eat for a basic life, was sufficient for the owner, and the owners did not pay any attention to their hours, working conditions, rewards and benefits, education, etc. (Ahmadinejad *et al.,* 2016).

• Feudal system or Master-peasant (peasant belonged to the land and the land belonged to the master) - (from the 5th century AD)

Feudalism or the master-peasant system was a socio-economic system that covered Russia and Eastern Europe from the ninth to the second half of the nineteenth century (Ahmadinejad *et al.,* 2016). In this system, political power was divided among large landowners and each lord had a population of peasants (Zeinali and Gholizadeh, 2015). This system was created as a result of the collapse of the slavery society. Despite the variety of ways to achieve this system, it has existed in almost all lands of the world, but in each region with its own characteristics.

The characteristics of the feudal system include the following (Rashidi, 2011):

1. Peasant dependence on land: The feudal mode of production was based on landlord ownership, and farmers' personal dependence on feudal lord. The farmer's personal dependence on the master meant that in this mode of production, the peasant was no longer a slave, the control of his life was no longer in the hands of the owner, and it was not sold separately. But by selling the property or farm, it was transferred to the new owner. The farmer was not allowed to leave his master's land, nor was he allowed to freely serve another master.

2. Property uses and their types: Since the farmers did not own the land, they had to work on the land that belonged to the feudal lord, and thus the owner could use the fruits of their labor as property ownership. Thus, the feudal mode of production is based on the types of proprietary or masterful use that is received from the farmers. Ownership was in fact the surplus product of the serf, which was given to the master. Generally, there are three types of property exploitation that coexisted more or less at different stages of the feudal system. The first is the use of work and forced labor, the second is the use of products and the third is the use of cash. It should be noted that in each of the various stages of the evolution of feudal society, one of these forms has been prioritized. In the early stages of the feudal system, the use of labor, commonly referred to as "forced labor," was the predominant form of exploitation of farmers. Farmers worked certain days of the week directly for the master and on his land, and this was a forced and free work for the master. Another form of proprietary use was "product interest," which consisted of the regular delivery of a crop and livestock to the owner of the land, and finally the third type of proprietary use involved cash use, in which payment was made in cash. The predominance of cash interest in various forms of property use is related to the late feudal era. Of course, it should be noted that in addition to regular property use, the owner also imposed taxes and duties on farmers.

3. Natural economy: Another feature of the feudal mode of production is the naturalness or closure of its economy. Natural economy means a closed and limited circle of production aimed at domestic and personal consumption. That is, production is done for consumption rather than for exchange or sales purposes. In other words, natural economy means that each master lived on his property from the profits he made from the exploitation of the peasants, and almost all of his and his crew's basic necessities were produced on the owner's personal property. Exchanges outside this closed environment were rarely needed. The agricultural economy was based on the same, and the farmer's family often engaged in handicrafts, providing most of their needs within the family. Over the centuries, and with the development of

cities, the production of crafts and the division of labor and exchanges between urban and rural areas expanded, and the doors of the natural economy opened to the outside world and the market expanded.

4. Religion: Religion and religious institutions played a major role in feudal society. Religious institutions, places of worship, and religious ministers had extensive endowments and extensive property, and interacted with the feudal state and feudal aristocracy in terms of wealth and influence. Religious ideology is the dominant form of ideology in the feudal mode of production. In the classical form of the feudal system, religion served feudalism, presenting it as eternal, destined, and sacred. However, on the other hand, agricultural movements also had mostly religious characteristics and were influenced by Protestant movements against the supremacy of the Catholic Church (Rashidi, 2011).

• *Master and apprentice*

In the master-apprentice system, the inheritance of fathers' jobs has played an important role. So many artisans have learned their art from their fathers and passed it on to their children. The hereditary aspect of the job has been linked to heredity. This type of tradition, in some ways, had several advantages and led to the reliability of the profession. However, due to the closed and limited scope of education, it has prevented the expansion and development of these jobs in the community and among different groups of people. For this reason, it has delayed the introduction of different attitudes and teachings in these professions; however, it must be acknowledged that the existing socio-political and even economic system has not been ineffective in such a mechanism. Master is the first and last man. Master's words should be done without any questions or answers. This phenomenon, which seems very authoritarian in appearance and does not meet any of the new educational standards, was easily implemented, because: if the teacher was not a father, he would have played the role of godfather and had an emotional relationship with the student. The master was a symbol of professional skill, wisdom and experience. The master was an employer, a planner, and an economist. He had spent his apprenticeship and therefore was naturally a manager, obedient and teachable, and the natural management of the teacher is one of the most important rules and regulations of this educational system. The subject of education was quite clear, given the limited professions. The student had to learn all the jobs or tasks that were in the shop (Hejazi and Kheirkhah, 2005).

Second period: The Industrial Revolution and the emergence of the factory system (or the European Industrial Revolution in England since 1760)

The meaning of the industrial revolution is the replacement of the machine in the position of man in industry (Karimian and Attarzadeh, 2012). One of the direct consequences of the Industrial Revolution was the emergence of large factories in industrial societies, which for the first time provided employment and concentration of large numbers of workers in one place and under one roof. Intensification of differences in social classes, disregard for emotional aspects and non-observance of human principles in factories were among the features of the new industrial system. The Industrial Revolution had positive economic effects and negative social effects (Seyedjavadin and Jalilian, 2019).

Third period: The emergence of modern and capitalist companies (17th century)

With the advent of modern companies, manpower tasks were performed by trained individuals. This unit has a place in the organization and structure and personnel affairs were defined in it. Areas of selection and training were defined as key actions in human resources (Obedgiu, 2017).

Fourth period: Scientific Management, Social Welfare Movement and Industrial Psychology (Late Eighteenth Century)

• Scientific management

The early movement of the scientific management perspective began with the work of "Frederick Winslow Taylor" in the late nineteenth and early twentieth centuries. Contributions from others such as "Frank Villian Gilbert", "Henry Gantt", and "Charles Badeks" extended it. Taylor and his followers insisted that scientific analysis of workers' tasks was possible to discover procedures for maximizing productivity with minimum data, such as energy and materials. These efforts focused on the analysis of the individual's duties, but inevitably led to changes in the overall structure of work arrangements (Seyedjavadin and Jalilian, 2019).

Principles of scientific management (Taylor multiple principles) are (Moghimi, 2019):

1. Scientificizing the activities of each job
2. Careful selection of employees
3. Accurate training of employees
4. Support of employees.

More precisely, the four principles of scientific management are the creation of correct knowledge, scientific selection and training of employees, coordination, cooperation or division of tasks between managers and employees.

• *Social welfare movement*

Social welfare is a category that has long occupied the human mind and many thinkers have tried to achieve this human ideal and have suggested various ways to achieve it. Ever since Socrates spoke of human well-being and public happiness in the main square of Athens, and has introduced concepts such as justice, happiness, comfort, and hope, until Plato, the disciple of the idealist, pursued the plan of the utopia, as a social policy for welfare, security and the provision of ideals, in all these periods the human mind has not been unaware for a moment of thinking about well-being and happiness. With the advent of thinkers such as Hobbes, Rousseau, Locke, and Marx, two discourses or social paradigms emerged. One of them defended the government's non-interference in social, economic and cultural affairs, and the other supported the government's strong presence and intervention. The first group encouraged liberal ideas. Thinkers such as Locke, Rousseau, Smith, Popper, Hayek, Nazik, etc. fall into this category. The second group also defended socialist and Marxist teachings. After the emergence of economic and social crises in classical and neoclassical liberal governments, some thinkers attributed the emergence of these crises to the chaos that arose in the absence of the government. Because most liberal thinkers did not believe in government intervention in economic affairs and considered government intervention as a source of corruption, rent and reduced motivation and creativity in individuals and people's dependence on the government system (Seyedjavadin and Jalilian, 2019).

• *Industrial Psychology*

Due to the application of the principles and theories of psychology in industry, a new field called industrial psychology was gradually added to the sciences in the 1890s and early 1900s. In a famous book published in 1913, "Hogmansterberg" argued that some employees are better suited for certain tasks than others. Hogmansterberg designed tests that could measure the difference between a person's talents and abilities. How to study and analyze a task in order to determine the conditions: physical, mental and emotional required to do it and also designing tests to identify and select the most suitable people, are among the most important tasks.

Fifth period: World War I and the rise of the HRM profession in the 19th century

World War I was a major military battle between several countries. This battle took place from 1914 to 1918 (Kamali, 2012). This war became known as the First World War, a war to end all wars, and the Great War. Millions of innocent people have been either killed or migrated to other places. In World War I, chemical weapons were used for the first time (Vilches *et al*., 2016). The war began after the Austro-Hungarian Empire declared war on Serbia. The battle, which at first seemed like a small conflict between the two countries, spread rapidly and was soon joined by Germany, Russia, Britain and France. The reason for joining these countries was to join treaties that obliged them to defend other countries. The eastern and western fronts quickly opened on the borders of Germany, Austria and Hungary.

HRM during World War I:

In 1913, one of the oldest professional HR associations, the Institute for Personnel and Development, was formed as the Workers' Welfare Association in England. Then, a decade later, it changed its name to the Industrial Welfare Institute. In the same years, the first institution of higher learning was formed in the United States to study labor and labor relations. It was located at Cornell University in the United States (Obedgiu, 2017).

Examples of HRM proceeding in the nineteenth century include:

· Establish mechanisms for selecting tribal leaders

· Record and disseminate knowledge in the field of health, safety, hunting and food collection

· The use of different methods of screening employees by the Chinese

· The use of the internship system by the Greeks

· The emergence of trade unions

· Development of personnel measures including welfare and administrative affairs in the United Kingdom and the United States

· Increase motivational practices

· Improving wage and working conditions (Tubey *et al*., 2015).

Sixth period: After World War II - Human Relations Movement (Integration of the human factor in scientific management): 1960-1945

The studies, known as Hawthorne studies, were conducted at the Western Electric Company plant in Hawthorne, Illinois, USA, led by Elton Mayo (Moghimi, 2020). Hawthorne's studies began with a view similar to that of scientific management, but eventually led to the human relations movement in management. The human relations movement also led to the establishment of the basics of organizational behavior to study the behavior of individuals and groups in the organization (DuBrin, 2013). In above study, suitable physical conditions of work such as light, duration of work, rest, sound, movement, etc. were studied by engineers. First, all physical condition improved. Conditions had improved, and therefore the production of workers increased. Then all of a sudden, the engineers reduced the facilities and things got worse. Production was expected to decline but this did not happen. Under these circumstances, Hawthorne's work was discovered. Hawthorne's effect states that: The behavior of managers and employees' attitudes toward their managers affect the level of employee performance (Herzberg, 2008).

Examples of HRM Measures after World War II - The Human Relations Movement:

• The human relations movement at that time formed the ethics of management

• Emphasis on employee productivity through various motivational methods

• Emphasis on staff welfare issues

• The emergence of task descriptions

• Improvement in staff recruitment and selection

• Emergence of service compensation and performance appraisal strategies

• Recognition of trade unions in different countries

• The emergence of collective bargaining to increase employee welfare

• Adopting many laws in the field of employment

• Emergence of technology and use in recording employee information

• The advent of job analysis

• Development of personnel departments such as employment, labor relations, training, benefits

• Applying technology in the field of payroll (Tubey *et al*., 2015).

Seventh period: The Golden Age of Industrial Relations and Personnel Management and Maintenance Function (1980-1963)

This period saw an unprecedented increase in US labor law. Laws that dealt with various aspects of employment relationships, such as the prohibition of discriminatory measures, the promotion of safety and health, and tax regulations. Technology had advanced during this period, so productivity improve and costs reduced. In the field of human resources, technology was used to process information (Bin Asdar, 2019). The term HRM has been introduced since 1980 and has its roots in the human relations approach since the 1950s and 1960s. HRM with a human relations approach, paid attention to the internal dynamics of the working groups. The desire to create social cohesion and agreement on values was created through organizational culture. Measures were taken to integrate personnel issues and overall business strategies. Many efforts were made to promote commitment and participation. Emphasis was placed on employing employees to the best of their ability. HRM was introduced as a set of policies to maximize organizational cohesion, employee commitment, flexibility and quality of work (Collins *et al*., 2018).

A set of HRM proceedings in the golden age of industrial relations (1980-1963):

• The civil rights movement shaped the thinking of the management of the time

• With civil rights, all forms of discrimination were abolished and equal job opportunities were created

• The transition period was from personnel management to HRM

• Various HR tasks were computerized to improve accuracy, speed, storage and reporting

• Increased trade unions led to improved working conditions and staff

• Various laws were passed in the areas of safety, health, retirement benefits and tax regulations

• Employees participated in decisions

• Employee training and empowerment improved (Tubey *et al*., 2015).

Eighth period: The Emergence of HRM field in the Cost-Effective Age (Early 1990-1980)

In the human resources unit, the volume of administrative work was intensified due to the increase in legal requirements. But the focus of overall performance shifted from administrative to staff development and participation. In order to improve the efficiency and effectiveness of service delivery by reducing costs and added value of services, the HR unit was pressured to become cheaper and stronger through technology. Technology is cost-effective, and many organizations have moved to use it. In addition, organizations began to build networks and, with the development of personal computers, allowed organizations to harness the power of central and local computers to support HR operations. This allowed managers and employees to have access to HR information in their workplace (Bin Asdar, 2019).

A set of HRM measures in the era of cost-effectiveness (1980-1963):

• Increase workplace automation to increase production;

• Shifting attention from administrative affairs to development affairs and staff participation;

• Emphasis on efficiency and effectiveness through the use of technology;

• Emergence of hard and soft HRs approach;

• The advent of employee returns on investment: Minimize or eliminate unnecessary staff costs or expand vital resources (Tubey *et al.,* 2015).

Ninth period: The period of strategic focus on HRM and moving towards corporate functions and the importance of international and political perspectives (from the early 1990s to 2010)

The economic landscape entered the global arena during the 1990s and increased competition. Strategic HRM became important in management thinking and actions, and human resources and intellectual capital of employees were used as strategic assets and competitive advantage to improve organizational performance. A good example of human resources and information provided by information systems is human resources in the HR planning system. HR planning predicts the HRs needed in the future and access to it inside and outside the organization (Lengnick *et al.,* 2011). According to this system, the organization can estimate the number and quality of HRs inside and outside the organization. During this period, the efficiency of HR support technologies also changed significantly. In the late 1990s, integrated enterprise resource planning software was introduced that integrated data from finance, accounting, marketing, manufacturing, human resources, and sales (Bin Asdar, 2019). By considering the importance of HR skills in achieving organizational goals, the HRM unit has a significant role in the realization of organizational strategies and is inherently a strategic category. Strategic HRM is a combination of strategic management and HRM, in order to achieve strategic goals (Armstrong, 2011). In strategic HRM, two axes are emphasized:

• Link or alignment between human resources and organizational strategies

• Positive relationship between HR activities and organizational performance

Since the goals of the organization are achieved by individuals, the quantity and quality of these people is very important in achieving the goals and given the basic role of HRM in this area, the need for a strategic view of HRM in organizations is inevitable. In addition to employee motivation and intra-organizational variables, HRM measures are very important in determining shareholder profits, customer satisfaction and community support (Gholipour, 2019; Ramli *et al.,* 2021). Globalization has progressed rapidly over the years. Because the economy has become globalized and many companies have a major share of sales and profits outside the country, for example, US multinational corporations have foreign sales of more than $ 500 million a year. Globalization has had a major impact on HRM and has raised issues such as:

• How can a company, build factories around the world with a mix of different nations?

• How to attract, select, train and employ human resources in different countries?

• What characteristics and factors influence HR decisions in different countries (Mathis *et al.,* 2015).

Features of this course include:

• Significant increase in various factors of globalization, rapid changes due to technological advances and pressure to increase efficiency

• Increased competition in all industries

• The advent of strategic HRM

• Emergence of business process reengineering strategies

• Attention to intellectual capital

• Apply appreciation, reward and motivation strategies

• Awareness of the strategic role of HRs as a strategic business partner

• Emergence of improved strategies for attracting, retraining, developing and sharing talents

• The advent of labor performance evaluation methods such as the Balanced Scorecard

• Emphasis on the role of HRM in the organization's competitive advantage

• Manpower planning methods

• Diversity management

• Talent management (Tubey *et al.*, 2015).

Tenth period: HRM in the age of cloud and mobile technology (2010-now)

Over the past few years, new changes have taken place in HRM, most of which are related to technology. In 2010, protection and positive action laws were passed and health regulations were added. Instead of an enterprise resource planning system, organizations have moved to mobile-based HR systems, trying to take advantage of social networking capabilities and web tools (Stair and Reynolds, 2015). This was an obstacle to HRM. They have learned in the past to control HR data in the organization's internal systems. But new systems such as Twitter, Facebook and Instagram were out of their control (Bin Assad, 2019). The use of cloud technology in HRM has enabled organizations to manage their human resources more efficiently, with lower communication costs and higher productivity (lv *et al*., 2018).

According to a survey conducted by "Kadar Christon" on the attractiveness of mobile-based HR systems, the following results were obtained:

• View salaries and make changes

• Recruitment and talent identification

• Performance management system, in which employees view their performance appraisal results online and engage with managers

• Available learning and development

Statistical analysis also shows that mobile-based processes in the organization have led to:

• Improve employee participation

• Higher levels of managers have access to information and decisions are improved

• Through this technology, organizations can reach and attract talented people (Lv *et al.,* 2018).

Today, cloud computing in human resources turns traditional HR processes into added value in business (Cai and Chen, 2021; Wang *et al.,* 2016). This software not only transforms the performance of HR technology, but also improves the performance and success of human resources in the organization. The five main processes that occur with cloud computing in human resources include the following:

• Recruitment Technology: This technology helps identify and attract ideal candidates and has a recruitment management module for marketing and recruiting top talent. This technology provides the ability to monitor the organization in the recruitment process. When a candidate submits his or Recruitment her application, all information is provided to the organization.

• Processing technology: The first few days of an employee's presence in a company are crucial, and this technology can help new hires succeed and contribute to the processing of accurate personal information.

• Office Technology: This technology facilitates HR processes from HR planning to payroll, as it integrates and makes data available. Managers can use this technology to have a complete picture of their team.

• HR Performance Technology: This technology helps the organization align employee development, evaluation, and reward with organizational performance. Managers make decisions about employee rewards using performance data.

• Development Technology: Employees use this technology to access their training and development modules. This technology implements staff development measures professionally. Professional development tools help to train employees and improve organizational performance.

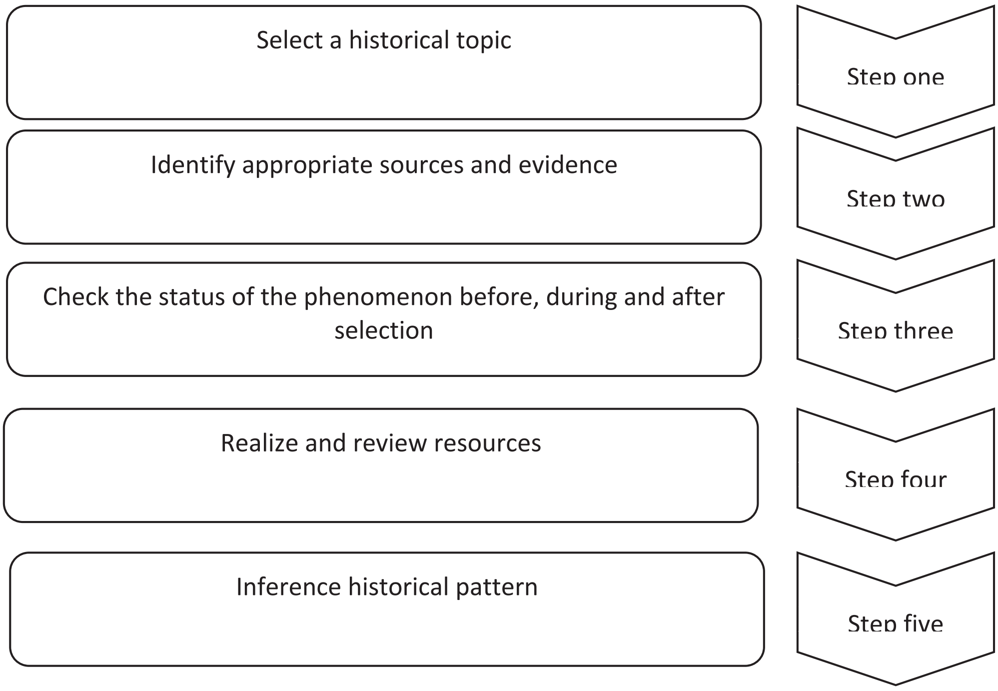

Fig. 1: Stages of historical research (Sager and Roser, 2015)

Looking ahead and using cloud computing, the HRM of organizations, manage their human resources and increase the productivity of the organization more secure, effective and cost-effective, (Lv *et al* ., 2018). The purpose of this study is to investigate the historical trend of HRM in the world, Iran and Municipality of Tehran in the last one hundred years (1921-2021). The current study has been carried out in Tehran in (1300-1400).

MATERIAL AND METHOD

In this research, the philosophy of interpretive research, inductive research approach, historical research strategy and qualitative research method have been selected. The method of data collection was using documents and conducting semi-structured interviews. For this purpose, non-random and purposeful individuals have been selected from the research community, which includes HR managers. Socio-scientific approaches usually accept the historical method only as a preliminary method that provides evidence for subsequent "secondary methods" such as causal narratives, process tracing, and pattern matching. From this perspective, the former provides a descriptive "database", while the latter focuses on drawing inferences and, ideally, extracting and explaining scientific relationships. According to this view, "researchers use historical narratives for descriptive purposes, that is, documents of what happened and the characteristics of a phenomenon" (Lange, 2012). The stages of conducting historical research are as Fig. 1 (Sager and Roser, 2015):

The statistical population of the research is the documents related to the history of human resource management that have been selected by purposive sampling method. In the interview section, by purposeful non-random sampling method, senior human resource managers who had managerial education and experience in human resource management in Tehran Municipality were selected. The documents used in this research include the items in Table 1:

Due to the fact that this research is faced with qualitative data: text, words, image, etc., the method of qualitative content analysis has been used. Content analysis refers to anyone who uses a technique to infer systematically and objectively

Table 1: Historical documents

	Historical theoretical documents of HRM
Historical documents	Country laws and regulations (from 1987 until now) Municipal laws and regulations (from 1907 until now) Municipal administrative regulations Macro policies of the administrative system Strategic document for the development of human resources of the municipality Five-year municipal development plans Municipal missions Interviews with senior HR managers (since 1987)

the specific features of messages (Shapiro, 2020). In order to increase the reliability of the research, methods have been used which are: review and long-term engagement with data, continuous observation, three-way (data collection from various sources and methods), analysis of conflicting data, review Interpretations of raw data, talking to colleagues, not rushing to present results.

RESULTS AND DISCUSSION

In qualitative content analysis, data analysis begins with repeated reading of the text, immersion, and general understanding (Bengtsson, 2016). The text is then read word for word to extract the code. This process continues continuously from code extraction to naming. The codes are then categorized into separate classes based on their differences and similarities, and at the end, evidence for the text is cited for each concept. Examples of codes, subcategories, and categories are provided in Tables 2 to 5:

In this research, based on the historical research method, the historical course of HRM in three levels of the world, Iran and Municipality of Tehran in the last hundred years was extracted. In the first stage, with the method of qualitative content analysis, the history of HRM in the world was extracted in ten periods. In the second stage, the history of HRM in Iran during four government periods was reviewed and extracted. Finally, the historical course of HRM in Municipality of Tehran was reviewed in three periods. These three levels are described as follows:

Worldwide HRM

· The role of HRM has been administrative at first, then executive and finally strategic, and today, HRM has become a strategic business partner.

· The approach and view of human beings has been instrumental at first, then manpower and then as human resources and finally has moved to human capital.

· Various HRM activities including: recruitment, selection, training, performance appraisal, development, job design, service compensation system and labor relations have matured during different periods.

· HRM systems from modes: manual, in person, systemic has moved towards the cloud and internet space

· Job design has shifted from simple, repetitive jobs to complex, non-repetitive jobs.

· HR capabilities have become more complex and diverse

· The structure of HRM has moved from administrative and recruitment to HRM and then human capital development

· Employee service compensation has shifted from a purely material to an immaterial and developmental state

· The attention of HRM has moved from the state of attention inside the organization, to the attention outside the organization, customers, stakeholders, competitors, etc.

· Staff development programs have become more complex and important

· In addition to the physical dimension, the mental and psychological dimensions of employees have become important

· Employee competencies have moved from quantitative and rigorous to quality and soft

· Getting things done has moved from in person to virtual and remote

Table 2: Qualitative content analysis of the slavery period

Row	Keywords of texts (interviews, observations and documents)	Tags / codes	Subcategories / subclasses	categories / classes
1	Slaveholding means the domination of one person over another	Hostile relations between worker and employer	Labor relations	HR maintenance
2	It is a domination that destroys all the personality of the person who is the subject of domination	An instrumental approach to the workforce	Recruitment and employment	Provision of human resources
3	Slaveholding and the slave trade were legally recognized by most societies	Governance of law of slavery	Labor relations	HR maintenance
4	Slaves were considered the legal property of their owners	Labor as an asset	Recruitment and employment	Provision of human resources
5	Due to the creation of privileged social classes, nobles and aristocracy, the issue of enslavement of human beings also arose	Social classification system	Job classification	Utilization of human resources
6	Due to the inability of the upper classes in agriculture and animal husbandry, the need to employ other people to do hard work was felt	Employing labor in hard jobs	Job design	Utilization of human resources
7	Slavery, cconsidered as a genuine social law, they based their political and social philosophy on it	Governance of law of slavery	Labor relations	HR maintenance
8	Introduced slavery as a natural thing and considered slavery not as a human being, but as a tool along with other tools	An instrumental approach to the workforce	Recruitment and employment	Provision of human resources
9	The inequality of human beings was a natural thing and slavery was interpreted as part of the nature of slaves	Inequality of human beings	Equal opportunity	HR maintenance
10	Influenced by the common custom and beliefs of the scientists' opinions of that time, buying and selling human was commonplace as the legal slave trade	Manpower trade	Salary	Utilization of human resources
11	People are bought and sold as commodities, They are forced to work	An instrumental approach to the workforce Employing labor in hard job	Recruitment and employment Job design	Provision of human resources
12	Violence and threats are used against them and the lives and work of these victims continue in unfavorable conditions	Hostile relations between worker and employer unsuitable working conditions	Labor relations Safety, health and wellness	HR maintenance
13	This type is the main form of slavery in which slaves are considered the property of their owners and traded	Labor as an asset	Recruitment and employment	Provision of human resources
14	Individual slavery offers its labor for free against a debt. The duration of this type of slavery may not be known, and even children may be forced into slavery because of their parents' debt. This type of slavery is the most common form	Forced labor	Salary	Utilization of human resources

Continiued Table 2: Qualitative content analysis of the slavery period

Row	Keywords of texts (interviews, observations and documents)	Tags / codes	Subcategories / subclasses	categories / classes
15	This type of slavery occurs when a person is forced to work against his master's violence or punishment, restricting personal freedoms against his will	Forced labor	Salary	Utilization of human resources
16	During this period, manpower in society was divided into three categories: those who worked for themselves and marketed their products, slaveholders and slaves	Social classification	Job classification	Utilization of human resources
17	Some did not have specific working hours, job descriptions, working conditions and regular rules and were completely subject to the will of the owner. The owners referred to them at any time and at any time.	No specific working hours Lack of specific job descriptions There are no specific working conditions Full citizenship of the employer	Safety, health and wellness Safety, health and wellness Safety, health and wellness Labor relations	HR maintenance
18	The slaves did not have enough food to eat and an early life, and that was enough for the owner. The owners did not pay any attention to their hours, working conditions, rewards and benefits, training, etc.	Food supply for the workforce Provide primary life No specific working hours Lack of favorable working conditions Lack of appropriate rewards and benefits Lack of adequate training	Salary Salary Safety, health and wellness Safety, health and wellness salary Education and development	Utilization of human resources HR maintenance Utilization of human resources human recourse development

HRM in Iran

· managing human resources has moved from absolute and focused to participation and excellence mode

· Iran is one of the countries that has started training and employing women in organizational jobs since the beginning of 1920.

· The employment law of the country has been changed during three periods in 1922, 1966 and 2007 and has moved towards legalizing the administrative system, reducing discrimination, central justice and creating equal opportunities.

· HRM has historically moved from its administrative position to its executive and development position

· The various actions of HRM in recruitment, selection, training, growth and promotion, performance appraisal and service compensation, have moved from a job-oriented approach to employed-oriented, and in the direction of competency-oriented

· Methods of doing work have moved from face-to-face to hybrid (in person and remote)

· Selection and employment, on equal terms, has moved towards centralized recruitment tests

· Training has shifted from general to specialized and professional

· In the path of selection and appointment, new tools such as evaluation centers are used

· The service compensation system has moved from a job-based payment mode to a performance-based payment

· In business design, competency models are used, especially at the managerial level

· Job capabilities and capacities have become more precise and special

HRs management in Municipality of Tehran

· HRM in Municipality of Tehran has moved from an administrative to an executive role in recent decades

· HR processes have moved towards intelligency

· The administrative structure has become a developed structure of human resources

· Due to the coronavirus, activities are performed remotely

Table 3: Qualitative content analysis of HRM worldwide

Worldwide HRM	The period before the Industrial Revolution – Slaveholding	supply	Purchased labor as tools and assets
		Use and maintenance	Under difficult conditions - without job description, Definite working hours, rewards, benefits and unfavorable environment
		Development	Employment in difficult jobs without training and career prospects
	The period before the Industrial Revolution – Arbab – serf	supply	Instrumental approach and hostile relations, owned by landowners
		Use and maintenance	Perform difficult tasks such as farming To meet basic needs - food and clothing
		Development	No training and career prospects
	The period before the Industrial Revolution – Master-student	supply	Choice based on cognition and family and friendly relationships
		Use and maintenance	Providing a variety of needs for food, clothing, housing and Material and spiritual support while providing service to the master
		Development	Transfer of knowledge, skills and experience in the career path Errand boy, Apprentice, foreman and master
	Industrial Revolution	Supply	Selection based on type of work and division of labor
		Use and maintenance	Employment in simple and repetitive jobs and pay based on production
		Development	Holding workers' training courses
	The appearance of modern companies	Supply	Formation of personnel affairs
		Use and maintenance	Holding training courses
	Scientific management	Supply	Selection by scientific methods - the fit of the job and the employee
		Use and maintenance	Job analysis and simplification
		Development	Holding scientific courses
	World War I	Supply	Use different screening methods
		Use and maintenance	Measures in the field of welfare services, motivation and Service compensation
		Development	Do an internship
	After World War II	Supply	Pay special attention to the choice of force
		Use and maintenance	Attention to motivational issues - immaterial factors - welfare services and formalization of unions
		Development	Implementation of specialized training
	Industrial relationships	Supply	Pay attention to equal opportunity
		Use and maintenance	Paying attention to employee participation, safety and health - increasing trade unions
		Development	Holding professional training
	The emergence of HRM	Use and maintenance	Emphasis on efficient and effective use of human resources
		Development	Focus from administrative to developmental affairs
	Strategic focus on HRM	Supply	HR forecasting and talent management
		Use and maintenance	Measures in the field of welfare services, incentives and compensation services
		Development	Strategic training planning
	HRM in the age of cloud technology	Supply	Recruitment and IT based hiring
		Use and maintenance	Designing and executing jobs in combination
		Development	Holding training based on information technology

Table 4: Qualitative content analysis of HRM in Iran

HRM in Iran	First period: 1921-1941	Supply	Formulation and implementation of the first employment law, employment of employees from social strata, provided that they have the criteria of rational selection (necessary expertise and knowledge)
		Use and maintenance	Lack of trust and lack of employment of young people in various positions, employment of women in lower positions, development of various punishments
		Development	Development of educational centers, increasing the level of education of the community, studying abroad, incompatibility of the field of study with the jobs of the country, lack of proper educational needs assessment, entrance exam for ranking and regular scale for promotion, types of formal and honorary promotion
	Second period: 1941-1978	Supply	Develop and implement the second employment law, appointment and promotion based on merit and competence and talent and intellectual growth and experience in previous jobs, preserving the interests of those in power. Loyalty to the king is a condition for holding political positions, women's dignity (beauty and attractiveness)
		Use and maintenance	All jobs in this law are divided into twelve groups and based on the importance of duties and responsibilities and tenure conditions in terms of information and experience, classification and for assignment to one of the groups is proposed to the council. The unit is determined based on the number one hundred
		Development	Approval of the continuation or implementation of training or internship programs for employees by the Administrative and Employment Organization
	Third period: 1978-1989	Supply	Selection of human resources according to the pillars: countering influence, meritocracy, central justice and orbital province. Talent acquisition and talent development, meritocracy
		Use and maintenance	Creating equal opportunities and conditions in payment and employment in organizational positions
		Development	Emphasis on education, especially ideological and moral education
	Fourth period: 1989 so far	Supply	Implement the third employment law, determine recruitment qualifications and implement all types of formal and contract employment
		Use and maintenance	Payment system based on evaluation of job and employment factors, calculation of points obtained from evaluation results, do duties by observing accuracy, speed, honesty, trustworthiness, openness, fairness and following the general and specific rules and regulations of the device and Equal accountability to clients
		Development	Implement empowerment programs and increase the skills and job abilities of employees and managers, establish performance management

· Decentralized absorption has moved towards focused and competency-based absorption

· Training, development, empowerment and performance appraisal are considered

· Due to the diversity of different organizations in Municipality of Tehran, HR planning and management is faced with various issues such as: diversity in recruitment, diversity in compensation of services, diversity in education and like that.

· Developments in municipal HRM in the third period are extensive and measures such as: implementation of evaluation center, development of educational trips abroad, establishment of knowledge management, performance management, succession breeding, elite breeding and process intelligence are some examples.

Table 5: Qualitative content analysis at the municipal level

HRM at the municipal level	First period: 1320-1300	Supply	Determining the selection conditions: having full Persian literacy, not being less than 25 years old and not attending government service, election of the mayor by the Ministry of Interior and its approval by the government and the association, employment of members of the municipality according to importance and needs
		Use and maintenance	Carrying out division of labor in the internal affairs of the municipality, consulting the members of the municipality in the field of municipal administration and determining the level of salaries and wages: the total salary of members and employees of the municipality should not exceed 10% of the annual income of the municipality
	Second period: 1357-1320	Supply	Selection of municipal employees from among official and low position employees, cleaning agents and drivers of municipal vehicles
		Use and maintenance	Determining the level of members' salaries: at the time of preparing the annual budget, the salaries of members and employees of the municipality are set at 25% compared to the municipalities whose revenue collection is less than one million Rails, and for municipalities that have a revenue of more than one million Rails, it should not exceed 25%
		Development	Sending ten employees abroad with educational conditions equal to at least equivalent to the second year of high school and knowing a foreign language outside the average of two years to study and obtain information in urbanism planning and administrative affairs by receiving salaries and benefits in Rails
	Third period: 1357 so far	Supply	Creating four types of employment: permanent employees, official employees, temporary employees and municipal workers, creating a formal employment process with admission to the entrance exam and competition, creating an appointment: initial cooperation as a 6-month to two-year probationary period and if the behavior is satisfactory and Service status and approval of the selective core Perform formal employment, recruitment and employment based on the core competency approach, establishing a talent management system, establishing a succession system, attracting specialized and elite staff, implementing the evaluation center
		Use and maintenance	Salary: Determining the salaries of permanent and official employees of the municipality according to the law of the coordinated system of payment of government employees, providing health and treatment of employees, creating welfare facilities for employees, creating a suitable working environment, assisting cooperatives in consumption, housing, Giving Loan, Upgrading the level of welfare facilities, establishing employee motivation system, smartening processes
		Development	Holding pre-service training, in-service training, improving the group of employees based on the value of work, responsibilities, importance of duties, empirical background, education and job evaluation, competency-based development with emphasis on management levels, establishing a strategic performance management system for managers and professionals, Establishing a knowledge management system, improving the skills of managers and employees, conducting training abroad

Research suggestions

Based on the results of this research and the comparison of HRM measures of Municipality of Tehran with HRM in the current era, the following suggestions are presented:

- The need to move towards strategic HRM
- The need to move towards HR development
- The need to move towards integrated HRM
- The need to move towards the attitude of human capital
- Moving towards the maturity of HRM
- Designing jobs with a combined approach

· Review the structure of HRM

· Moving towards a citizenship and social perspective

Research innovation

What can be considered as an innovation in this research is the concept of "urban HRM". This management is based on: The three areas of HRM, urban governance and sociology should be focused on specialized areas and roles of HRM in the context of urban affairs and citizens' lives by creating urban administrative mechanisms and procedures in order to manage urban human resources.

AUTHOR CONTRIBUTIONS

M. Alizadeh has prepared a roadmap, developed a method of research and analysis and interpretation of the data and M. Baoosh and A. Rahimy has collected data and compiled a theoretical framework.

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CONFLICT OF INTEREST

The authors of this article do not declare any conflict of interest with the publication of this article. Various ethical issues such as plagiarism, fabrication, data forgery, informed consent, duplication, submission and redundancy have been controlled.

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ABBREVIATIONS

CEA	Cost-Effective Age
CMT	cloud and mobile technology
HA	Historical Approach
HRM	Human Resource Management
IP	Industrial Psychology
IR	Industrial Revolution
PBIR	period before the industrial revolution
SHRM	strategic Human Resource management
SM	Scientific Management
SWM	Social Welfare Movement

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