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From Editor

In this issue of "International Journal of Electronics, Mechanical and Mechatronics Engineering (IJEMME)", we have especially selected the scientific areas which will cover future prospective Engineering titles such as Robotics, Mechanics, Electronics, Telecommunications, Control systems, System Engineering, Biomedical, and renewable Energy Sources.

We have selected only a few of the manuscripts to be published after a peer review process of many submitted studies. Accepted papers are as follows:

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Prof. Dr. Osman N. UCAN
Editor in Chief

Implementation of Aggregate Signcryption in Unattended Medical WSNs using Micaz

***Faezeh S. BABAMIR*[1]**

Abstract

Healthcare applications are promising fields for wireless sensor networks called wireless medical sensor networks. The main issues in wireless medical sensor networks are reliable communication, patient mobility and security of sensed physiological data. In order to mobile patient monitoring, disconnected or unattended setting of wireless medical sensor networks is considered. The disconnected property causes periodic or offline data delivery of information. Moreover, medical sensors nodes should retain data for long time while they have limited battery and capacity. These challenges provide attacker to threat security of sensed data without being detected. In this paper, we propose an efficient aggregate signcryption technique to provide simultaneously confidentiality, integrity (by encrypting) and authenticating (by signing) for collected data. Moreover, the aggregation property reduces communication and space overhead as well as signcryption provides time efficiency by applying mostly linear operators. We further, compare our technique with the nest alternative works in the literature to show the efficiency and resilience against various attacks.

Keywords: unattended wireless medical sensor networks, confidentiality, integrity, authenticity, space overhead.

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1. INTRODUCTION

Wireless Sensor Networks (WSNs) are emerging technologies which are recently attracts many researchers. A wireless sensor is a small, low power and low capacity unit of a network that can be implemented in large scale environments. These networks have many applications such as military, water monitoring, healthcare and etc. in this paper; we consider healthcare application with a disconnected WSN. Moreover, we consider disconnected or Unattended Wireless Medical Sensor Network (UWMS). Generally, a wireless medical sensors maybe wearable, implantable or potable and also can be integrated in various kind of motes including Mica2, Micaz and Telos [1]. Unattended WMSNs are deployed on patient body to closely monitor physiological patient conditions, providing a patient has locomotion and is not always in the access of doctor or caregiver. In other words, the patient would be periodically present to log his physiological data. These physiological data should be 1-confidential: because patient health data are generally held under the legal obligations as well as should be available just for doctors or caregivers. Moreover, data eavesdropping by an adversary causes breaching the patient privacy.

2-authentication: data authorization in UWMSNs is a must for every medical sensor to verify by a trusted receiver e.g. doctor. 3-Integrity: the system should have integrity to guarantee that physiological data is not altered. Data modification in WNSNs is very dangerous, since it can mislead the doctor and threats the patient life.

To achieve confidentiality and authenticity traditionally, encryption and *then* signature (message authenticated code) are often combined. The traditional way is infeasible with the disadvantages: (1) heavy overheads; (2) lack of security. Zheng proposed a novel concept named *signcryption* to perform the encryption and signature in a single simoltaneous primitive [2]. Zheng's conception is unpractical for increasingly popular ubiquitous communications. Bao and Deng improved it and gave a signcryption that can be verified publicly in 1998 [3].

In this paper, we propose a new aggregate signcryption to achieve more functionalities. Moreover, since this technique includes some efficient order functions such as addition,

Elliptic Curve Cryptography (ECC) multiplication (one of the main advantages of ECC is small key size [4]. A 224-bit key in ECC is considered to be secure as a 2048 key in RSA [5]. the broadcast cost significantly is reduced. Also, we apply aggregation mechnism to decrease and compress amount of data. First advantage exceeds the lifetime of networks, while second advatage, helps either sender and receiver to run the proposed technique in efficient time and space orders.

This paper is organized as follows. Section 2 reviews related work, followed by Section 3 which introduces our environment assumptions and definitions. Then, Section 4 provides our proposed aggregate signcryption. In section 6, we explain the implementation our practical technique. Section 7 describes proof of security. Section 6 sketches our technique compared to another work. Finally, Section 8 presents our conclusions and future work.

2. RELATED WORKS

The property that ensures us will be computationally infeasible for an adversary to recover past secret keys of a compromised node if she knows the current value of the key is forward security. On the other hand, backward security guarantees that knowledge of current key cannot be used to disclose any information about future ones.

Muhammad et al. in [6] proposed BARI+ which is distributed key management protocol based on biometric. This wireless body area network (WBAN) is managed by four keys including, communications key, administrative key, basic key and secret key. Huang et al. [7] proposed a secure access. They used a wearable sensor system (WSS) to monitor the vital signals of patient. WSS uses an Advance Encryption Standard (AES) based authentication (i.e. CBC-MAC) as well as encryption scheme. A public key based key establishment protocol is used to establish the secure key. Haque et al. [8] proposed a public key based infrastructure for patient monitoring system using WSN. This scheme is composed of three main components: patient (PT), healthcare system (HSS) and secure base stations (SBSs). A pair-wise shared key and bilateral key handshaking method are applied to the established secure communications between three components. Also, this proposed scheme provides data confidentiality by encryption and decryption.

Contribution: To the best of our knowledge, this paper is the first to identify the problem of data security in UWMSNs, using *signcryption technique*. Using aggregation concept, communication and memory overheads are significantly reduced. Also, we use unknown receiver *secret key* to hide receiver nature. Moreover, the total mission of our scheme is efficiently gathering and transmitting data in which receiver remain anonymous. Finally, our research opens up new directions and identifies challenges in the context of UWMSN security.

3. DEFFINITIONS AND NETWORK ASSUMPTIONS

3.1. Bilinear pairing

Let G_1 be an additive cyclic group generated by g, with prime order $q(=113)$, and G_2 be a multiplicative cyclic group of the same order q with the set. A bilinear pairing is a map $e: G_1 \times G_1 \rightarrow G_2$ with the following properties. For any $P, Q, R \in G$ and $a, b \in Z_q^*$:

- Bilinearity: $e(P+Q,R) = e(P,R)\,e(Q,R)$ and $e(P,Q+R) = e(P,Q)e(P,R)$. In particular, $e(aP,bQ) = e(P,Q)^{ab} = e(P,abQ) = e(abP,Q)$.
- Non-degeneracy: $e(P,P) \neq I_{G_2}$, where I_{G_2} is the identity element of G_2.

3.2. Related Computational Assumptions

In this section, we review the assumptions related to bilinear maps that are relevant to the protocol we discuss.

- Bilinear Diffie-Hellman Problem (BDHP): Given $g, ag, bg, cg \in G_1^4$ for unknown $a, b, c \in Z_q^*$, the BDH problem in G_1 is to compute $e(g, g)^{abc}$.
- Computational Diffie-Hellman Problem (CDHP): Given $A = ag \in G_1$ for unknown $a \in Z_q^*$, the CDH problem in G_1 is finding a.

3.3. Network assumptions

Suppose some UWNS which consists of N sensors and a sink. Sink have to visit the network periodically. Moreover, sensors collect data during *collection intervals,* each of which is divided into *v round*. At the end of each equal round, the collected data will be signcrypted and further at the end of each equal interval, all signcryptions will be aggregated to one unit of data to send. These signcryption are threat by an adversary denoted as ***A*** during an interval. ***A*** is curious or aims to prevent receiving data to the sink or more over, changes the data to deceive sink. In this paper, we propose a new scheme to defend curious adversary by encrypting,

changing data by signing and even deleting them by alerting sink to supply deleted data via other neighbor sensors. Below, we describe the condition of the adversary:

- Compromise power: We envision a powerful mobile adversary. We assume that ***A*** is capable of compromising at most *k* out of *n* sensors within a particular time interval (0 <*k* <*n/2)*. This subset of compromised sensors is not clustered or contiguous. Furthermore, in every interval, ***A*** can migrate and compromise a different subset till occupies the whole of network.
- Limited erasure capacity: Between any two successive sink visits, ***A*** can erase no more than a given number of measurements from the network. Otherwise, this raises an alarm on the sink and contradicts ***A***'s goal of remaining undetected.

Defense awareness: ***A*** is fully aware of any scheme or algorithm that any sensor uses to defense.

4. THE PROPOSED IDENTITY BASED AGGREGATE SIGNCRYPTION

The new Identity Based Aggregate Signcryption scheme for unattended WSNs consists of algorithms *Setup, KeyGen, Signcrypt, Aggregate-Signcrypt, Unsigncrypt,* and *Aggregate-Unsigncrypt* which are explained as below. Suppose identity *ID* signcrypts messages m_i and finally aggregates them. Note that the signature of our scheme is inspired from [9].

- **Setup:** Let *d* be a security parameter of the system. We define an Elliptic Curve *E* on a finite field $GF(2^v)$ where *v* is a prime power number. Let G_1 be an additive cyclic subgroup of the group of EC points (included infinity point O_E) with *g* and *q* as generator and prime order of G_1respectively.Also we let G_2 be a multiplicative group with prime order q Z_q^*. We define a function $f(x) = \log_p(x)$ where $x, f(x), p \in Z_q^*$ Let *e* be a "Bilinear Map" (BM) defined by $G_1 \times G_1 \rightarrow G_2$ that $e(g,g) = p$. Let H_i be the following hash functions:

$$H_1 : G_1 \times \{0,1\}^* \rightarrow Z_q^*,\ H_2 : G_2 \times G_2 \times \{0,1\}^* \rightarrow G_1,$$

$$H_3 : G_1 \times G_1 \times \{0,1\}^* \rightarrow Z_q^*,$$

$$H_4 : G_1 \times \{0,1\}^* \rightarrow \{0,1\}^{|ID|+|m|+|q|}$$

Where |ID| and |m| are the length of *ID* and message *m* respectively. Let ID_B is the identity of receiver and the Master private key *"Msk"* be $x \in Z_q^*$ and the master public

key $X = xg$. Therefore, the public parameter is:

"Params" = <G_1, G_2, X, g, e, H>, $Msk = x$

- **KeyGen*(ID)*:** To generate a partial secret key for identity *ID*, the *KeyGen* selects $r \in Z_q^*$ at random, computes:

$$R \leftarrow rgx^{-1},\ s \leftarrow rx^{-1} + xH_1(R, ID) \bmod q,$$

We call $H' = H_1(R, ID)$. The sensor partial private key is (R, s). A correctly generated secret key should fulfill $sg = R + XH'$ (1).

- **Signcrypt(m_i, *ID*, ID_B, (*R*, *s*), *j*):** Signcrypt algorithm inputs a message, sender identity *ID*, receiver identity ID_B, sender partial private key and interval number. Let $Y_i = gy_i^{-1}$ .For every message, we have:

$(y_i, K) = StartRoundKey(i, j, ID, (R,s))$,

$y_{i+1} = MessageKey\text{-}Generator\ (y_i, ID, (R,s))$,

$$Z_i \leftarrow y_i + sH_3(Y_i, R, m_i) \bmod q,$$

$$C_i = P[i \| m_i \| Y_{i+1}] XOR [H_4(Ry_i^{-1}, ID)]$$

The signcryption of message m_i is

$$\delta_i = < C_i, Z_i, K >.$$

- **Aggregate-signcrypt(σ_i, *ID*):** On receiving *n* individual signcryptions $\delta_i = < C_i, Z_i, K >$, where *i=1* to *n*(all *K* are the same) and identity *ID* as sender. The output is the aggregation <*K*, Z_{agg}>.

$$Z_{agg} = \sum_{i=1}^{n} Z_i,\ \delta_{agg} = < K, \{C_i\}_{i=1}^{n}, Z_{agg} >$$

- **Aggregate-Unsigncrypt(σ_i, *ID*, (*R*, *s*), *j*):** The receiver executes the algorithm with $\delta_{agg} = < K, \{C_i\}_{i=1}^{n}, Z_{agg} >$, sender identity *ID*, its partial private key and interval number *j*. This algorithm outputs $m_i, \forall i$ for every valid message otherwise it outputs *false*.At the begining of the interval *j*, thesensor computes $Y_1 = MessageKey\text{-}Discoverer(K, ID, (R,s), j)$. Then for every message, we have:

$$i \| m_i \| Y_{i+1} \leftarrow [C_i] XOR [H_4(rY_i, ID)],$$

$$h_i \leftarrow H_3(Y_i, R, m_i),$$

To verify the aggregate signcryption δ_{agg} for message m_i and identity *ID*, the verifier should computes h_i for $m_i, \forall i$.

Verification:

if $e(gZ_{agg}, g^{-1}) = \prod (e(Y_i^{-1}, g) e(g^{-1} h_i, R + XH'))$ then pass output (m_i) corresponding to *ID*, else output *"Invalid"*.

Correctness:

$$e(gZ_{agg}, g^{-1}) = e(g\sum(y_i + sh_i), g^{-1}) = e(\sum gy_i, g^{-1}) e(\sum gsh_i, g^{-1}) =$$
$$e(\sum Y_i^{-1}, g) e(\sum h_i g^{-1}, gs) = \prod e(Y_i^{-1}, g) e(h_i g^{-1}, R + XH')$$

- *MessageKey -Generator (y_i, ID, (R,s)):* This function input the current round key,

ID and its partial private key and outputs a key $y_{i+1} \in Z_q^*$ for the next round.

$$y_{i+1} \leftarrow PRNG(y_i) \bmod q$$

- *MessageKey-Discoverer(K, ID, (R,s), j):* This function inputs seed *K*, *ID,* its partial private key and interval number. It outputs a key rY_1 for receiver.

$$w = e(K, X) = e(y_1 H_2(s, j, ID_B), xg) = e(g, g)^{y_1 x_j x} = p^{y_1 x_j x}$$
$$rY_1 = \frac{H_2(s, j, ID_B)(r)}{f(w)} = \frac{x_j gr}{\log_p(p^{y_1 x_j x})} = \frac{x_j gr}{y_1 x_j x} = \frac{R}{y_1}$$

- *StartRoundKey(i, j, ID, (R,s)):* This function input the current round key number, interval number, sender *ID* and its partial private key and outputs a key $y_1 \in Z_q^*$ and corresponding seed $K \in G_1$. At the beginning of the interval, (i.e. *i=1*). This function selects a random key $y_1 \in Z_q^*$ to compute:

$$K = y_1 H_2(s, j, ID_B) = x_j Y_1, x_j \in Z_q^*$$

Otherwise ($i \neq 1$), the function outputs current (y_i, *K)* located in the sensor memory.

5. PROOF OF SECURITY

In this section, we present two probability analysis proofs.

5.1. Confidentiality

The identity based aggregate signcryption scheme is ($\varepsilon, t, q_k, q_s, q_h$)-secure against IND-IBAS-CCA2 adversary ***A*** under adaptive chosen identity and adaptive chosen ciphertext attack in the random oracle model if Elliptic Bilinear Diffie Hellman Problem (EC-BDHP) assumption holds in G_1.

$$\varepsilon' = (1 - \frac{q_s(q_s + q_2 + q_3)}{q})(1 - \frac{q_u}{q})(\frac{1}{q_1})\varepsilon \quad (1)$$

$$t' = t + O[(q_k + q_s + q_u)E_m + q_u E_e] \quad (2)$$

And q_1, q_2, q_3, q_k, q_s, q_u and q are the number of H_1, H_2, H_3, *KeyGen, Signcryption* and *Unsigncryption* queries respectively. E_m and E_e is the time for multiplication and bilinear pairing operations respectively.

Probability analysis proof: ***C*** only fails in providing a consistent simulation because one of the following independent events happens:

- E1: ***A*** does not choose to be challenged on *ID**.
- E2: ***A*** makes key extraction query on challenged *ID**.
- E3: ***C*** aborts in a Signcryption query because of a collision on H_2 and H_3.
- E4: ***C*** rejects a valid ciphertext at some point.

We have $\Pr[\sim E_1] = \frac{1}{q_q}$ and $\sim E_1$ implies $\sim E_2$. Also $\Pr[\sim E_3]$ is:

$$(1-\frac{q_s}{q})^{q_s+q_2+q_3} \geq 1-\frac{q_s(q_s+q_2+q_3)}{q}$$

Considering $\Pr[\sim E_4] = \frac{q_u}{q_q}$, the overall successful probability $\Pr[\sim E_1 \wedge \sim E_3 \wedge \sim E_4]$ is at least equation 1.

The time complexity of the algorithm is dominated by the multiplication in the KeyGen, Signcryption and Unsigncryption queries and bilinear pairing in just Unsigncryption query which is equal to equation 2.

5.2. Unforgeability

The identity based aggregate signcryption scheme is $(\varepsilon, t, q_k, q_s, q_h)$-secure against EFU-IBAS-CMA2 adversary ***A*** under adaptive chosen identity and adaptive chosen ciphertext attack in the random oracle model if Elliptic Curve Discrete Logarithm Problem (EC-DLP) is hard in G_1.

Probability Analysis Proof: This is similar to the one in Theorem 1. In addition, there is a rewind here, with successful probability $\varepsilon = q_3$. Combine together, the overall successful probability is at least:

$$(1-\frac{q_s(q_s+q_2+q_3)}{q})(1-\frac{q_u}{q})(\frac{1}{q_3 q_1})\varepsilon^2$$

6. IMPLEMENTATION

In this section, an overview of the implementation in the single-hop setting is presented. This implementation is like [9] because the signcryption of our scheme is very similar.

6.1. Basic setting

In this simulation, the system parameter *Params* generated by the base station, is embedded in each sensor node when they are deployed. Like the case for general WSNs, the base station is powerful enough to perform computationally intensive cryptographic operations, unlike the sensor nodes, that have limited resources in terms of computation, memory and battery power.

The sensor nodes used are MicaZ 3, developed by Crossbow Technology. Its RF transceiver complies with IEEE 802.15.4/ZigBee, and the 8-bit microcontroller is Atmel ATmega128L, a major energy consumer. Also a PC (Dell Dimension 9150 3.0 GHz CPU, 1GB RAM)

is considered as a base station. The utilized programming languages are like [9]: nesC, C and Java. The base operating system for the MicaZ platform is TinyOS 2.0. In addition, elliptic curve cryptography due to the small key size and low computational overhead are employed. We specifically used an ECC library developed by Siemens AG 4 with 160-bit key size. we split the signcryption packets into two phases instead of single phase is that the "*K*" part of our signcryption will be the same for all signcryptions produced from a particular sensor node; hence it will save communication overhead by sending *K* once at the very beginning of the communications.

6.2. Energy Consumption Model

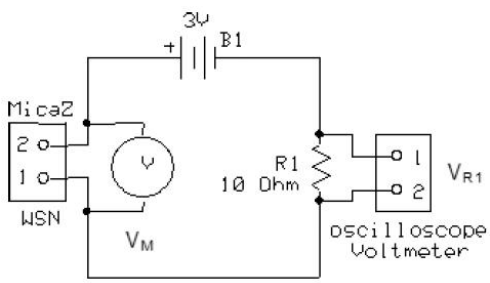

Figure 1: Power supply circuit for estimating energy consumption of MicaZ

Since the actual energy consumed when running our codes in MicaZ cannot be calculated just based on its internal impedance, there is no way to estimate the impedance of logic gates. Hence, the energy consumption of MicaZ is measured indirectly. Figure 1 shows the power supply built for estimating the energy consumption for our scheme. The circuit is powered by two Sanyo AA size NiMH rechargeable batteries, with fully charged and voltage level is at 2.97V. The reason that a resistor *R*1 is added to the circuit instead of just connected to an Ammeter in series of the circuit is because to capture the current changes in the circuit and the period of changes at the same time. With this setup, we are able to measure the current flow into MicaZ indirectly by measuring the voltage drop, *VR*1, in the resistor *R*1 using HP54520 oscilloscope. After we had the current information, we measure the total voltage drop across Micaz, *VM*, by using Fluke 87 voltmeter connected in parallel with MicaZ. By now, we are able to calculate the total power of the circuit in any instance. In order to get the energy consumption, we need the timing information. MicaZ is programmed to execute our scheme periodically. With this, the oscilloscope is able to capture the computation time as the voltage across *R*1 and *VR*1 will change across MicaZ during the computation of our scheme.

7. COMPARISON

In this section, we present the performance analysis of our scheme (IBAS) compared to the FssAgg schemes [10] (best known alternatives). In Table I, advantages and disadvantages of these schemes are presented. |σ|, |sk|, |pk| are bit length of signature/signcryption, private key and public key of given scheme, respectively. In tables II, 'S', 'V', 'AS', 'AU' mean Signing, Verifying, Aggregate Signcryption and Aggregate Unsigncryption respectively.

Our scheme is storage/bandwidth efficient and complements each other in terms of their storage overhead. Table II compares IBAS and FssAgg schemes about storage and communication overheads. Upon receiver opinion, IBAS, which require only single key storage, is the most storage efficient schemes. FssAgg and FssAgg-BLS (which is resourceful to address such UWMSN applications) schemes require linear and quadratic order storage respectively. Upon a sensor's perspective, all schemes require constant storage. Also aggregation property makes only a constant transmission overhead. Note that the aggregation also causes "all-or-nothing" property that provides the resilience against the truncation attacks [10]

TABLE I. COMPARISON OF IBAS AND FSSAGG

	IBAS	**FssAgg**			
		BLS	***AR***	***BM***	***MAC***
Data Confidentiality	✓	X	X	X	X
Public Verifiablity	✓	✓	✓	✓	X
Unbounded Time Period	✓	X	X	X	X
Forward-Secure Confidentiality	✓	X	X	X	X
Backward-Secure Confidentiality	✓	X	X	X	X
Flexible Delivery Schedule	✓	✓	✓	✓	✓
Signer Storage Efficient	✓	✓	✓	✓	X
Receiver Storage Efficient	✓	X	✓	✓	✓
Immediate Verification	✓	✓	✓	✓	✓

TABLE II. ORDER COMPARISON OF IBAS AND HASSAFS

	IBAS	FssAgg			
		BLS	***AR***	***BM***	***MAC***
S/AS	O(1)(|H|+|sk|+|pk|)	(Exp+H)l	(3x.Sqr+x/2Muln)l	(x.Sqr+x/2Muln)l	(3H)l
V/AU	O(1)|sk|	(PR+H)l	x(L+l)Sqr+(lx/2)Muln	L.Sqr+(2l+l.x)Muln |	(3H)l

8. CONCLUSION

We further studied the security issue in unattended wireless medical sensor networks with identity-based aggregate signcryption scheme. This proposed scheme is different with the scheme proposed by other techniques in WSNs [10, 11, 12, 13, 14]. Our scheme is proven secure with respect to its IND-CCA2 and EUF-CMA security formal and probability security. These are the strongest security notions for message confidentiality and authentication respectively. In addition, our scheme is efficient time and space order, i.e. both sender and receiver need least time and space overheads to

make secure system. In future works, we are supposed to improve our work by applying Homomorphic property. Applying this property, sensors are able to make secure connections through the network. In future, we are supposed to study other cryptographic hard problems to reduce linearly time order as well as equipped our scheme with some high applicable property called homographic. This property helps network to securely and efficiently transmit data.

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Offering the New Control Method for Performance Analysis Of Biomass System in the Smart Grids

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***Dr.Mortaza FARSADi*[2]**

Abstract

In this article we tried to control electrical loads in a small scales and a distributed generation with fuzzy logic controller. In this article the distributed generationis considered biomass power plant. The distributed generationis provides the power for electrical loads. In this simulation , the fuzzy system has the role of controling electrical loads connected to biomass power plant and when increasing electrical loads and biomass power plant not being able to provide the power, it separates the loads from the power plant and connects it to power network. The simulation in this paper was implemented on an IEEE standard 14 base load system and a fuzzy system operates between a small scale power plant and a throughout power network and controls the electrical loads .

Keyword : *biomass power plants ,smart grids ,fuzzy logic controller*

1. Introduction

Biogas is a kind of newly found energy in the area of sustainable energy. Environmental protection and the economic factor are two important factors here. This growing segment of this particular economy is nearly 5 % per year. Furthermore, private households demand almost 23 % of electrical energy of this source. Generally speaking, if this energy is used in the correct manner, the economy will grow and this energy industry will be able to be a part of climate protection. Nevertheless, additional income is obtained

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from energy production from renewable resources. Great investments are expected in agricultural and other industries leading to higher tax revenues. Several intermediates are originated during fermentation and the final product is biogas. It consists of roundabout 60% methane, 30% CO2 and residuum gases [1]. Smart grids are of those grids which are used to increase biomass power plants efficiency in the energy distribution cycle.

Smart grids are important topics in engineering research. The building block in the field is that mathematical analysis and "smart meters" could be used to induce users to reschedule their electricity use, thus creating a more efficient power grid [2]. Much existing work has been done on smart grids, including pricing [3], [4], integration of home production of electricity into the grid[5],[6], and dynamic load rescheduling [4].

A power grid involves physical components, which generate and transmit power, and cyber components, which transmit data and control signals. Currently, operation and control of bulk power generation and transmission network occurs at centralized control centers and relies mostly on operator in the loop control and analysis. For example, operators will review results from state estimation and contingency analysis and system operators make adjustments system operation accordingly. This control loop relies on human intervention and the time scale is on the order of minutes. In addition, some automatic wide area control, such as automatic generation control (AGC), has been implemented and relies on a slow response. More specifically, "AGC acts slowly and deliberately over less than a second or a few minutes [7].

These power plants have obvious effects in power generation so a precise controller is needed to control the power plant and its effects on the grid. Nowadays various controllers are used to control diverse kinds of power plant, which fuzzy controller is of the most important of the kind [8]. According to the position of these power plants in the field, different studies and simulations have done. For instance, operation of biogas power plants with a network of fuzzy nerves

was simulated [9], but there hasn't been any quantified study with a new controller and its effect on smart grids.

2. Biogas Power Plant

Every year, about hundreds of tons of biomass in various forms is produced in the world since it is a popular source of energy after coal, oil and natural gas. The most obvious benefit of biomass-based energy is its renewability and it is also environmental friendly. Worldwide biomass has the fourth rank as an energy resource, providing approximately 14% of the world's energy. It can be as high as 35% of the primar energy supply in developing countries like Bangladesh [10]. The country enjoys an electricity distribution of 42%. In the present era, a major section (81.43%) of the power generation capacity of the country is gas-based . As a result, Bangladesh is practicing a lack of power generation comparing with its demand, which causes load shedding [11] Agricultural biogas production has several environmental benefits. Electricity and heat can be produced from a renewable energy source. Standardized guide lines on the buildings and the operations of agricultural biogas plants guarantee a cost effective building and also save operation. Biomass has retained its position as a renewable energy source derived from plants that use solar energy during the process of photosynthesis. By being a source of renewable gas, biogas originates biomass through anaerobic digestion. In the past two decades, it has been adopted as one of the best alternatives for conventional fuels. Anaerobic digestion (AD) is a waste-to-energy technology biological process that produces biogas by bacteria under poor or no oxygen conditions. It is a colorless, flammable gas produced from a variety of substrates, such as animal manure, plant, human, energy crops, industrial and municipal wastes amongst others, to give mainly methane (5070%), carbon dioxide (20-40%) and traces of other gases such as nitrogen, hydrogen, ammonia, hydrogen sulphide, ater vapor etc. [12] It is smokeless, hygienic and more convenient to use than other solid fuels. The digesters are incubated at mesophilic (25–35) or thermophiles (45–60) conditions for a certain period of time. It is a multi-step biological process where the organic carbon is mainly converted to carbon

dioxide and methane. The process can be divide into several steps. hydrolysis/liquefaction, acid genesis, acetogenesis and methanogens. Fig. 1 shows the pathway for the mechanism of anaerobic digestion process.

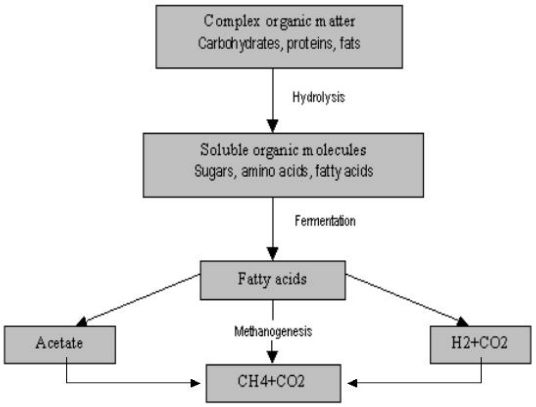

Fig.1. pathway for the mechanism of anaerobic digestion process.

Co-digestion of agricultural organic wastes is regulated. It also helps to enhance the implementation of biogas technology on farms, anaerobic digestion of farmyard manure as well. The aim of agricultural biogas production in any country is about 20% of farmyard and, 40% of cattle waste. Biogas has a wide variety of applications with many different purposes. In small scale installations, the gas is primarily utilized for heating and cooking (e.g., gas cookers/stoves) for and lighting (e.g., biogas lamps), and using as a potential fuel of a burning system for tea processing, fruit storing, hatching chickens, and household energy. In larger units, CHP's are fueled with biogas. In some cases, the driving force for utilizing gas is economizing fossil fuels or wood like in developing countries.

3. Smart Grids

3.1 Smart Grids

There's been several years that electrical infrastructure has remained unchanged. The components of the hierarchical grid approach their death-line. While the electrical grid has been ageing, the demand for electricity gradually increases. According to the U.S. Department of Energy report, the demand and consumption for electricity in the U.S. have increased annually by 2.5% over the last 20 years [13]. Today's electric power distribution network is very complex and inappropriate to the needs of the current century. There is a lack of automated analysis and poor visibility among the

deficiencies, mechanical switches causing slow response times, lack of situational awareness, etc. [14]. These have contributed to the blackouts happening over the past 40 years. Some additional inhibiting factors are the growing population and demand for energy, the global climate change, equipment failures, energy storage problems, the capacity limitations of electricity generation, one-way communication, decrease in fossil fuels, and resilience problems [15]. Also, the greenhouse gas emissions on Earth have been a significant threat that has caused by the electricity and transportation industries [16]. Consequently, a new grid infrastructure is urgently needed to address these challenges. Various emerging technologies within the transmission and distribution networks can contribute towards improving system operation and management [17]. The distribution system is very important because it used to be a passive network with less automated functions than the transmission system. In this vein, the fundamental objective of any smart grid implementation on the distribution system should enable all infrastructures to allow all desirable functions of optimizing the operation of the distribution system to achieve maximum benefits to utilities and end users alike[18],[19] .

These goals can only be obtained by a system that will enable accurate and regular monitoring of the distribution system. Lack of communication capabilities is the existing grid while a smart power grid infrastructure is full of enhanced sensing and advanced communication and computing abilities, as illustrated in Fig. 2. Different components of the system are linked together with communication paths and sensor nodes to provide interoperability between them, e.g., distribution, transmission and other substations, such as residential, commercial, and industrial sites.

Fig. 2. Smart grid architecture increases the capacity and flexibility of the network and provides advanced sensing and control through modern communications technologies.

Indeed, there are some energy-related advantageous from deploying the SGTs in the distribution network. Nonetheless, it requires further development of the SGTs and integrating them into the grid structure. This could allow the self-healing functionality of the grid and makes the integration of distributed generation (DG) technologies easier [20].

3.2 Smart Grids Simulated

Smart grid and its characteristics, which is used in this article, is the standard model of grid 14 bus bar IEEE. Figure 3 shows a smart grid 14 bus bar IEEE.

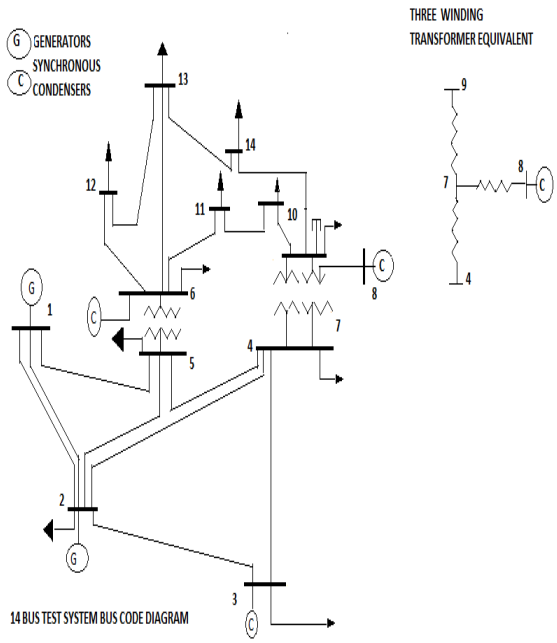

Fig.3. smart grid 14 bus bar IEEE

In this simulation 5 power plants connected to network and a distributed generation power plant were used with following generating capacitances :

- 1 power plant generating 615 MW scale
- 2 power plants generating 65 MW scale
- 1 power plant generating 25 MW scale
- 1 distributed generation power plant 25 MW scale.

In this simulation we connected considered loads to a DG power plant with 25 MW scale and these loads, from one side, are connected to a power network and from another side, to a distributed generating biomass power plant. Electrical loads are connected to power networks when are in peak amount and when distributed generation power plant has not the ability of providing needed electronic load. This biomass power plant can be established near agricultural farms or ranchering farms where we can find lots of animals garbages and agricultural wastages . Also in these places we can use Methan gas resulted from these wastages for generating power.

4. Fuzzy Controller Inference:

Fuzzy Inference Systems (FIS) have been applied comprehensively in the field of control, data classification, modeling problems and computer vision. FIS, using fuzzy logic, is the way of mapping a given input to an output. Fuzzy inference has two methods: indirect and direct. Direct method are the simplest and it categorizes in Mamdani type FIS [21] and Takagi and Sugeno FIS [22]. In 1975, Ibrahim Mamdani used fuzzy set theory and proposed the first control system using the theory. In this article, also used Mamdani kind of a fuzzy inference system in which P and Q capacitances are system entrances and a biomass power plant controlling and load's switching to throughout network, are system outlets. Figure 4 shows the fuzzy inference system, entrances and outlets.

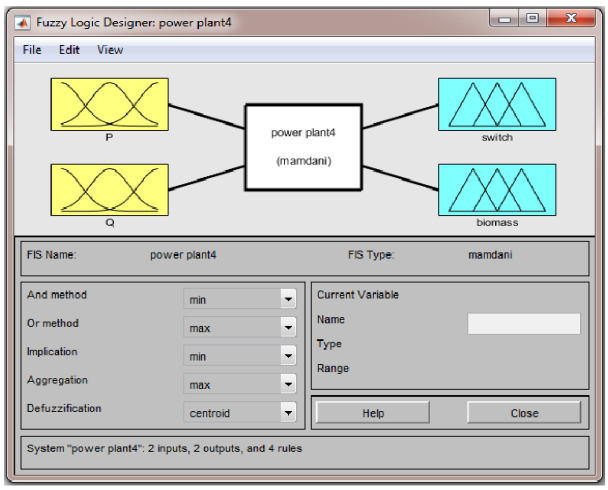

Figure 4. Mamdani's fuzzy inference set and its available inputs and outputs.

fuzzy system operating is in this way : it receives P and Q entrances and when increasing capacitances more than identified limits , the system switching the throughout network for the electrical load and lessen the biomass power plant production . took

the values of P and Q from the charactristics of IEEE 14 base load standard system .

In this simulation used two input's and two output's that figure's 5 to 8 shows the membership function's :

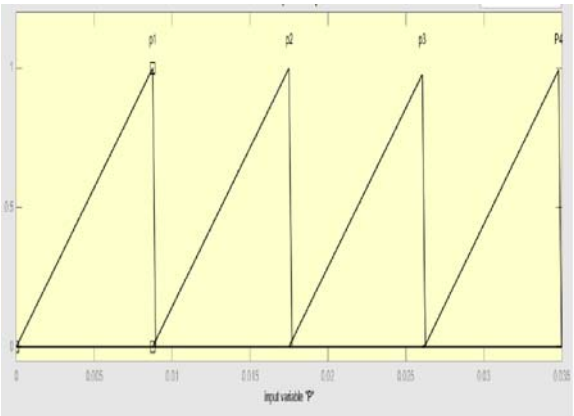

Figure 5. shows the membership function of input P

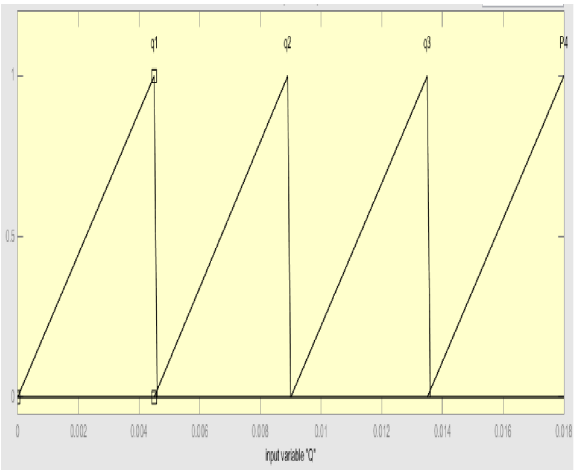

Figure 6. membership function of input Q

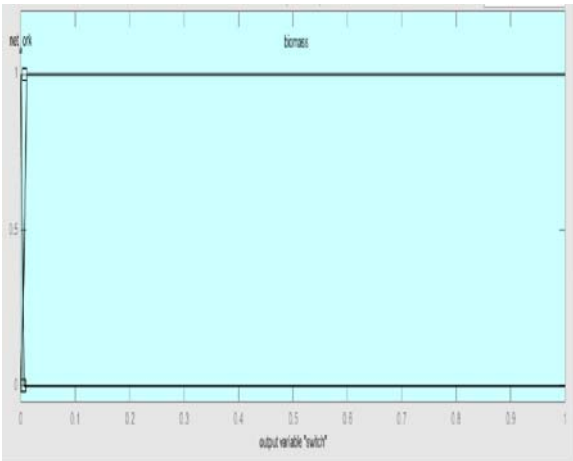

Figure7. membership function of switching output

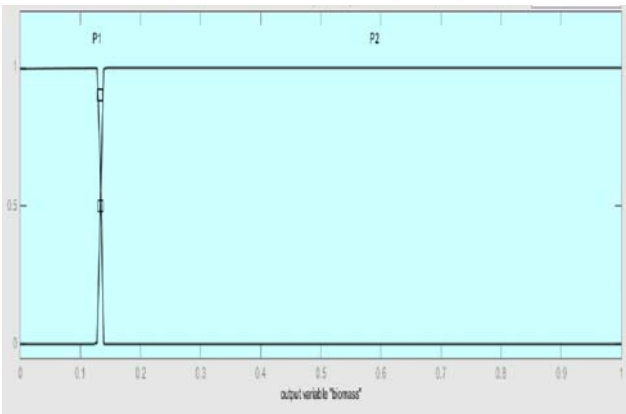

Figure 8. membership function of biomass power plant control output

5. Results

Figure 9 shows the diagram of biomass power plant operation that connected to power network. This diagram shows the

Overall power output behavior of power plant in 39 days. In this 39 days can be see that power plant about 5 times logged of circuit thoroughly and occurred the blackout that this status can be damages to power plant, network and will follow all of the client that connected to biomass power plant.[23]

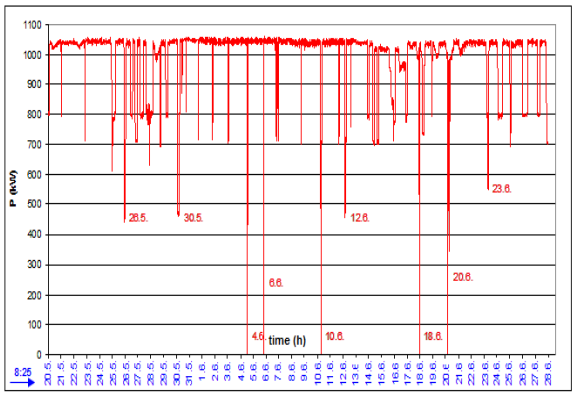

Figure 9. Overall power output behavior

In this simulation the fuzzy system so that designed that with increase the P and Q power's amounts of a specified range , reduce the biomass power plant production and in the same time contact the load's of other side to throughout network than be compensated the lack of electric power's and will reduce the biomass power plant production to minimum amount itself and until that do not come down the P and Q power's of the same desired limit the fuzzy system does not allow to increase the electrical production of biomass power plant. Figure 10 shows an overview of the implemented simulations and we can find out from it the controlling role of fuzzy system on biomass power plant and electronic load.

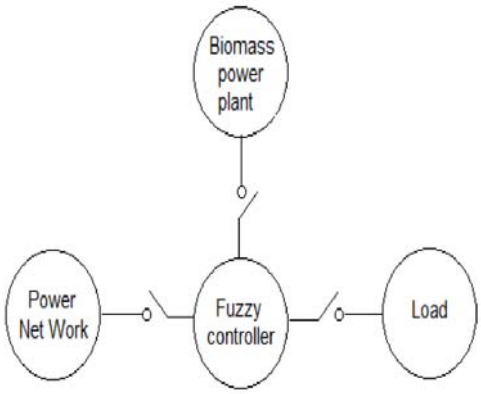

Figure 10. an overview of the implemented simulations .

Figure 11 shows the results of simulation for increasing P and Q capacitances which the fuzzy controller lessen the biomass power plant production and connects it to the power network.

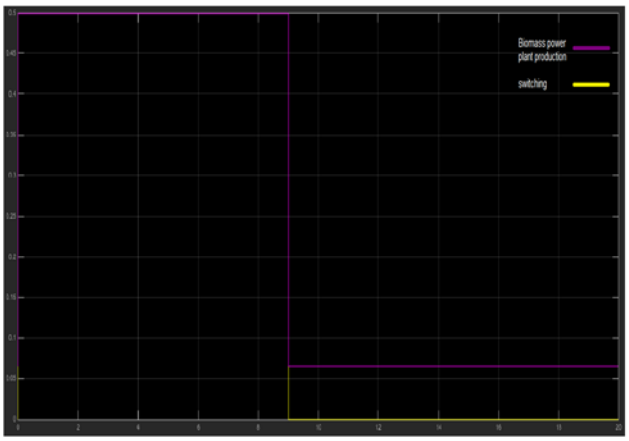

Figure 11. the operation of fuzzy system .

From figure 11 it can be found out that fuzzy system connected electrical load to power network in 9th second and reduces the biomass power plant production to minimum amount itself and after 9th second, the amount of capacitance generating of biomass power plant is decreased.

Figure 12 shows that with increasing electrical load, in the 9th second , fuzzy system operates and connects the load to the power network and we will see increasing power.

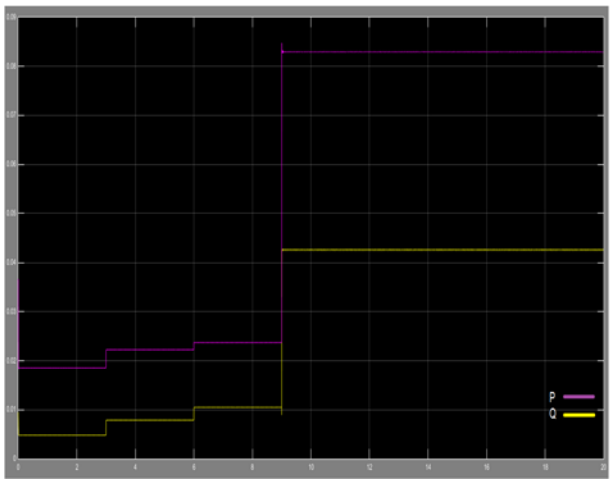

Figure 12. increasing electrical load in the 9th second

In this simulation increased load in 4 phases and in the last phase , we observe that load increasing is happened in 9th second and simultaneously, fuzzy system operates and connects electrical load to the power network.

7. Conclusion

In this simulation due to used of fuzzy system and control the biomass power plant and connected load's to biomass power plant with fuzzy system, during the sudden load's increase or decrease the fuzzy system will present the appropriate response to the same status of load's which makes removed the blackout situation, that this appropriate

response can be connect the electrical load's to power network or can be reduce or increase biomass power plant production.

Also whenever power electrical amounts increase of specified limits the fuzzy controller will reduce the biomass power plant production which makes removed the again switching status of power plant

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Effects of motivation and job satisfaction on the productivity

Seda Çelik TEKER [1]

Abstract

From enterprise point of view, motivation means the sum of the drivers in an organization, which lead the employees to start working and fulfilling their responsibilities within the company with desire. Job satisfaction can be defined as the positive mood of the employees as a result of their experiences gained during their work. With this article, we aim of to summarize the effects of the factors motivation and job satisfaction of the employees, which have significant effect on productivity. Additionally, through a research to the employees with different hierarchical managerial levels, it is examined how the expectation about these factors were and to which extend these have been realized.

Keywords: *Productivity, motivation, job satisfaction*

INTRODUCTION

There are several factors which have effect on the productivity of an enterprise. We can list the technological components of a company like machine, equipment, material, job determination which have technological inventions and structured elements, communication, decision making, status, role etc.

The company could have the best and modern machinery in order to reach significant levels of productivity. From location point of view, it could have been constructed in a very suitable location. The demand in the market among its products could be unexpectedly high.

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But although all these positive conditions are available, it could be the case that the company is not able to reach the targeted productivity level. Since all the components listed above cannot operate by them without a human factor and conduct productivity.

With the influence of the human factor in the company, the management issue became more complicated. The human is a complex entity who has volition and the behavior and reaction cannot be foreseen.

The members/employees of a company can increase or decrease with their own desire their productivity. That is why companies pay so much attention on motivation and job satisfaction since these are very important problems of the management.

The employees are not machines who operate when their power button is switched on. Therefore it is difficult duty for the managers to bring all these together where each of them has different feelings and ideas.

Each of the employees of a company has some desires and goals. Each individual shall think his desires and goals first and then it comes to the others desires and goals. With this respect, in order to reach integration for the company goals, the company should be able to respond the employees expectations.

One of the duties of a successful company management is to respond its employees expectations and lead them to company goals through increase the level of their job satisfaction. If the members of the company/employees are not eager to fulfill their responsibilities within the company, productivity and efficiency can not be reached.

With our research, what we want to achieve through motivation and job satisfaction elements is, to find the factors which could trigger the desire to work more efficient and reach the highest appetite level of the employees with their work.

Building a system aiming the effective levels of job satisfaction and motivation will support the productive completion level of the duties at the work place.

In our article we have discussed what the expectations of the employees are, for what reasons they are working; their reactions in case of their expectations are not fulfilled and

ways to fulfill employee's expectations in order lead them to the company goals.

1. What is job satisfaction?

During the working life of the employees at all levels, a series of experiences related to the business environment and business occurs. Certainly what they experience in this process will be what they faced, achieved and joy and sadness they had. They create an attitude towards their job or company as a result of what they know and sense. In this case it will be not wrong if we say that job satisfaction is the general structure of this attitude. Since the attitude of an employee will emerge in a positive or a negative way, job satisfaction in this context could be identified as "the positive mood of an employee as a result of work experience". No doubt, the negative attitude and approach to the work of the employees will create job dissatisfaction.

The employee is expecting to meet some specific needs and is waiting that the work and work environment appropriate to the personnel values. In other words, job satisfaction is the result of matching of the needs and values of the employee with the worth he is performing. As seen, job satisfaction has several definitions. However, in this study we will define job satisfaction as satisfaction or dissatisfaction of an employee from his work. Naturally job satisfaction occurs if the expectations of the employee and characteristics of the work match (Davis, 1998).

Among the major influences which lead to job satisfaction or dissatisfaction we can mention salary increase possibility, management style and general harmony of the work with the employee and relationships with colleagues. People engaged in a particular business could be pleased with some of the characteristics listed in business or not. Ultimately if the general attitude of the employee is positive, there will be job satisfaction, otherwise the discussion will be about dissatisfaction (Erdoğan, 1996).

There are three important aspects of job satisfaction. These are (Luthans, 1995):

a) Job satisfaction is a concept where emotional aspect is overriding since it cannot be seen and can only be felt.
b) Job satisfaction can be described as to which extend outputs meet expectations.
c) Job satisfaction, brings a lot of interrelated attitudes together. These are usually work, salary, promotion opportunities,

management style and relations with the collegues.

1.1. Attitude in terms of job satisfaction

Attitude is a concept that should be taken into consideration in a business environment. Depending on the attitude of the employees, behaviors can be important in terms of organization.

Attitude can also be defined as a continuous tendency of having special behavior and feelings against an object.

Attitude is a complex scientific process. It can be characterized in three ways. First, some things tend to be persistent unless you change them. Second, attitudes can match anywhere in an extended scale from much more preferred than no preference. Third, attitudes are shifted to some object about feelings and beliefs of the people. As mentioned earlier, the positive attitudes of people towards their work brings job satisfaction, if the attitude is negative it will cause job dissatisfaction.

1.2. Attitude components creating job satisfaction

Attitudes can be divided into three main components: Emotional, cognitive and behavioral. Emotional component covers the feeling of a person about an object - positive, neutral, negative and covers (Şimsek, 1995). Cognitive component consists of the information and beliefs of an individual about an objects. It does not make sense whether this information is experimentally real or true.

Behavioral component includes the tendency of the attitude of a person to an object. Only the behavioral component of the attitude components can be observed directly.

1.3. Importance of job satisfaction

Job satisfaction is a special kind of attitude. Information about the work and approaches related to the results of the work, conditions of work environment leads to form a series of attitudes towards his work. Job satisfaction is a special dimension of these attitudes.

Job satisfaction, in other words, positive attitude of the workers against their job results with some managerial and behavioral outcomes. Job satisfaction is one of the important factors of modern management. According to current management thinking and practice, a company's success does not only depend on variables like profitability, market share or taxes paid. It should be

measured after adding mainly the human dimension. First of all, job satisfaction is a social responsibility and moral necessity. Work is certainly a need for people. If an individual has to work or wants to work and spends a significant part of life in the workplace, so the employers should provide a rewarding work place or at least without troubles.

In most of the studies, it is observed that there is a close relationship between the mental and physical health of employees and job satisfaction. However, it is impossible to determine the direction of this causal relationship. It is clear that job satisfaction has some important consequences for both business and employees side. For the companies which are able to provide job satisfaction to the employees, it is not difficult to find new employees and create loyalty to the company. Just the opposite, for the organizations that cannot provide job satisfaction, it is difficult to find new employees and it could also cause negative union work. High levels of job satisfaction will contribute to employee happiness and decrease in job satisfaction will cause alienation into the business and accordingly apathy and disharmony. In addition, if there are some researches that stand up for the idea that with increase of education levels the business expectations also increases and if enterprises do not respond to these, job dissatisfaction would be the source of major problems in the future (Erdogan, 1996).

2. What is motivation?

To understand the behavior of individuals and impress them, we need to know their requirements. Requirements are the key to human behavior. By the creation of human behavior theories, the gravity is by examination of human needs. In order to understand the behavior of individuals, we need to know the requirements that lead them to this behavior.

The factors which lead the individuals to certain behaviors, impulse behavior, can be defined as motivation (Yalcin, 1988). In general sense, motivation is the force mobilizing individuals and providing a driving force to continue the initiated acts. In other words, motivation is actions of the individual with their desire and willingness to accomplish a specific purpose (Koçel, 1995).

Motivation, when examined in terms of organization, is all the power that enables the

members of organization to start working and fulfill the requirements of their work with good mood.

When there is a lack of something by the individual, a chain of cases will start. One will conduct, however, this behavior is any behavior. The organism, having a lack, will make a behavior toward a goal. To achieve the goal will satisfy the need. So motivation mechanism will be completed as follows (Dereli, 1981).

Requirements -------→ Behavior ------→ Goal

To understand human behavior and influence them we have to know their needs. Needs are the key is to understand human behavior. To understand human behavior, we need to investigate "impulse behavior" (motivation) which leads them to this behavior (Yalcin, 1988).

In an organization motivation brings move and vitality. In companies, the behavior of all people relies on a reason. Individuals are doing a job to satisfy their needs and desires. They try to find the most suitable job that satisfies their needs according to them (Baykal, 1982). Why do people behave in certain ways? Why a manager leaves his office as soon as the official working time is finished, where another prefers even to work extra a few hours? Why some like to work alone with documents and figures for long hours, where the other cannot work regularly in his office and prefers to have a job with more contact with others? Even though some managers confirm every word of his chef, where some of them do not hesitate to criticize if necessary.
In response to all these questions we can state that everyone has its own unique personality. This difference shows us that the degree of satisfaction and motivation from certain and common needs of employees may differ (Dereli, 1981).

Individuals should get encouraged and tempted to work together. Because attitudes and behavior depend on the cause, motivation is a factor which is necessary for forming the start of this attitude. Motivation is a tool that managers use to conduct their employees towards the company objectives and to awake wish and desire to work. Although a company has high quality machines, instruments, apparatus, equipment, it will not help to ensure productivity unless people are not motivated to operate these (Baykal, 1982).

A company is a complete system which aims to achieve specific goals with the physical and human opportunities. For this purpose, work to be done is planned, organized and the ways to reach the goal is determined. Employees within an enterprise are expected to work in order to achieve those objectives. The details of targets, business policy, processes, job descriptions, recruitment and training should be determined in order to fulfill the planned and organized efforts. Mindset of people working in an organization is not limited to only work responsibilities and way of performing them. Employees are tend for the conduct of their cultural and social structure. Employees also want to saturate some of the social and cultural needs in addition to responsibilities for specific business tasks. To treat employees as people who apply specific instructions would be a missing opinion. Knowledge about variety of employee needs may establish balanced relations at certain points of business goals and the needs of people. Being engaged for achieving the goal of the company; cooperation and coordination of all employees has important role. Such a working environment can be established on the one hand trying to reach the planned destination of the company on the other hand considering the needs of the employees and provided them within possibilities (Senatalar, 1978).

2.1. Motivation theories in terms of job satisfaction

The initial motivation theory could take until 1910. Frederick W. Taylor's "Scientific Management" approach has also considered the incentive fee. Human relations approach has provided few to understanding of the basic elements of motivation, but did not take in to consideration that different individuals can be motivated by different things.

To review and discuss all of the motivation theories approach would exceed our goal. Therefore, we suffice to give the names of important theories of motivation. These are (Simsek, 1995);

- Maslow's hierarchy of needs
- Dual-factor theory of Herzberg
- Alderfer's ERG theory
- Expectations theory
- Equity theory
- Porter-Lawler model

3. Research

In order to investigate the impact of job satisfaction and motivation on productivity, what we have studied theoretically above, we have performed a practice study. This practice has been carried out in the pharmaceutical company Aventis.

Hoechst, the mother company before merger to Aventis, was established in 1863 by two chemists and two traders in Germany. 142 years later, today, Aventis is represented in more than 120 countries and in 64 of them with production activities.

Main activities, till end of 1995, were pharmaceuticals, agricultural chemicals, synthetic fibers and yarn production, textile dyes and auxiliaries, paint industry chemicals, synthetic resins, plastics, pigments and master batch production, food additives, cosmetics, production of electrodes used in communication technology and steel industry. Later the company limited the activities by bordering pharmaceuticals, agricultural chemicals, synthetic resins, textile chemicals and food additives. In order to strengthen itself in the pharmaceutical industry, the company bought America's most powerful marketing company Marion Merrell Dow and bought a French pharmaceutical company Roussel. December 1 1998, company name was changed to Hoechst Marion Roussel. In 1999, through the merger with France's leading pharmaceutical and prestigious drugs (cancer drugs, vaccines and serums) company Rhone Poulenc, the company continued its operations with the name Aventis.

3.1. Research methodology

In the selected company, the following survey about role of job satisfaction and motivation on productivity is performed with the method face-to-face.

Surveys were administered to a group selected from a sufficient number of people working in management and expert staff in the company. The expected impact on the motivation and job satisfaction of the issues in question should be answered as "very, quite, few" by the respondents. Besides, the realization of the effect on increasing/decreasing productivity is also tried to measure with scale "very, quite and few”.

The questionnaire was evaluated by each question. Accordingly, the resulting situation

is shown below in two separate tables for managers and experts.

If we take as an example the first question, the questionnaire was evaluated as follows. The answers to the question "What kind of an impact has meeting in luxury places on job satisfaction and motivation?" were both for managers and experts resulted as little impact. According to the results from the managers, 80% expect that meeting in luxury places has little effect on productivity, while the expectation of 20% is "quite". The rate in terms of realization is, for 60% of managers "few" and 40% "quite”.

Referring to experts the situation is not much different. In such a case, the expectation levels are 7% "very", despite 33% "quite" and 60% "few" is. When looking at the realization rate, for 7%, it is "quite" and for 93% "few".

Applying this method fifty (50) questions were analyzed and the following tables were obtained.

Dear Participant

We kindly ask you to evaluate the below given cases on generating or not, job satisfaction and motivation also effects of these on productivity.

Please give in the first part your level of expectation about the case described and then realization level of the case in your recent work life.

Thanks in advance for your inputs

		Expectation			Realization		
	EXPERTS	Very	Quite	Few	Very	Quite	Few
1	What kind of an impact has meeting in luxury places on job satisfaction and motivation?	7	33	60		7	93
2	Does having the responsibility of taking any risks motivate you?	13	74	13		47	53
3	What do you think about that your opinion is taken before decisions?	53	47		6	47	47
4	Is a work place where career opportunities can be achieved with performance motivating?	73	20	7		47	53
5	Does it motivates you, that your effort and outputs are followed carefully?	73	27			47	53
6	Will your job satisfaction increase with having initiative, responsibility and authority?	47	53		7	60	33
7	How will the intention to training effect you?	53	47			27	73
8	Does it motivates you having a lot vacation days?	13	67	20	14	53	33
9	Does working hours effect the interest towards the work?	60	40		27	60	13
10	What is your opinion about the motivational efforts in your company?	80	20		7	20	73
11	Do you expect a positive social environment at work?	53	47			47	53
12	Do you expect a positive physical environment at work?	47	47	6	14	33	53
13	Is being a part of a company which trusts its employees important?	60	40		6	27	67
14	Is being a part of a company important?	47	47	6	7	53	40
15	Is being appreciated with the effort important?	67	33		6	27	67
16	Is it important that there are some promotinal possibilities available?	60	40			20	80
17	Is it important working in a sincere atmosphere?	40	60		14	53	33
18	Is having social possibilities motivating?	47	53				100
19	Is it motivating having good relations with the colleagues?	40	60		40	47	13
20	Is it important being respected in the work enviranment?	53	47		7	86	7
21	Is it important that the company pays attention to the employees?	60	40			60	40
22	Is it motivating having the possibility to use vacation days?	27	67	6		67	33
23	Is it important working in an enviranment where you can use and increase your capabilities?	60	40			47	53
24	Is it motivating to be in a competitive workplace?	20	67	13		67	33
25	Is it important to have international business contacts?	53	40	7	14	33	53
26	Does it create job satisfaction having technological capabilities by business?	60	40		13	54	33
27	Does it ensure motivation having self-development opportunities?	67	33		7	40	53
28	Is it important being in an active, enjoyable and changing business environment?	67	33		13	20	67
29	Does recognation of the opportunity to make a career matter?	60	33	7	13	20	67
30	Working in an institution open to innovation important?		60	40		33	67
31	Is it motivating having permission using vacations when needed?	47	53		20	60	20
32	Is a high salary important?	53	47			33	67
33	Is bonuses important?	40	60			73	27
34	Does it motivate you to have the social security rights?	40	60			53	47
35	Does it support the motivation to be in a peaceful work environment?	60	40		7	73	20
36	Is job security motivating?	60	40		13	60	27
37	Is having an environment where employees explain their ideas freely important?	80	20		13	40	47
38	What is your opinion on granting the efforts completely?	67	27	6		33	67
39	What is your opinion facing not harmful critism about work-related issues?	60	40			53	47
40	Is it important for employees helping themselves?	20	60	20	14	73	13
41	Does the fact business trip create job satisfaction?	27	53	20	7	20	73
42	Is it important to do a job that matches the personality of the employee?	60	40		7	53	40
43	What is your opinion on the non-restriction of the freedom of workers at work?	60	40		6	47	47
44	Is the careful selection of elements at work important?	73	27			47	53
45	Is it important to work with a fair promotion system?	67	33			53	47
46	Is it important having equality in the workplace?	60	33	7	6	47	47
47	The lack of clarity in the workplace important?	67	33			27	73
48	What is your opinion about ensuring job satisfaction?	53	47		6	27	67
49	Is it important to work with a good manager?	60	40		20	40	40
50	What is your expectation about having a relaxed atmosphere on manager-employee relations?	47	53		13	60	27

Conclusions and Recommendations

The situation of human factors changed significantly across other production factors, especially technological tools. Once upon a time, people were perceived as a simple production input and perception was that he has to do the job given to him. In business today, taking over economic and financial aspects and neglect social and psychological aspects has become an outdated way of thinking. Today, employees in environments that meet their physical and spiritual needs and let them work in peace and with willing, play an important role in the success of the businesses. Therefore research studies are performed, considering the employees' expectations, how to motivate and force employees to work with good morale. Since employees performance or business accomplishment depends on motivation and job satisfaction factor with effects his ability and increase of enthusiasm.

Since human behavior, feelings, tastes, providing satisfaction impacts the efficiency of the business, managers grasped the importance of psychological factor and consideration of psychological factors to ultimately the success of the company has become a necessity. Indeed, using the tools effectively to motivate employees and improve job satisfaction increases efficiency in business. An effective motivation system enables to eliminate alienation, disgust, being angry, sulk, apathy and aggressive behaviors. Low morale in terms of business manifests itself with the resistance of workers, industrial conflict, strike, absences and increase in accidents. Providing high morale enables employees' engagement and business-employee integration.

Each type of regular economic effort in labor costs constitutes a significant portion of the total cost. Keep it to a minimum level does not mean with lower wages, instead careful use of energy from adequate paid employees and so ensuring an eager and effective operation in the right direction. It has been proved that even paying higher than the current situation labor costs can be lower.

The managers who assess employees complete physically, intellectually and emotionally structures should get acquainted with the work objectives of employees first and then they get the chance to evaluate the behavior in order to acquire useful employees for the businesses.

In the history, some business owners and managers forgot the reality that the purpose of production is serving human goals and had fallen into the mistake of seeing production as the goal itself. However, the important facts we need to know is that people are not created for working in the companies, but the company is that created by the people and for the people. If companies businesses policy is “win people” instead "make money" that will bring long-term success.

The physical presence of a human, labor and time can be purchased, but his creativity, initiative, loyalty, physically, intellectually and spiritually dedication to the organization cannot be bought with money. These can be obtained with existence of good motivation in the organization and implementation of it. The most effective way to manage it in terms of achieving a balance between business-employee sides is to know the companies goal as well as to know the purpose of their employees. For this reason, first, the motives of the employees to work and the requirements which they originate should be examined and then achieve some certain findings. No matter what the hierarchy of the employee is, if managers want to increase the performance of employees and bring their employees efforts into line with the business objectives, if they want to bring it into line with the business objectives; they must pay necessary attention to motivation. For that reason, company should consider the changes in the characteristics of human nature and in each single change, relationship between employees should be examined.

In companies, an effective motivation system that enables both employees themselves and the business should be established. By this situation the major responsibility is by the owner of the company and the managers. These responsible should improve enhancing management policies and create measures for that. With these improvements, the human element among other factors can reach the most important level.

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*Semantic Role Labeling With Relative Clauses**

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Abstract

One of the main goals of computerized linguistic studies is automatically finding the elements of a sentence. Separation of sentences with too many judgements into their elements is a more complicated process when compared with simple sentences. In this study, instead of separating the whole sentence into its elements, the separation of sub clauses into their own elements is suggested. This approach can be considered as dividing a hard problem into sub parts; and this had higher rate of achievement when compared with dividing the whole sentence into its elements. Condition Random Fields (CRF) algorithm was used for dividing the sentences automatically into sub-clauses and finding its elements.

Keywords: Natural Language Processing, Semantic Role Labeling, Condition Random Fields

1. Introduction

In the studies about natural language processing, division of sentences into their components automatically is necessary for many applications. Dividing a sentence automatically into its components makes it possible for various natural language processing problems such as information inference, dialogue systems, text classification and text understanding.

Sentence is a syntax that indicates a feeling, a thought, a request and a judgement. One or more judgements might exist in a syntax. When we examine the sentences in terms of

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structure, we see that they are separated into 4 groups [1].

Sentences with a single judgement are called simple sentences, and sentences with more than one judgements are called compound sentence. But one these judgements is the main sentence, and other(s) are the sub-clauses that define the side sentences. If there are more than one sentences in an expression which are connected to each other in terms of meaning, this sentence is called tiered sentence. Sentences inside a tiered sentence are connected to each other with a comma or semicolon. Bound sentence is connected by conjunctions. Examples about these 4 groups are below.

"You have to study hard." and "Everyone should love trees." Simple Sentence
"No one liked (Main sentence) / the game we watched together yesterday (sub-clause)" Compound Sentence
"It snows outside, weather must be cold." Tiered Sentence
"You are old whenever you are get used to your environment." Bound Sentence

There are studies in the literature conducted in order to find the elements of Turkish sentences automatically. In the study conducted by Özkose and Amasyali, the elements of simple (without verbal) Turkish sentences were found and life science inference was made for element pairs [2]. Manually generated rule based method was used to find the elements. Another study conducted by Coşkun has also used a manually prepared rule based structure [3].

Aygül et. al. have used the CRF to find the elements of Turkish simple sentences and they have used CRF on a Turkish data set consisting of 2000 simple sentences; dividing the sentence into its elements [4].

Study conducted by Zafer has developed an analyser relying on grammatical rules independent from the context, morphological analysis and validity rules. Developed system works for all Turkic languages with independent grammatical rules that include validity rules. The study was made for Turkish and for Turkoman [5].

Simple sentences and manually established rule sets were used in the studies. But, the texts faced in daily life are mostly in the form of compound sentences.

Except for these studies, although there are many examples for English [6], there is no other study using CFR in order to find the Turkish sentence elements. There are some studies that use CRF for Turkish Name Entity Recognition. One of them is a study conducted by Şeker and Eryiğit [7] on the texts of news. Another study was conducted by Özkaya and Diri {8] and it is on the e-mail texts. In both studies, 3-4 different entity name types (name of individual, name of places, name of institution etc.) and the success rate was around 90 %. The Dependency Parsing study conducted by Singla et.al. for the Indian language is about the determination of a word other words are dependent in a sentence and the dependency labels [9].

This study focuses on dividing the non-trivial sentences (compound, bound and tiered) into their elements. Different from the existing literature, instead of dividing the non-trivial sentences into their elements; it was suggested to divide them into sub-clauses first and then into the elements. This is an approach that could also be seen as dividing a complex problem into its simple sub-divisions. Instead of manually creating the rules of dividing into elements, CRF was used. The second part of this paper gives information about Condition Random Fields. Third part gives information about the used data set. Fourth part gives information about the experiments conducted. Fifth part interprets the obtained results.

2. Conditional Random Fields

CRF proposed by Lafferty et al is a method of sequencing a machine learning based on the statistical classification [10]. Array classifiers tried to throw a label to each unit in an array. They calculate a probability distribution on the possible tags and they select the best possible label combination. Accordingly CRF model can be defined as a probability model was developed to calculate the p(o*|s*) probability. Here while specifying the o* $=o_1,...,o_n$ possible outcomes tags, it specifies the s*$=s_1,...,s_n$ input data.

It is a frequently used method in the problems such as CRF, NER, POS labelling, SP and so on. Formula for CRF is given in Equation 1 and its form in Figure 1.

$$P(s|o) = \frac{1}{Z_{(\vec{o})}} \prod_{t=1}^{(\vec{o})} \exp\left(\sum_j \alpha_j f_j\,(s_t, s_{t-1}) + \sum_k \beta_k g_k\,(s_t, o_t)\right) \quad (1)$$

$Z_{(\vec{o})}$ is a normalization factor for all possible label sequences.

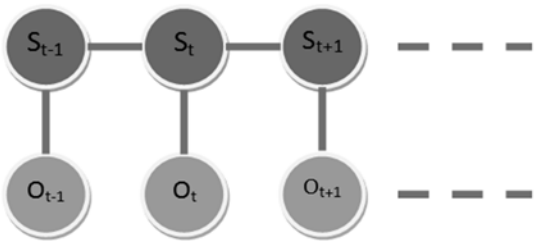

Figure 1 Condition Random Fields [3] (S-State, O-Observe)

Quality functions are determined for each word in the training corpus. In the training set quality functions, also label information in the designated word is available. According to this benefiting quality functions and action sequences of the specified word weight value of each attribute is calculated. Some attributes may be high weight to throw that word that label type, some qualifications may lower the weight to assign a label. Thanks to educate the system a CRF model which you can find weight values for each feature is created. CRF model created through training is can be used to label previously unlabelled words. After determining the nature of each word, thanks to the CRF model became apparent that the weight of each character, the calculated probability of each word is assigned to each label [11].

As a result, if we consider the most likely label combination as Y*. Each word sequence (o) can be found as given in equation 2 by selecting the most likely.

$$Y^* = \arg\max(P(s|o)) \quad (2)$$

3. Used Data Set

1278 non-trivial sentences were gathered from various news sites and novels in order to compare the two approaches of dividing a sentence into its elements as a whole and then dividing the sentence into sub-clauses and then into its elements. In order to measure the success of first approach, we need sentences divided into their elements. And for the second approach, we need sub-clauses and the divided sub-clauses.

By using the FatihParser program [11] in the study which operates with Zemberek Natural Language Process library; the analysis of the words were done. FatihParser is a syntax analyser designed for Turkish and other Turkic languages. Table 1 indicates the word analyses in the sample sentences.

Table 1. Keyword analysis is made example sentences

"yazar/isim" "da/2conj" "ısrar/isim" "et/verb mek/+fiil_mastar_mek ten/isim_çıkma" "vazgeç/fiil er/fiil_genişzaman_ır"
"canan/Özel_isim" "kadın/Özel_isim" "ağla/fiil mak/+fiil_mastar_mek tan/isim_çıkma" "perişan/sıfat" "hale/isim" "gelir/isim"
"heyecan/isim ımız/isim_sahiplik_biz_imiz" "git/fiil erek/+fiil_süreklilik_erek" "art/fiil ıyor/fiil_şimdikizaman_iyor"
"böylece/isim" "çok/adv" "çalış/fiil an/+fiil_dönüşüm_en ın/isim_tamlama-ın" "yüksek/sıfat" "emekli/isim" "maaş/isim ı/isim_belirtme" "alacak/isim"
"doğru/sıfat yu/isim_belirtme" "söyle/fiil yin/fiil_emşr_siz_in" "yan/isim ınız/isim_sahiplik_siz_iniz da/isim_kalma yım/fiil_kişi_ben_im"

4. Experimental Results

The data cluster suggested in the previous chapter were used in trials. The results present the work conducted for dividing the sentences into sub-clauses automatically, followed by studies dividing them into their elements. For the Training and Test phase of the studies; CRFSHARP program written by CRF based C# language was used [12].

4.1. Determination of Sub-Clauses via CRF

1278 sentences were installed into the system, providing automated labelling. Through the developed program, sentences were labelled automatically and were transformed into a format for CRF system. The definitions of the terms used in labelling are indicated on Table 2. Some examples of the sentences that were automatically labelled and transformed for CRF system can be seen in Table 3.

Table 2. Labeling Definitions

Label	Description
Start	Dependent/Basic clause mentions start
Continue	Dependent/Basic clause mentions continue
Finished	Dependent/Basic clause mentions finish
Empty	Mention the blanks in the sentence
Punctuation	Mention punctuation marks

Table 3. Example of Automatically Labelled

Example Clauses		
Introduction 1	**Introduction 2**	**Exit**
kaymakam	isim	Start
ın	isim_tamlama-ın	Continue
bos	bos	Empty
karı	isim	Continue
sı	isim_sahiplik_o_ı	Continue
bos	bos	Empty
ol	verb	Continue
an	+fiil_dönüşüm_en	Continue
bos	bos	Empty
canan	Özel_isim	Continue
ın	isim_tamlama-ın	Continue
bos	bos	Empty
yusuf	Özel_isim	Continue
u	isim_belirtme	Continue
bos	bos	Empty
aşağıla	fiil	Continue
ma	fiil_dönüşüm_me	Continue
sı	isim_sahiplik_o_ı	Continue
bos	bos	Empty
bile	fiil	Finished
o	pron	Start
nu	acc	Continue
bos	Bos	Empty
etki	Fiil	Continue
le	fiil_olumsuz_me	Continue
mez	fiil_geniszaman_ır	Continue
.	Nokta	Finished

Out of 1278 sentences we have; 250 were used for test and 1028 were kept for training. The number of sentences for the experiment of dividing the sentences automatically into main and sub-clauses and the success rates on test cluster are seen on Table 4.

Table 4. Training Set Success Rate

Training Set Clause	Exit Function	Test Success Rate
100	21025	98.49
250	37355	98.46
500	59015	99.3
1028	104080	99.59

As it can be seen on Table 4, the automated determination of sub-clauses was actualized with a very high success rate. Also, it can be seen that the increase of number of sentences in training cluster has made a positive effect on success.

4.2. **Impact of Dividing the Sub-Clusters into Its Elements**

As the division of sentences into sub-clauses was achieved on Chapter 4.1.; it was seen that the idea of using the sub-clause divided version of a sentence instead of dividing the whole sentence into its elements was an applicable idea. 2 different systems were prepared in order to compare the division of sentences as a whole and dividing the sub-clauses into its elements. First system divides the sentence into its elements as a whole; and he second system divides the sentence into its sub-clauses first and then divides the sub-clauses into their elements. Randomly selected 1000 sentences from the 2000 sentence data set created by Aygül et.al were used for the training of both systems [4]. And for the test, 100 compound sentences created in our study were randomly selected and used. At the training and test of first system, sentences are inserted into the system as a whole. Same education set is used for the training of second system. And for the test set; 100 compound sentences becoming a new sentence for each sub-clause was developed. So, a test set consisting of 225 sentences was created in our test set. Labels used for labelling the sentences are indicated on Table 5. Also, single test set sentences provided as a whole and divided into sub-clauses are seen on Table 6.

Table 5. Used Labels

Label	Definition
o	Subject
bn	Direct Object
bsn	Indirect Object
dt	Indirect Component
zt	Adverb
y	predicate
Punctuati	Punctuation marks (.-, etc.)

Table 6. Example of Labeling

With Dependent Clause			
People	half	naked	walk
o	zt	zt	y
meal	Do not find		
bsn	y		
situation	come		
bsn	y		

Compound Clause								
İnsanlar	yarı	çıplak	dolaşıp	yemek	bulamayacak	hale	gelirler	.
o	zt	zt	y	bsn	y	bsn	y	Punctuation

Table 7 indicates a sample training set sentence.

Table 7. Example of Train Sentence

Introduction 1	Introduction 2	Exit
bugün	Zaman	zt
ler	İsim_çoğul_eki_ler	zt
de	İsim_kalma	zt
hava	İsim	o
lar	İsim_çoğul_eki_ler	o
çok	zarf	zt
sıcak	Sıfat	y
.	Nokta	Punctuation

The window dimension for CFR training was set as 3. In other words, when the probability rate is calculated for the word "air" (hava); previous word "de", previous type definer "isim_kalma"i next word "lar" and next type definer "isim_cogul_eki_ler" is taken into account and a probability model covering all of these is created.

The flow chart diagram about the study conducted is seen at Figure 2.

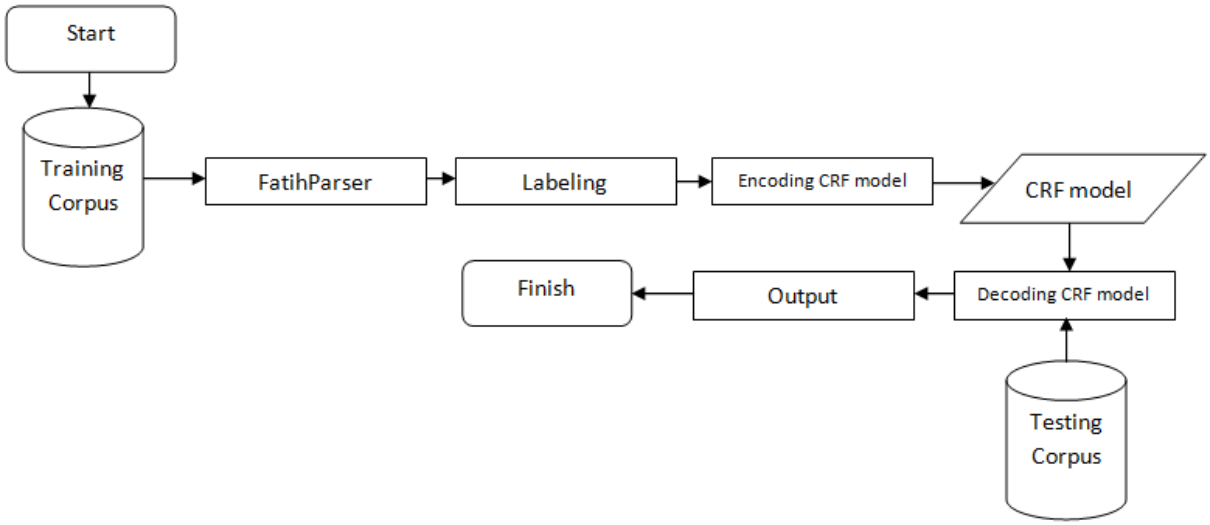

Figure 2 Flow Chart Diagram for application

The results of the experiment of dividing the sub-clauses into elements are seen on Table 8.

Table 8. Results

Test Set	Accuracy (%)
Compound Sentence (Test	43.91
Dependent Clause (Test	59.58

As Table 8 indicates, as the sentences are divided into sub-clauses; system had a higher rate of success in terms of dividing into elements.

4. Conclusion and Discussion

Dividing the sentences into their elements is an important issue for linguistics. We have conducted two studies in order to do this automatically.

As a result of the first study, it has been proved that CFR algorithm which is frequently preferred for sequence labelling transactions is also applicable in Dividing the Sentence into Its Elements. It was seen that the CRF system trained by manually labelled data had a great success rate in dividing the sentence into main and sub-clauses. The experiment has proved that there is a direct proportion

between the size of training set and the increase of success.

Second study has reached the conclusion that instead of giving the sentences as a whole, dividing them into main and sub-clauses significantly increase the success. When the sequence labelling is done, it is proved that each sub-clause has a unique consistency and dependency. The thesis that sub-clauses can be used in order to increase the success of a system trained by simple sentences on a test set with compound sentences is hereby proved.

The training set of the system is not yet in the size of expressing Turkish. Along with this, as the amount of labelled data increases; it is assumed that the reliability and success of the system will also increase. As a defect of the system, it was not found how the sub-clauses are bound to the main clause with a label. Forthcoming studies are planned in order to overcome such deficiencies.

To access the data sets used in this study, an e-mail request can be sent to metin_bilgin@hotmail.com

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Investigated Solution of Urban Problems in Turkey: Example of Fikirtepe Urban Transformation Project

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SUMMARY

This study shows a sample of shanty houses from Turkey and gives details about most famous squatting area. This study also provides insight about Fikirtepe, about its total area, most important problems as a squatting area, and actions on target and solution alternatives to be offered. The Main objective of this article is to browse the existing problems of Fikirtepe to understand the basic problems of slums in Turkey. All informations were gathered from authorized and reliable persons at state institutions. Fikirtepe area was visited and all projects were observed closely to evaluate gathered information. Squatting fact was started at very early years as other big cities of Turkey and stepped up after industrial revolution. Due to location of Fikirtepe, it has been one of the best places to settle for many migrants and this caused high increase of population. As a result, all insufficient services became useless. On the other hand, all illegal shanty houses, which were built without any plan, were threaten for local people. Especially the fault line that takes place under the area increases the level of threat significantly. Based on these facts, transforming Fikirtepe to a modern neighborhood with earthquake resistant buildings was carried into effect by authorized corporations. Major problem at neighborhood is wrong usage of land. Subject problem created domestic migration movement. Most probably, the wrong usage of land is the main reason for illegal settlement of migrants to area by ignoring range basic services. It causes lack of services.

Keywords: *urban, urban transformation, slums*

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INTRODUCTION

After Industrial Revolution, The world has lived arising and progressing in whole branch. Requirement of work that depends increasing of population, eating, drinking, different materials of welfare and the most important thing is irrespective of socioeconomic status and people needs like appropriate shelter has occurred increasing. The most important factor is migration that done with purpose of education, work and looking for comfort in lots of society especially countries which has developed in its Urban Revolution. Then, Young population of rural areas wants to open up to the outer world and have better education and work opportunities.

In brief, this is searching progress of future and first step has done in big cities. Most of people migrates the big cities because of economic factors.

The people prefers living in socioeconomic districts that are poor and secondary. The reason of this low rent prices and lower expense as regards rich districts but this population density that wasn't made with the modern and planned basis creates a big responsibility on poor infrastructure. The main reason of reduces quality of life and complicate the urban life is quick and unplanned urbanization. It causes inadeguating of request of work and housing, squatters, irresponsible forms of consumption of the natural disasters and by this way some issue has been occurring like hazarding the dangerous of people life, traffic problems, increasing of crime rate and increasing the social imbalances ever. An estimated, more than half of the people are living in big cities and each of every three city dwellers lives in poor districts of cities.

Figures by language in 2010-2011, according to '' State of the World's Cities'' reports that written by the United Nations, in 1990-2010, the rate of people who live in poor areas of big cities in developed regions is % 32.7. This rate in Sub-Saharan Africa is % 61 and in East Asian Countries is % 28.2. Generally, forty percent of the people are living in poor and slum districts. Considering mentioned reasons above and because of migration will not stop, needs of restructuring basing on of cities and districts have increased time to time.

This theory exactly fits young's in turkey. Turkey's grounds especially slum districts and Istanbul regions should be reform because the regions is earthquake zone

before human loss and property damage. The main reason criteria of life quality is abiding by society's fundamental right plan to find a fair solution, this right plan basics have to be considered. For example, economic, physical, social and environmental aspects. To do this, community officials has to work together. Importance of the thesis is (Urban Transformation) emerging from here.

RESEARCHING OF URBAN TRANSFORMATION'S PROGRESS IN TURKEY

In terms of Urban Transformation, The most important reasons of talking about Turkey are shown like as fallows.

1- Turkey has an ancient civilization. Because of this reason, lots of Turkey cities has historical monuments and to cover them from the natural disasters, urbanization, Urban Projects has been making widely.

2- Turkey is one of the developed countries. For this reason, to start a new life and achieve dreams. People live in village and prairie especially teenagers have migrated inner cities quickly. Urban Projects have begun officially to solve formed problems that cause quick inner migration and increasing population in big cities and to skeletonize negative effects.

3- Seismic Earthquake has been occurring in Turkey. To emphasize details of this truth, according to E-newspaper '' World Newsletter'' that published on Saturday 24th May in 2014, 81.637 people died in 56 earthquake that occurred in last 110 years and its magnitude 6 and upper in Turkey. According to horrible figures above and progress of Urban Transformation have begun officially

After the earthquake that occurred in Marmara and Düzce regions in 1999. With the formation of earthquake, the construction that as unplanned and unhealthy has begun be built on with smooth and solid foundation. As history, Urban Formation Fact is so new and that begins coming to agenda in last years for Turkey. After 1999 Marmara Earthquake, The strength of residential area against the earthquake In Istanbul especially in Marmara and in most of areas in Turkey has begun the discussion. Because of this reason, according to some planners, 1999 is admitted the beginning of Urban Transformation in Turkey. But a couple of steps have done for Urban Transformation and especially in terms of Urban Activities after end of 1960s. Whereas after the Marmara Earthquake, that step made more

comprehensive and activities of the Urban Transformation accelerated the progress. Turkey's approaching with the Europe provided developing of economic conditions and internal migration has begun from village to town.

Peasantries who came to begin a new life increased rate of urban population exaggeratedly. When you look at the increasing of population rate by period, in 1927, % 24, in 1960 % 33, in 2000 % 71, population rate has shown an increasing. No: 775 Slum Law was admitted in 1966. Culture and Nature's Presence Protecting Law was issued in 1983, Dated Zoning Law in 1985, although issuing of the laws, none of them includes the inclusive provisions. Angered worries and anxieties by Marmara Earthquake although too late reverberated the life activities. Because of this, a new law entered into force to convert regions that are the under disaster risks. Even, the content and title of law are not compatibility; they have the most comprehensive regulations about Turkey Urban Transformation. Through the law, all aspects of Urban Transformation Facts are investigated in Turkey like purpose, topic, effects, application method and its problems.

HOW SHOULD URBAN TRANSFORMATİON PROJECTS THAT ARE ABLE TO SOLVE URBAN PROBLEMS BE IN TURKEY?

Previously, as historical investigation, inner migration causes increasing of big population, slum districts, these formed slums have been coming immovable for the State. In addition, the State Land was used illegally. Successive Governments tried to solve the problem with the helping of Urban Transformation Projects. The problems became so complicated and serious. Earthquakes and natural disasters caused impending these slums directly. Because of this, to solve said problems effectively, there is a need that is able to achieve the success, not ordinary Urban Transformation unlike planned.

SUCCESS FACTORS OF URBAN TRANSFORMATION PROJECTS

There are main needed means for the successful Urban Transformation progress.

1- REGULATIONS

Law is the state intervenes the operation directly, fallows the Urban Transformation Projects and makes the planning

2- INSTITUTIONAL ENVIRONMENT

Because of Urban Transformation Operation is the complementary progress, it should be

in institutional framework.

3- FINANCIAL SUPPORT

The most important factor of success and failure then without good Financial Support, we cannot start the Urban Transformation.

4- PROGRAMS and PURPOSES

The factor is to evaluate studying for purposes finished later, building vision and working on it in future. The most important purpose is as we said for business scheme.

5- PARTNERSHİPS

Progress is full comprehensive progress. It needs the support of state, private sector and society.

EXAMPLES OF URBAN TRANSFORMATION IN TURKEY

One of the Urban Transformations' Examples in Turkey especially big cities is submitted to summarize in this article.

FIKIRTEPE URBAN TRANSFORMATION PROJECT

Fikirtepe is a region that needs Urban Transformation so much, it is known as its slums and has very population density. Because of it has poured and old infrastructure, located on Istanbul fault line, has houses that earthquake resistant, it is the most needed region the Urban Transformation Government, municipality and private sector have begun building for healthy and good life standard after destroying houses.

The region has two bridges on its both sides. One of them is Göztepe, other one is ''Uzun Şair Köprüsü''. They connect Anatolian side and Europe side each other. Fikirtepe has a very specific geographical position. Being close the Bosphorus Bridge and European side because of these reason, it located in the middle of Istanbul. Thus, increasing population and irregular settlement Is the normal consequence. Also as we said, people migrate indwell close to places where they work and transport location.

Because of these reasons, construction companies, to build new residential buildings and luxury apartments are trying to win a shares from the regionn and competing amongst themselves.

At the same time, Fikirtepe's Disadvantage is located on seismic fault lines because of this, Urban Transformation Projects are competing with the time to build buildings that is earthquake resistant and suitable for life standard inner migration starts to Istanbul

and Fikirtepe. Immigrant is poor as much as not able to settle house. Because of this, they occupied the vacant land without knowing whom belongs.

At that time, the purpose of immigrant was finding a shelter because of this, they built their houses without worrying standard of life and law

As a result, available lands are used unplanned, crooked and inappropriate. Because of this, when you look at the regions, be bold faced.

1- Total floors of building are not much
2- Most of buildings was built with tins and woods
3- Adjacent was used. Blank range wasn't released among the buildings.
4- Because of immigrant needs any shelter in regions, when the functional distribution of building was investigated

Rate of buildings that used as a housing is seen very high.

THE MOST IMPORTANT PROBLEMS İN FIKIRTEPE

Fikirtepe has many kinds of problems according to whole researches done on Fikirtepe. But in this article, wrong using of land that is main reason of problems was tried to investigate.

The problems of discussed Fikirtepe's slums were arranged down.

1- Being less of foundation and complementary services.
2- Road networks was wearied and become dilapidated.
3- Apartments that are built unplanned and not suitable for life standard
4- High increasing population.
5- High rate of unemployment
6- High rate of murder.
7- Wrong using of land that is main problems of up.

PROBLEM OF WRONG LAND USING

In this study, we'll see in detail how the lands are used and how they are used wrong. Buildings in there were built as residential and enough regions weren't collected for utilities. Also, to be result road network is seen inadequate and sleazy. So, existing roads in the regions and houses were built scaliformi asphalt roads were become old and dilapidated. Of course, before as told repeatedly, main reason of the problem, to find a shelter, people came from village and rural areas was building a new house for

Table 1: Land Use (1)

Using of Urban Area	Domain (ha)	(%)
Residence Area	**64,50**	**49,23**
Residence + Trade Area	16,79	12,81
Residence + Small Industry Area	6,43	4,91
Residence + Storage Area	3,37	2,57
Residence + Storage + Trade Area	4,44	3,39
Park Area	**0,44**	**0,34**
Empty Area	1,73	1,32
Management Centre Area	0,02	0,01
Trade Area	0,11	0,08
Storage Area	0,11	0,09
Small Industry Area	4,30	3,28
Small Industry + Trade Area	0,12	0,09
Area of Primary Education Institution	**1,01**	**0,77**
Sociocultural Ins. Area	0,14	0,11
Health Ins. Area	**0,12**	**0,09**
Religion Ins. Area	0,74	0,56
Sport Ins. Area	1,66	1,27
Road Area	24,42	18,64
Total Area	**131**	**100,00**

themselves and their families after occupying. Because of all or most of people came from somewhere have made it, residentials have begun forming as unplanned and not appropriate for law and its standards. When have shown numerically and we have told how it used wrong. With the figures, we examined hectares that were used for residences and services.

The result we got from up is like that, because of Fikirtepe was targeted by the immigrant, more than middle of areas in the region was used for residence, remaining lands were used for roads and utilities. In order to examine more details, let us look at the existing table.

1- IOO: Forms 0.77% of total areas. So, the rate is close to zero because of this, it is telling the culture problems. Said rate forms 1.56% of residence rate in the region.

2- Green Areas: Compared to total area, the rate is close to zero, when it was compared with residence regions, we can see that the green region 3 times the area of houses. Mathematically, green region/ residence region = 0.68 and the rate is very low for crowded region.

3- Health Institutions: Horrible rate is the area of health Ins. Because compared to total area and residence area, we can see very low rate. Rate of Health Ins. / Total Region = 0.09% and Rate of Health Ins. / Residence regions = 0.18% (2).

RESULTS

We can see understand easily Fikirtepe's problems from the rates of the table. Because the problems in there are not old and fusty houses problems, the problem is cultural, social and economic problems. If the problem was fusty houses and worn paths, the problem could be solved with easy methods of engineering before built publishing the whole areas again.

Being less of the services is basis for the other problems. Because if basis services are not supply, life standards and welfare level decrease, poverty, rate of crime increases and level of safety reduces. Also, being less of education Institution increases the ignorance, if it increases so much, social and cultural texture of society is impressed as much as it. If you are careful, in culture, between the said people of the region and people of the other region have a big problem. This gap arises from level of education. Government had to make a comprehensive plan for this problem. According to said problems, after demolished the region it will be built again. Utilities will be distributed properly because of this; the region will be annexed to modern Istanbul removing the factors that cause squatters in the region.

CONCLUSIONS:

1- Basically, the original problem is inner migration, solving of the problem is provided fulfilling some conditions.

2- Delivered of development activities to cities and rural areas equitable.

3- Factories have to open their doors to other cities because most of immigrant have come to work in factories

4- Support of given to forming should be increased and should be got much more incentives for immigrant doesn't leave their lands.

5- The state should deliver power center to all of the cities as balanced.

6- Should be tried to generate a solution, investigating closely the status and worries of immigrants.

7- Should be finished all the slums in Istanbul in a short while based on a certain time period. Because, in close future Marmara Region will be exposed a severe

earthquake.

8- To handle difficulties, should be made strong partnership that among the public, private sector and local people.

9- Preventing the Urban Transformation Project will make as possible using the method of gentrification.

10- Increasing the culture level of slum dwellers. Its benefit is people live in the region can live without worrying in some regions. Because of this, social inequalities decrease and social peace increases.

11- Slums will be built again have to have some properties the creating any utilities, said services, quality consistency, flexibility and extensibility.

12- In order to provide practicing of standards and conditions has to be checked tightly by the state.

13- After the project, investigating thorough, identifying the success, failure, difficulties and weaknesses.

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Bow Tie Antenna Design for GPR Applications

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Abstract

In the recent years, radar systems have developed rapidly. Among developing radar systems, Ground Penetrating Radar (GPR) is also located. GPR systems are used quite effectively in civilian life, military operations and commercial activities. This article contains one of the optimization works which is ensued in the antenna side which the most important part of GPR. In this way, a bow tie antenna will be designed, simulated and fabricated. The fabricated antenna results agree well with the simulation analysis.

Keywords: *GPR, Bow-Tie Antenna*

INTRODUCTION

The system used to obtain information about an object which is behind a barrier, is the special type of Radar called Ground Penetrating Radar (GPR). With using the radar systems, it is possible to get information about location, distance and material type of objects. At first radio waves were used in radar systems, microwave and very High Infrared segments of electromagnetic spectrum are preferred to operate in modern

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world [1]. Through the agency of GPR applications, information about the buried objects and behavior of electromagnetic waves that cross along the obstacle could be analyzed [2]. Civil and military sections are the most popular areas for the GPR applications. In military area, it is commonly used for finding unexploded bombs, underground warehouses, bomb shelters, discovering enemy communication channels, secret rooms [3]. In civil life GPR is commonly applied for finding, buried pipes and undetected voids. Together with these, GPR is used to find people behind the rubble also [4-6].

An antenna in the GPR systems is needed as a transmitter and receiver or both of them at the same time (monostatic Radar). Transmitter antenna generate electromagnetic wave and this wave's scatter to object that buried under the soil or behind the wall. Wave's speed is according to medium's permittivity. When the wave hits the object, some part of wave is reflected from that and receiver antenna catches this part of wave. GPR system principle is shown in figure1.

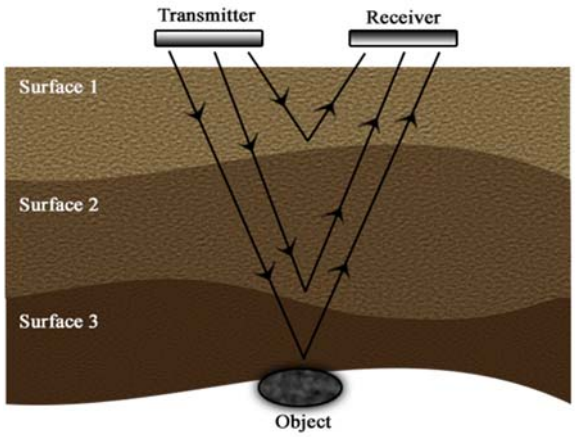


Figure 1. General working principle of GPR.

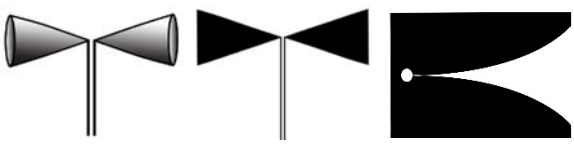
Antenna's range-resolution is quite significant in terms of detecting objects in deeper underground or getting more reliable information about them.

Physical features of antenna also play an important role in GPR systems. If antenna is small and light, it provides convenience in terms of usability of the system.

The efficiency of the antenna is also an important part of the system. The high efficiency provides reliable and more information. Having better antenna efficiency depends on the optimization works in antenna's physical features. [7]

There are a lot of antennas like, horn antenna, Vivaldi antenna and microstrip antennas that are used in GPR systems [8].

Biconic, Bow-Tie and Vivaldi antenna shapes demonstrated in Figure 2. Using circular polarized antenna is recommended in the literature for getting better result in multilayer medium [9-11].



(a) (b) (c)

Figure 2. Some GPR antennas; (a) Biconic antenna, (b) Bow-tie antenna, (c) Vivaldi antenna.

The main features taken into consideration to select the most suitable antenna are the center operating frequency of the antenna, gain, bandwidth and also antenna size.

When central operating frequency is adjusted to minimum 1 GHz, bionic, TEM Horn and Vivaldi antennas have to be quite large structures. It is shown that Bow-Tie antenna is the optimal antenna in terms of size, among mentioned antennas. When the mentioned antennas evaluated in term of gaining, these antennas have points where their gaining's are pretty enough in terms of their capacities. Bow-Tie antenna is determined the best suitable antenna type to be used in this work. Bow-Tie antenna is determinative for the use of GPR applications in terms of being light considering its design, being smaller when it is compared to other antenna types in constant frequency and in having higher gain in another similar comparison. In this paper, firstly a new Bow-Tie antenna will be designed. In the light of the results obtained during the simulations performed a performance improvement of the antenna will become more efficient. These results which will be revealed by analyzing the antenna parameters in a detailed way and by working on these parameters will provide an insight to the antenna designs in the future. The simulation and fabricated results will be presented in next steps.

GEOMETRY OF ANTENNA

Geometric structure of the proposed antenna is shown in Figure 3.

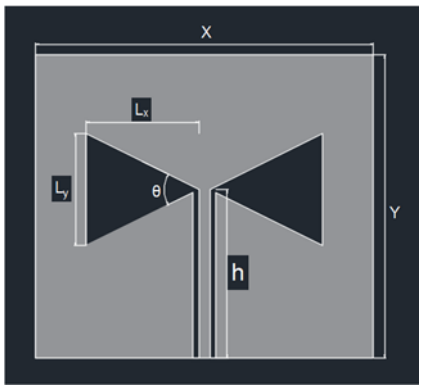
In the proposed bow-tie antenna used as an epoxy material ε_r = 4.4 which is FR4

substrate. Dimensions are 195 x 235 x 0.8 mm^3. The antenna feed 50 Ohm SMA connector. the antenna feed path length h = 150 mm. Lx=110mm affecting the antenna's efficiency and operating frequency largely, and length of Ly is 70 mm. Made in different designs, the optimum angle θ is defined as θ = 35 °.

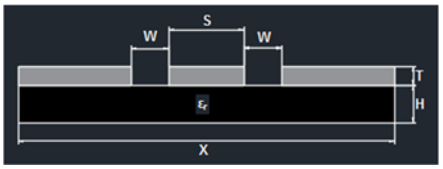
As a result of the changes made on all parameters, the different operating frequency and bandwidth could be obtained according to the antenna size and geometry.

RESULTS AND DISCUSSION

The proposed bow-tie antenna individually by considering all parameters were studied, simulated and optimized by Ansoft HFSS ver.15. Initially, the improvements had discussed the antenna S11 parameter's graphics. Improvements made by considering the antenna size done and is as follows.



(a)



(b)

Figure 3. The geometric structure of the proposed antenna. **(a)** Top view. **(b)** Side view.

Table I. Antenna diameters

Parameters	**Ant.1**	**Ant.2**	**Ant.3**	**Ant.4**	**Ant.5**
Y (mm)	235	235	235	215	195
X (mm)	235	235	235	235	235
Lx (mm)	100	110	110	110	110
Ly (mm)	90	90	70	70	70
h (mm)	150	150	150	150	150
θ (degree)	48	44	35	35	35
H (mm)	0.8	0.8	0.8	0.8	0.8

Table I shows the dimension optimization during the design process step by step. To every improvement works in the Table I it can be observed; in the first antenna (Ant.1) X and Y values are equal to each other and are 235 mm. Lx and Ly values were determined in the form of 100 mm and 90 mm. Triangle-shaped structures within the antenna affect the antenna's S11 value and gain. With the improvement in the second antenna (Ant.2) angle θ reduced and a larger triangle structure is formed by this step. The third antenna (Ant.3) X and Y values are kept constant at 235 mm Ly = reduced to 70 mm, and the θ angle reduced to 35 degrees that changed the current distribution. Thus antenna S11 values will continue to give better results. Each new modification, the antenna while moving a little further, the antenna is desirably smaller. Therefore, antenna of the triangle parts of are made by cutting the top part of the structure that includes touching the substrate is set at X = 215 mm. Therefore, parts of the antenna excluding the triangle made by cutting the top part of the structure including the substrate is set at X = 215 mm. This is happening in S11 values have made more efficient. Before taking final shape of the antenna, cut again, this time from the bottom of the antenna with the same method it has been reduced to 195 mm X = value. Fifth antenna (Ant.5) gives the best results according to the obtained results. The figure 4 represents the five antenna's simulation results of S11 chart. The S11 parameters of simulated and fabricated of Ant.5 is shown in figure 5.

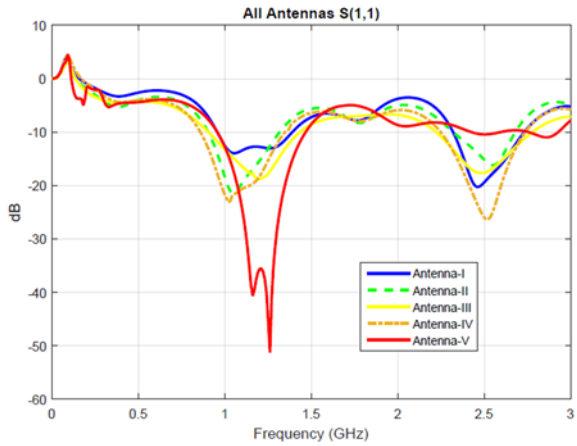


Figure 4. S11 graphs of simulated antenna.

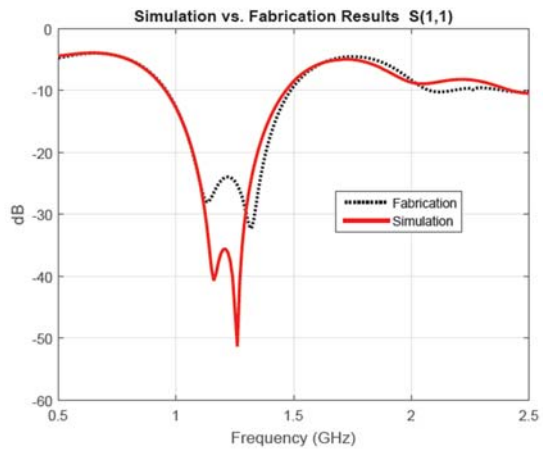


Figure 5. Measured and simulated diagrams of S11 parameter for proposed antenna (Ant.5).

The antenna bandwidth starts from the 0.8 GHz; according to the first simulation, the bandwidth is widened. When the result of improvements of the third antenna, changes in a significant improvement in low frequency, but there is a second resonance at higher frequency. But the goal; to be able to get a good result at low frequency. The result of the fourth antenna in compare with third one, despite downsizing is protected. In the proposed antenna (Ant.5) by last modification the best result is acquired. Below -10 dB of S11 parameter in the frequency range 0.9-1.5 GHz, by means 0.6 GHz bandwidth was obtained. The antenna is designed in the last step; it is seen that the current distribution is homogeneous. As clear in figure 6 making an effective and uniform radiation in all areas of the antenna also been observed. The fabricated bow tie antenna is shown in the Figure 7.

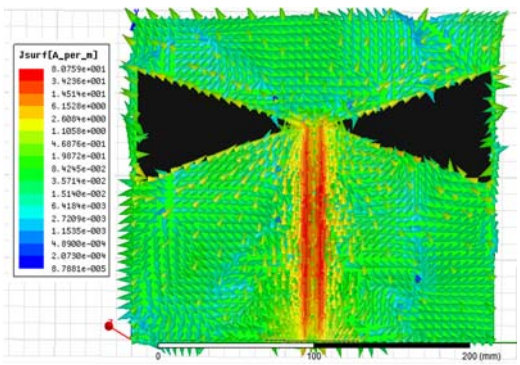


Figure 6. Current distribution demonstration.

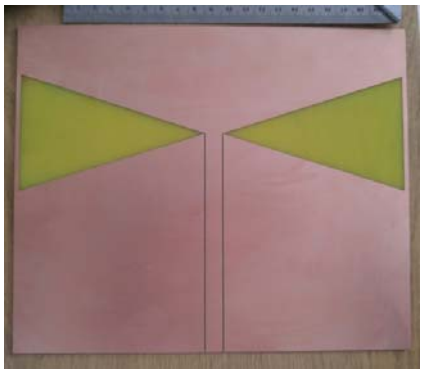


Figure 7. Photograph of fabricated Bow tie Antenna

Figure 8, shows the radiation pattern of the final version of the antenna in different θ and φ. 3D graphics and patterns that become the end of the antenna gain values is observed after the simulation as follows in Figure 9.

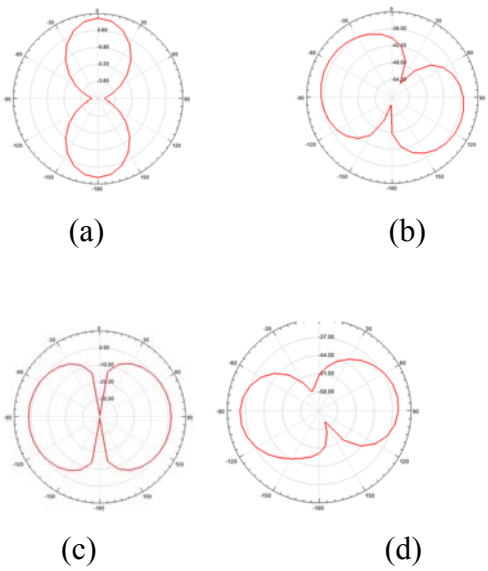


Figure 8. Radiation pattern of proposed antenna at (a) φ=0°, (b)φ=90°, (c) θ =0°and (d) θ =90°.

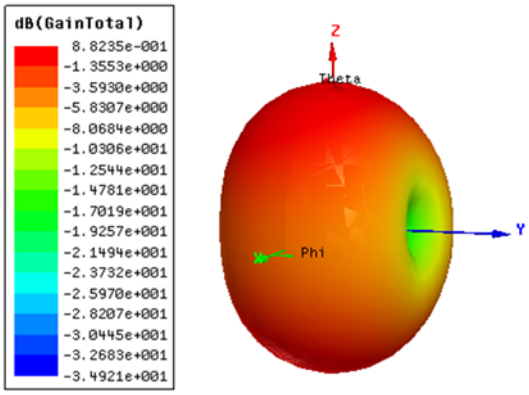


Figure 9. 3D antenna gain plot.

CONCLUSION

The most important part of GPR system is antenna. The system improvements in antenna designing way, will provide better results in GPR applications. Bow-Tie antenna advantages has been evaluated and the results of optimization studies to provide better results for GPR applications were made. These studies were made as a result of the antenna size to be working in both small and optimum operating frequency. As a result, the size of 195x235x0.8 mm^3 was observed that the ideal dimensions. Using Relative permittivity's 4.4 with FR4 epoxy substrate with 0.8 mm thickness, it was chosen the most appropriate in terms of cost. Lx and Ly value of the triangle of the antenna structure 110 mm and 70 mm in length, the angle θ of 35 degrees to give the best results, simulation results were obtained. In light of these values, and received θ pattern for results, gain values, current distribution and radiation pattern graphical representations show that they are the best at this point of the antenna design. Specifically designed for this antenna will be able to obtain more detailed and reliable information about an object in the deep. It produced at less cost through downsizing in design work and offers easier use of the opportunity.

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A Compact Size Reconfigurable Triple Square Ring Patch Planar Antenna

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***Y. ZEHFOROOSH*[2]**

Abstract

A compact reconfigurable microstrip slot antenna with switchable single and dual band notch functions for Multiband applications is presented in this study. The antenna is capable of exhibiting three different performances of UWB spectrum coverage, UWB coverage with single rejection of thewireless local area network (WLAN) band, UWB coverage with single rejection of the WiMAX and C-band spectrum, andUWB coverage with dual band notch function at the WLAN, the WiMAX and the C-band frequencies. Good results is achieved at different performances of the antenna. The designed antennahas a small size of 20 × 20 mm^2

Keywords: *Reconfigurability Antenna, Triple Square Antenna, Planar Antenna, Patch Planar Antenna*

Introduction

The development of wireless communications and theincreasing demand for operating frequency bands have madethe radio spectrum congested and different radio systemsoverlap because of their standard frequency band allocations.The wide frequency range of the ultra-wideband (UWB)systems which because of the FCC's allocations is spreadbetween 3.1 and 10.6 GHz will cause interference in theexisting wireless communication systems, such as the wirelesslocal area network (WLAN) for IEEE 802.11a operating inthe 5.15–5.35 and the 5.725–5.825 GHz bands, WiMAXoperating in 3.3–3.6 GHz and C-band operating in 3.7–4.2GHz, hence, the UWB antenna with single and dualband-stop performances is required [1–3]. Consequently,recently, several planar microstrip monopole and slotantennas with single and multiple band notch

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performanceshave been presented [4–9]. However, these antennas havefixed band notch characteristics and in cases where there isno interference, they are unable to utilize the whole UWBfrequency band. Hence, in order to improve the performanceof the UWB system, antennas with reconfigurable structureswhich exhibit switchable band notch performances aredesirable [10–13]. The main advantage of this kind ofantennas is that they are able to utilize the whole UWBspectrum and when an interfering signal appears the antennacan change its configuration in such a way as to produce aband-notch function which eliminates the interference withthe coexistent system. Different kind of RF switches such asmetal semiconductor field effect transistor (MESFET), RFMEMS and PIN diodes can be used to create thereconfiguration of the antenna structure. Any of theseswitches has their own advantages and disadvantages [14]. In[15], RF microelectromechanical system (MEMS) are used toform a reconfigurable microstrip monopole antenna withswitchable single band notch performance, whereas in [16], aPIN diode is used for the same reason on a microstrip slotantenna. The reconfigurable antennas with switchableband-notched functions can be used in cognitive andintelligent radio systems [3].

In this paper a compact multiband antenna that capable to switching between different frequencies will be presented. The antenna in order to switch between different statusesuses of two pin diodes.

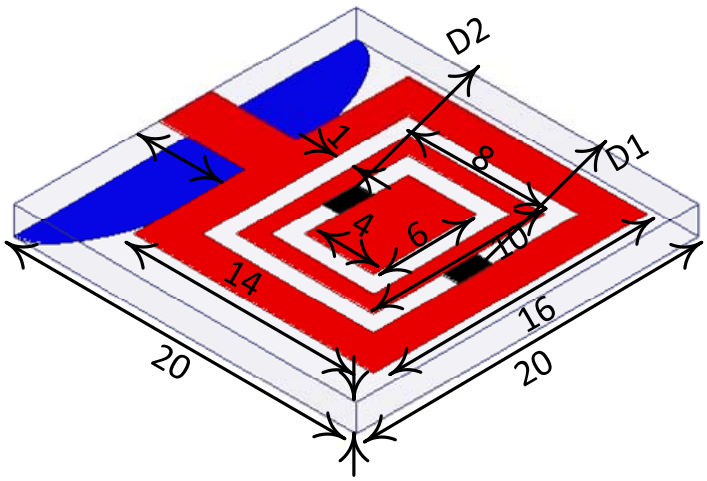

Fig.1 configuration of antenna structure

The proposed reconfigurable microstrip slot antenna configuration with its design parameters is shown in Fig. 1, which is printed on an FR4 substrate with a thickness of 0.8 mm, a permittivity of 4.4 and a loss tangent of 0.018. As observed in Fig. 1, the basic antenna structure consists of a half elliptical ground, a microstrip feed-line and a square radiating patch. In the design procedure of the Multiband microstrip antennas, the basic antenna structure must be designed so as to have a multi-resonance performance in the Multiband spectrum and then by modification of the antenna structure such as cutting slots or notches with suitable dimensions on the metallic parts of the antenna additional resonances can be excited in order to improve the bandwidth of the antenna. Also, addend characteristics such as band-notch function can be introduced to the performance of the antenna through etching slots with proper dimensions on the metallic sections of the antenna. All dimension of antenna is created on Fig.1.

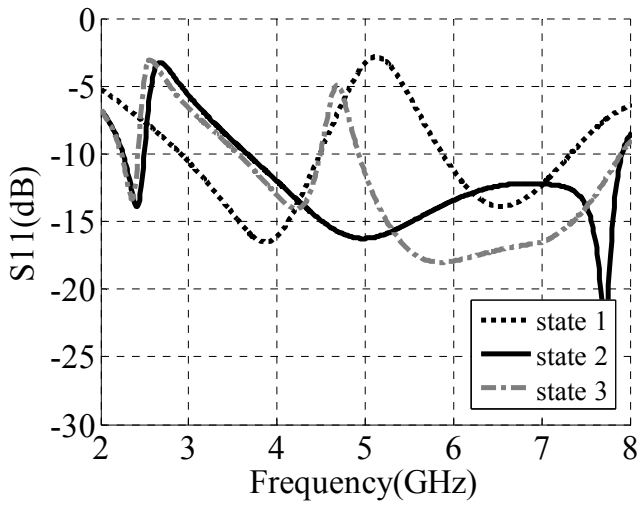

Fig. 2. Simulated S_{11} of the proposed reconfigurable Multiband antenna for different biasing statuses of the PIN diodes in Table 1.

Table 1.various state of PIN diodes

State	Diode 1	Diode 2
1	OFF	OFF
2	ON	OFF
3	ON	ON

The simulatedresults are obtained by using Ansoft Simulation SoftwareHigh Frequency Structure Simulator (HFSS) [17].Fig. 7 shows therealized antenna and its simulated S11 characteristics fordifferent on and off statuses of the PIN diodes are presentedin Fig. 2.

The simulated pattern of the fabricated antenna including the co-polarization and cross-polarization in the H-plane (X−Z plane) and E-plane (Y−Z plane), respectively, for its dual band notch performance at three various frequencies is depicted in Fig. 3. As observed in this figure, the antenna has suitable radiation in a wide range of frequencies and also the radiation patterns in the X−Z plane are almost Omni-directional. As observed in this figure, for the dual band-notch performance of the antenna, the gain drops dramatically at the notched frequency bands.

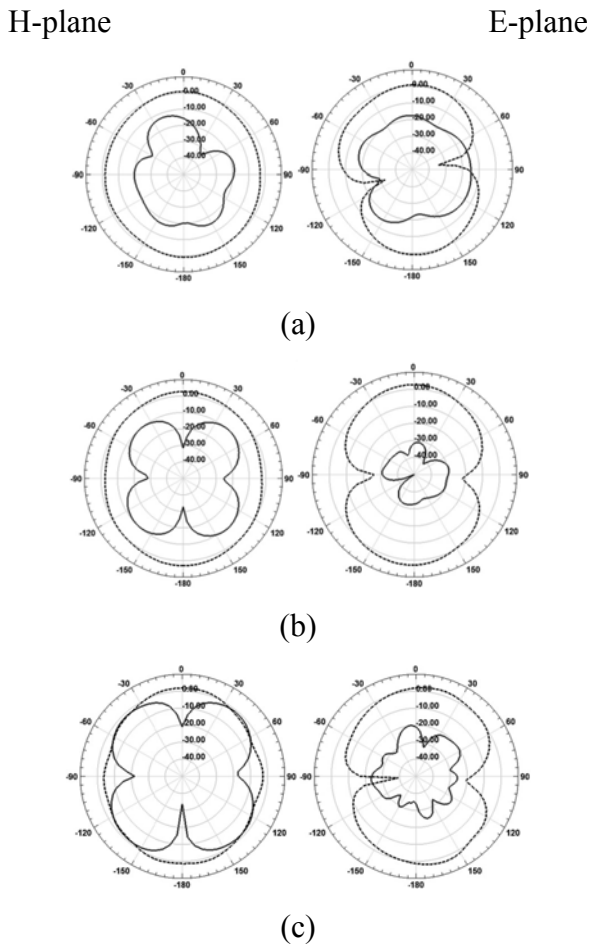

Fig. 3 Simulated radiation patterns for the dual notch band performance of the proposed antenna at(a: 2.4 GHz, b: 4 GHz and c: 5.5 GHz)

Conclusion

In this paper, a novel compact reconfigurable printed slot antenna with switchable single band notch and dual band notch performances has been proposed for the broad band applications. In the proposed antenna, wider and improved impedance bandwidth especially at the higher frequency band is obtained by cutting two modified notches on the feed-line. Switchable single and dual band notch functions are obtained by cutting the modified slots on the feed-line and embedding two PIN diodes along the slots. By changing the bias statuses of the PIN diodes, the antenna is able to switch between its various frequencies responses.

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Evaluatıon of the Effects of Franchısıng Assocıatıons on Franchısıng Decısıons of Companıes in Turkey

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İlkay KARADUMAN[2]

Abstract

In the study, it is examined the effect of International Franchising Association (UFRAD) on tbe decision making process of franchisee companies. A survey has been carried out on franchisee companies, after the survey interview, results are discussed and presented. Franchising offers a useful way to entrepreneurs to start a new business. Operating franchising, franchisor has a trademark and the franchisee sells products under the name of the franchisers areas of advertising, training, management and the benefit as a whole package of 1itera discounts. To be successful at work without experience in training people and work for managing continuous assistance Franchising is the best approach because it is a form of giving a license from the elements.

Keywords: *Franchising, Franchising Decisions, Franchising Associations*

INTRODUCTION

In this study, the expanding application of entrepreneurship in franchising are discussed. The academic results of the studies about franchising practices, their brands and subsequently the extended growth of the company suggests that it is of great importance for the development of entrepreneurship. In the theoretical part of the study the concept and principles of franchising, the history of franchising in Turkey and the world and the development of franchising, types and definitions, underlying

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principles and elements of the franchising system, basic principles of franchising, franchising system, the franchisor and the franchisee in terms of benefits and drawbacks, risks and emerging issues of franchise applications, the factors that lead to success or failure in the application of franchising from a legal perspective franchising system in Turkey Franchising and contract incentives to prevent the effective functioning of Turkey's entry into the franchising system in the decision, the economic size of franchising, the franchisee is made according to the principle of voluntariness and face-to-face with the survey participants. Input to decisions on the effect of franchising system in Turkey with franchise businesses financial association of the survey were studied.

The purpose of the study is to obtain general information regarding the applications of the franchising system which is developing rapidly by franchisees; to determine whether franchisees are aware of their identities; to determine the difficulties to buy a franchise; to determine how the contract terms are set; to determine how to choose a franchisee; to determine what kinds of help are provided by franchisors; to determine whether franchisees feel independent; to determine the expectations of the franchisees from the master franchisors before signing the contract and whether those expectations were met. Data collection method was used in the research. The data collected through survey were questionnaires and analyzed in SPSS program. Percentage distribution and building cross correlation techniques were used in the data analysis.

The study endeavored to identify the applications of franchising system in Turkey. The survey group included the members of UFRAD Franchising Association, both franchisors and franchisees. Franchisors were interviewed by phone and those who accepted to participate in the survey were given the information of franchisees they work with. A total of 150 franchisees' email addresses were obtained. The questionnaire which consists of 34 questions has been prepared after a literature review and taking into consideration of the previous researches. Survey questionnaire is included in Appendix 1. The questionnaire was tested on 140 franchisees of 15 UFRAD Franchising Association members from different sectors. After necessary adjustments were made to the questionnaire, it was sent via email to 140 franchisees. The surveys sent indicated the aim of the research questions and indicated that the identity of the respondents would remain anonymous and the

participants were encouraged to take the survey and the responses were evaluated.

LITERATURE REVIEW

The economy with business globalization and the rise of action due to intensified competitive pressure companies give to business and management systems requires constant re-orientation of spending and reviews of marketing strategies. In this sense, this is the most suitable methods for the growth of the franchising business.

The word “franchising” comes from French “Franche” and it is a “contractual form of business under which one firm purchases the right to use a brand name and operating system of another” (Shane & Hoy, 1996). As Martin (1988) mentioned “franchising is an important and controversial form of vertical integration”. A franchising agreement is a continuum based on trade relations between two parties. As Cebeci (2005) mentioned “franchising is a two-way merger”.

Franchising a product or business service to a party's management or organization to related information and support know-how to provide the party ideas of business affairs for a long-term nature of the business given Franchisor to carry out work for a period of time and within the restrictions and the whole continuous business relationship .Generally, the company, one's own system, or the name that is well known and recognized by its products or services, contacts the necessary authorities then an agreement by the businesses or given marketing authorization, as long as it is depending on a specific employment contract brought forward by complying with standards to engage in a collaboration use and marketing activities in return for payment to understand as to be understood (Öztürk, 2006).

Franchisee; the direct or indirect financial consideration in exchange for the Franchisor's trade name / mark, know-how, business vision and technical methods, systems and brand specific sales-service points and / or of independent investors who applied taking to deal with the rights to .Franchisor, and the founder of the franchise system itself consists of individual franchisees and the long-term protection. Franchisor, as the system itself who might, just might be someone else have the authority to sell the franchise rights. Franchise-operated with the same system in their business or businesses that may or may not be.

Franchise (or franchising), is a system or owner of a brand, within certain terms and limits, By providing business management and ongoing discipline and support to the organization, with a certain price, the link between investors and independent system of usage-based brand is a long-term and steady business relationship (Dermut, 2002).

Researches on franchising are usually about resource scarcity, agency theory, and plural form symbiosis-to answer questions about why, where, and how often firms use franchising (Combs, Michael, & Castrogiovanni, 2004). Franchising theory has a wide area of research and leading study areas and studies can be seen in Table 1:

Table 1: Literature Review on Franchising Theory

Studies on Franchising Theory	(e.g. Combs, Michael, & Castrogiovanni, 2004; Dant, Grönhagen, & Windsperger, 2011; Elango & Fried, 1997; Inma, 2005; Lafontaine, 1992; Madanoglu, Lee, & Castrogiovanni, 2011; Martin, 1988; Salar & Salar, 2014; Tracey & Jarvis, 2007; Yorke, 1993; Anwar, 2011; Dant et al., 2011; De Castro, Mota, & Marnoto, 2009)

Major characteristics of the franchise system is listed below (Yüksel, 2004):

- Franchising is a system based on: a franchisor (or franchise) integrated to contract under a particular brand of product or service offered by a business model. This is often based on its own builded again that the franchisee creates opportunities by distribution.
- During the implamentation of the franchising system the franchise receiver companies are given control over an are of the company and are able to authorise activities. The franchisor in the franchise areas of the system's operation process has control over the company, according to standards and methods defined by the name of the concession agreement stemming from the necessity to transmit.
- Franchising, is the establishment of the business for franchise firms, the preparation of organizational and management models, the implementation of marketing activities, training of staff and others will be evaluated in this context, operating on a feature activities with that obligation to be that the help and support for handling travelers

International franchising is also a good area of research. Many studies on international franchising can be found in the literature (e.g. Hoffman & Preble, 2004; Quinn & Alexander, 2002; Sashi & Karuppur, 2002; Wulff, 2005). In his study Alon (2006) researched global service franchising. Asarpota (2014)'s study examined operational issues in global franchising. Baena (2009) studied international franchising in emerging markets. Franchising system has some advantages and disadvantages for franchisor and franchisee (Knight, 1986). Salar & Salar (2014) examined these advantages and disadvantages by using SWOT analysis in their study. The people who gain too many people in the franchise system and has a chance to benefit. Both sides equally affect and improves the reduction of investment in terms of people that this system, fast cash inflows, steady income, quickly spread over the effective management of reach profit from the market, increased advertising strength, increasing brand recognition, greater purchasing power, better places There, negotiated businesses, effective distribution, fast collection, the information market benefits including the ability to stream and control would be concerned. Franchise systems, undoubtedly became so widely spread because it is a useful practice for both the franchise taker and the franchise provider (Ulaş, 1999). The franchisor already owns a successful, profitable and accepted brand and business. If the owners wishes they can expand this brand by opening branches, or they can force all customers to come to them. They are free to evaluate which strategy will be more advantageous and decide on a course of action.

Firms can achieve a competitive advantage in today's increasingly competitive business environment, it is possible to provide a high level of consumer satisfaction. Comparing the greatest benefit of the system is the system independence on all operations from the manufacturer to the consumer in the distribution channel, which is systematise. In addition, vertically integrated systems reduces costs by reducing the numbers of intermediaries in the channel and increases the coordination of activities, reduce storage and other costs. Studies in the literature show that it provides great advantages over independent retailers in the retail trade of the franchise system (Doherty & Quinn, 1999; Doherty, 2009).

When we look at the functioning of the system in our country, we can see that franchise businesse primarily stands out from the manufacturer. Sales Channels of distribution

networks based on a uniform signs is transforming into a franchise system with similar makeup and showcase as decoration. Their decisive hand "product brand" are used and expressed in these chain stores and sold a hundred times if` it is possible to see the transforming of a real franchise system. From apparel to the woodwork on this issue, from fast food to white goods, automotive, etc. It is possible to give many examples from different industries (Öğdüm, 1994).

The delights of our local brand, we look at the services and prices possible to ensure that we provide customers satisfaction. However, it can fall short of organizing and managing of foreigners. The majority if one day fall could spread to the world the brand is not put into practice. Another characteristic feature of our country is that it creates unfair competition practices in the business of providing adequate supervision by the state's small producers and service. Few outsiders enter the cheapness usually half the company's standards and care provided to our consumer brands and quality is far below the developed countries (Ulaş, 1999). Experts agree that Turkey will continue its growth in the franchise market in 2014. Dealership market and retail sector in Turkey will continue ro grow rapidly. Foreign Mansel future new investors. It will open branches in the domestic as well as overseas as domestic chains. The number of national markets brand will increase in Anatolia. UFRAD (International Franchise Association) data, there is 876 chain stores in Turkey. 24% of them foreign, 74% of Turkish origin brands. They belong to 50 thousand branches around the franchise or the franchise system is growing. There franchisor 471thousand companies in Turkey. The percentage of chains 78%. Only the chains themselves opening their own branches operating rate of 22%. Not so until five years from now the number of franchise companies that ranged from 400-500. Even these figures only show tremendous growth in the franchise market. The annual volume of the market consisting of the representatives of these brands have reached $ 35 billion. Three topics as the dynamo of the rapid growth in the franchise market in 2014 burgulanıy. Shopping center (AVM), increasing the number, the rapid development of socialization and culture of eating and drinking out. According to experts, increasing urbanization and the impact of the shopping center to be opened in the franchise market will grow in 2014. Food and drink industry sector is without doubt the most remarkable in the franchise market. Companies operating in this area are opening branches one after the other.

Franchising Associations The World Franchise Council (WFC) is a non- political organization of more than 40 national franchise associations from around the World. Formed in 1994, it aims to promote the growth of franchising internationally and to facilitate best practice in franchise association management among its members. It also aims to foster and encourage the development of franchising associations in nations where such an association does not currently exist. (http://www.worldfranchisecouncil.net/)

Table 2: The World Franchise Council Country Members

Argentina	Australia	Austria	Belgium	Brazil	Britain
Canada	China	Croatia	Czech	Denmark	Ecuador
Egypt	Finland	France	Germany	Greece	Guatemala
Hong Kong	Hungary	India	Indonesia	Italy	Japan
Korea	Lebanon	Malaysia	Mexico	Morocco	Netherlands
New Zealand	Philippines	Poland	Portugal	Russia	Singapore
Slovenia	South Africa	Sweden	Switzerland	Taiwan	Turkey
USA	Venezuela				

Turkish Franchise Association-UFRAD is the first and only representative of franchising sector in our country. Established in 1991, UFRAD-Turkish Franchising Association's main purpose is to enhance trust relations in the franchising system while improving and enlarging the sector. Today, as one of the oldest and strongest franchising associations in the world, UFRAD has more than 100 internationally recognized firms under its roof. Their other important contributions to the national economy is increasing the management quality levels of production, increasing the demand for quality products, and creating employment opportunities.

METHODOLOGY AND HYPOTHESES

In this study a survey has been conducted in order to collect data in a reliable way and to conduct statistical analysis to UFRAD member franchisors. Literature review is conducted to develop the survey questionnaire and to determine motivating factors.

Motivating factors of franchisees to purchase franchises were organized using five-level Likert item. Survey items were organized on a

fundamental factors level in order to obtain actual thoughts of the participants who are the members of UFRAD. Questionnaire was distributed to 15 franchisors, all UFRAD members, and their franchisees, all entrepreneurs, a total of 140 individuals via email, phone and one on one basis and answers were obtained. Before the survey was conducted, an extensive information was given to the participants.

The research conducted was aimed at UFRAD Franchising Association members. The survey provided the members of UFRAD, franchisors and their franchisees, to develop in sociocultural aspects and pertain franchising. Franchisors and their franchisees in Turkey were determined through UFRAD Franchising Association's catalogs and brochures. The main population of the research is made up of franchisors and their franchisees.

The main purpose of the research is to determine and study the factors motivating franchisees to purchase a franchise and make suggestions to franchisors in order for them to succeed. Theoretically there are many factors that motivate franchisees to do business in franchising system. Whether the factors that motivate the businesses within the same field are the same was one of the subject studied in this research.

The answer to the following question was researched during the study:

"Do benefits received by UFRAD members in different sectors differ?"

The following hypotheses were created in line with the research question determined during thesis study:

H_1: Benefits gained by UFRAD members in food industry differ from members in different sectors.

$H_{1.1}$: *Benefits gained by UFRAD members in food industry differ in terms of education from the members in different sectors.*

$H_{1.2}$: *Benefits gained by UFRAD members in food industry differ in terms of adaptation from the members in different sectors.*

$H_{1.3}$: *Benefits gained by UFRAD members in food industry differ in terms of profitability from the members in different sectors.*

$H_{1.4}$: *Benefits gained by UFRAD members in food industry differ in terms of location and order from the members in different sectors.*

H_2: Benefits gained by UFRAD members in retail industry differ from members in different sectors.

$H_{2.1}$: *Benefits gained by UFRAD members in retail industry differ in terms of education from the members in different sectors.*

$H_{2.2}$: *Benefits gained by UFRAD members in retail industry differ in terms of adaptation from the members in different sectors.*

$H_{2.3}$: *Benefits gained by UFRAD members in retail industry differ in terms of profitability from the members in different sectors.*

$H_{2.4}$: *Benefits gained by UFRAD members in retail industry differ in terms of location and order from the members in different sectors.*

H_3: Benefits gained by UFRAD members in service industry differ from members in different sectors.

$H_{3.1}$: *Benefits gained by UFRAD members in service industry differ in terms of education from the members in different sectors.*

$H_{3.2}$: *Benefits gained by UFRAD members in service industry differ in terms of adaptation from the members in different sectors.*

$H_{3.3}$: *Benefits gained by UFRAD members in service industry differ in terms of profitability from the members in different sectors.*

$H_{3.4}$: *Benefits gained by UFRAD members in service industry differ in terms of location and order from the members in different sectors.*

RESEARCH FINDINGS

SPSS 22.0 statistical program was used to evaluate the data collected. Descriptive statistics module of the program was used to demographics of the participants and the determination of their participation on Likert items. After descriptive analysis, reliability analysis, factor analysis and one-way analysis of variance (ANOVA), to determine whether there are differences between the means of two or more independent variables analysis, were applied in the study.

The answers to the survey by UFRAD members, both franchisors and franchisees, were entered into SPSS 22.0. Motivating factors variables were combined in SPSS under 'motivating factors.' Demographics of the participants are as follows.

Table 3: Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	134	95.7	95.7	95.7
	Female	6	4.3	4.3	100.0
	Total	140	100.0	100.0	

Participants who accepted to participate in the research are 95.7% (134 individuals) male and 4.3 (6 individuals) female.

Table 4: Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	30-39	50	35.7	35.7	35.7
	40-49	65	46.4	46.4	82.1
	50-59	25	17.9	17.9	100.0
	Total	140	100.0	100.0	

50 of the participants, who are franchisees, are between the ages of 30-39, 65 participants are between 40-49, and 25 participants are between 50-59. There are no participants under the age of 20.

Table 5: Education

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Associates	55	39.3	39.3	39.3
	Bachelors	65	53.6	53.6	92.9
	Masters	10	7.1	7.1	100.0
	Total	140	100.0	100.0	

65 franchisees who participated in the research have bachelor's degree, 55 participants have associates degree and 10 have master's degree.

Table 6: Positions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Owner of Business or Directors	45	32.1	32.1	32.1
	General Manager	80	57.1	57.1	89.3
	Restaurant Managers and Others	15	10.7	10.7	100.0
	Total	140	100.0	100.0	

80 franchisees who participated in the research are general managers, 45 participants are owners of the businesses or directors and 15 are restaurant managers. Majority of the participants are composed of business owners and directors and general managers.

Table 7: Type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	International Brands	110	78.6	78.6	78.6
	National Brands	30	21.4	21.4	100.0
	Total	140	100.0	100.0	

110 participants who accepted to participate in the research have international brands and 30 have national brands.

Table 8: Number of Employees Participants Employ

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	3 Person	1	.7	.7	.7
	4 Person	6	4.3	4.3	5.0
	5 Person	31	22.1	22.1	27.1
	6 Person	14	10.0	10.0	37.1
	7 Person	16	11.4	11.4	48.6
	8 Person	22	15.7	15.7	64.3
	9 Person	37	26.4	26.4	90.7
	10 Person	5	3.6	3.6	94.3
	11 Person	5	3.6	3.6	97.9
	12 Person	1	.7	.7	98.6
	13 Person	1	.7	.7	99.3
	14 Person	1	.7	.7	100.0
	Total	140	100.0	100.0	

Participants who accepted to participate in the research have given the following information about the number of employees they have: 1 company has 3 employees, 6 companies have 4 employees, 31 companies have 5 employees, 14 companies have 6 employees, 16 companies have 7 employees, 22 companies have 8 employees, 37 companies have 9 employees, 5 companies have 10 employees, 5 companies have 11 employees, 1 company has 12 employees, 1 company has 13 employees, 1 company has 14 employees. This clearly indicates that all the companies surveyed are Small and Medium Sized Enterprises. Cronbach's Alpha computed through internal consistency analysis has the following values: First item has the Cronbach's Alpha coefficient of 0.722,

second item 0.906, third item 0.899 and fourth item 0.822 and for the four items is 0.928, suggesting that the items have relatively high internal consistency and the survey has a high level of reliability.

Table 9: Reliability Analysis Results

Variance	Cronbach's Alpha	N of Items
Education	.722	9
Adaptability	.906	5
Profitability	.899	8
Location and Order	.822	3
Toplam	.928	25

Survey questionnaire has 9 questions to scale the benefits gained from UFRAD in the field of education, 8 questions to scale profitability, 5 questions to scale adaptability and 3 questions to scale the benefits gained in location and order. Factor analysis applied through SPSS 22. Results can be found in Table 8.

Table 10: Results of the Factor Analysis

Factors	Factor Loading	Values of the Variations	Reliability Values	KMO ve Barlett's Test
Education				
E1	0.907	81.420	0.722	Kaiser-Meyer-Olkin (KMO) :0.950 Barlett:
E5	0.887			
E6	0.871			
E7	0.852			
E9	0.847			
E10	0.875			
E11	0.845			
E12	0.852			

E13	0.711			Ort.Kikare: 50683.772 df:66 sig.: .000
Adaptability				
A14	0.828	88.763	0.906	
A16	0.827			
A17	0.833			
A20	0.820			
A25	0.800			
Profitabilitiy				
P8	0.859	82.654	0.899	
P15	0.862			
P18	0.867			
P19	0.876			
P21	0.859			
P22	0.846			
P23	0.843			
P24	0.834			
Location and Order				
LO2	0.873	84.227	0.822	
LO3	0.892			
LO4	0.874			

Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy to assess the adequacy of their correlation matrices for factor analysis. KMO value on Table 8 is 0.950. KMO values higher than 0.8 indicate the data is appropriate for factor analysis. Factor analysis reveals that factors are weighted on four different groups.

Welch Test is used to test homogeneity of variance in one-way analysis of variance (ANOVA) analysis and variances are tested to be homogeneous. Post hoc tests whether we have an overall difference between our groups and which specific groups differ. One of the post hoc tests is Scheffe test if data meet the assumption of homogeneity of variances. At the following table, participants' positive attitude towards advertising can be found and variables used in the study are important for each of the differences in cross-sectors

. **Table 11:** The Results of ANOVA Analysis

		Sum of Squares	df	Mean Square	F	Sig.
Location and Order Average	Between Groups	4.822	2	2.411	13.512	.000
	Within Groups	24.444	137	.178		
	Total	29.266	139			
Education Average	Between Groups	3.403	2	1.702	24.634	.000
	Within Groups	9.463	137	.069		
	Total	12.866	139			
Adaptability Average	Between Groups	28.587	2	14.293	133.761	.000
	Within Groups	14.639	137	.107		
	Total	43.226	139			
Profitability Average	Between Groups	37.379	2	18.690	164.204	.000
	Within Groups	15.593	137	.114		
	Total	52.973	139			

The following table shows the findings and comparisons of both Scheffe test when the variations are homogeneous and Tamhane test when the variations are not homogeneous. Scheffe post hoc pairwise comparisons are used when there is a difference between more than two groups' means. Scheffe is the most used multiple comparison test after F test. Scheffe test is used to compare all possible linear combinations. The method is the most conservative because it keeps the error rate α under control, and the most flexible post hoc procedure and it doesn't take into account the hypothesis that observation numbers are equal. In analysis table, sectors are grouped under (1) Food, (2) Retail and (3) Service.

Table 12: Multiple Comparisons

Dependent Variable		(I) V1	(J) V1	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Location and Order Averager	Scheffe	1	2	-.42429*	.08706	.000	-.6398	-.2088
			3	-.29466*	.08706	.004	-.5101	-.0792
		2	1	.42429*	.08706	.000	.2088	.6398
			3	.12963	.09956	.431	-.1168	.3760
		3	1	.29466*	.08706	.004	.0792	.5101
			2	-.12963	.09956	.431	-.3760	.1168
	Tamhane	1	2	-.42429*	.09048	.000	-.6451	-.2035
			3	-.29466*	.07773	.001	-.4836	-.1057
		2	1	.42429*	.09048	.000	.2035	.6451
			3	.12963	.08848	.381	-.0872	.3465
		3	1	.29466*	.07773	.001	.1057	.4836
			2	-.12963	.08848	.381	-.3465	.0872

Education Average	Scheffe	1	2	-.27977*	.05417	.000	-.4138	-.1457
			3	-.33842*	.05417	.000	-.4725	-.2044
		2	1	.27977*	.05417	.000	.1457	.4138
			3	-.05864	.06195	.640	-.2119	.0947
		3	1	.33842*	.05417	.000	.2044	.4725
			2	.05864	.06195	.640	-.0947	.2119
	Tamhane	1	2	-.27977*	.04623	.000	-.3928	-.1668
			3	-.33842*	.04539	.000	-.4495	-.2273
		2	1	.27977*	.04623	.000	.1668	.3928
			3	-.05864*	.00983	.000	-.0831	-.0342
		3	1	.33842*	.04539	.000	.2273	.4495
			2	.05864*	.00983	.000	.0342	.0831

Table 13: Multiple Comparisons

Dependent Variable		(I) V1	(J) V1	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Adaptability Average	Scheffe	1	2	-.66961*	.06738	.000	-.8363	-.5029
			3	-1.05294*	.06738	.000	-1.2197	-.8862
		2	1	.66961*	.06738	.000	.5029	.8363
			3	-.38333*	.07705	.000	-.5740	-.1927
		3	1	1.05294*	.06738	.000	.8862	1.2197
			2	.38333*	.07705	.000	.1927	.5740
	Tamhane	1	2	-.66961*	.06547	.000	-.8286	-.5107
			3	-1.05294*	.05294	.000	-1.1826	-.9233
		2	1	.66961*	.06547	.000	.5107	.8286
			3	-.38333*	.03852	.000	-.4799	-.2867

		3	1	1.05294*	.05294	.000	.9233	1.1826
			2	.38333*	.03852	.000	.2867	.4799
Profitability Average	Scheffe	1	2	-1.00347*	.06954	.000	-1.1756	-.8314
			3	-1.06250*	.06954	.000	-1.2346	-.8904
		2	1	1.00347*	.06954	.000	.8314	1.1756
			3	-.05903	.07952	.760	-.2558	.1378
		3	1	1.06250*	.06954	.000	.8904	1.2346
			2	.05903	.07952	.760	-.1378	.2558
	Tamhane	1	2	-1.00347*	.05919	.000	-1.1482	-.8588
			3	-1.06250*	.05824	.000	-1.2051	-.9199
		2	1	1.00347*	.05919	.000	.8588	1.1482
			3	-.05903*	.01055	.000	-.0855	-.0326
		3	1	1.06250*	.05824	.000	.9199	1.2051
			2	.05903*	.01055	.000	.0326	.0855

The mean difference is significant at the o.05 level.

The main purpose of the research is to analyze the variables of different sectors. Therefore, the differences in each sector for each variable are analyzed one by one.

Table 14: Analysis of the difference in Location and Settings

	V1	N	Subset for alpha = 0.05	
			1	2
Scheffe[a,b]	1 Food	68	3.7794	
	3 Service	36		4.0741
	2 Retail	36		4.2037
	Sig.		1.000	.369
Means for groups in homogeneous subsets are displayed.				
a. Uses Harmonic Mean Sample Size = 42.698.				
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.				

Above table shows the differences between each sectors namely food, retail and service sectors in terms of benefits gained from UFRAD about location and settings. This result confirms H1.4. H2.4 and H3.4. weren't confirmed since there were no differences in retail and service sectors.

Table 15: Adaptability Average

	V1	N	Subset for alpha = 0.05		
			1	2	3
Scheffe[a,b]	1	68	3.9471		
	2	36		4.6167	
	3	36			5.0000
	Sig.		1.000	1.000	1.000
Means for groups in homogeneous subsets are displayed.					

a. Uses Harmonic Mean Sample Size = 42.698.
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.

Above table shows the differences between each sectors namely food, retail and service sectors in terms of benefits gained from UFRAD about adaptability. This confirms H2.2 and H3.2.

Table 16: Profitability Average

	V1	N	Subset for alpha = 0.05	
			1	2
Scheffe[a,b]	1	68	3.8125	
	2	36		4.8160
	3	36		4.8750
	Sig.		1.000	.722
Means for groups in homogeneous subsets are displayed.				
a. Uses Harmonic Mean Sample Size = 42.698.				
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.				

Above table shows the differences between each sectors namely food, retail and service sectors in terms of benefits gained from UFRAD about profitability. This confirms H1.3 and doesn't confirm H2.3. and H3.3.

Tablo 17: Education Average

	V1	N	Subset for alpha = 0.05	
			1	2

Scheffe[a,b]	1	68	4.4363	
	2	36		4.7160
	3	36		4.7747
	Sig.		1.000	.589
Means for groups in homogeneous subsets are displayed.				
a. Uses Harmonic Mean Sample Size = 42.698.				
b. The group sizes are unequal. The harmonic mean of the group sizes is used. Type I error levels are not guaranteed.				

Above table shows the differences between each sectors namely food, retail and service sectors in terms of benefits gained from UFRAD. The reason for the difference is that franchisees get training from franchisors and UFRAD in order to establish their businesses and for self-improvements.

This appears still seen as the main variable in the franchise area of influence reflected on the contract on the structured training about the company that the franchise food industry as well as the siting variable. H1.1. is confirmed, H2.1. and H3.1. not verified.

LIMITATIONS OF THE RESEARCH AND CONCLUSION

Franchising system has been spreading for the last twenty-three years in our country. Franchisors and franchisees have different approaches to franchise business and meet at a common denominator and collaborate. Another feature that makes the franchise system easier is based on the idea of doing business without risk.

Franchising system also offers competitive advantage such as promotional benefits and advantages and advertising. It also makes important contribution to the national economy and offers quality and affordable goods and services. Consumers also tend to move towards franchises with the expectation of quality and affordable goods and services.

From the entrepreneurs' point of view, factors moving franchisees towards franchising system are the factors that move them open their own businesses. In terms of the franchise business, the factors moving them towards opening businesses in national and

international markets are the same factors that motivate them to become a member of UFRAD Franchising Association.

This Study was conducted to analyze the factors that motivates Franchisees, Franchisors to franchise system and to become a member of UFRAD Franchising Association. According to the literature review conducted, the factors are branding and promotion, publicity, making use of marketing methods, design features, service delivery quality, technology, advertising advantage, distribution advantage, competition, profit and profitability, support, system, friendly supply chains, elimination of establishment risks, national and international growth and development.

This result in today's global world that branding, advertisement are important competitive factors. Therefore, businesses and entrepreneurs in our country should carefuly analyze those factors. As a result of this analysis policy makers should consider those factors and make policies on branding. Branding businesses increase their market share at home and abroad in the future hence add value to national economy.

As a result of the research, it is seen that food sector which is more institutionalized differ from other sectors in terms of location, education and profitability. The reason that adaptability differs for each sector can be seen at the results of the research.

As for it is known that this is the first study on emphasizing the importance of associations in franchising. As a result of this study, institutionalization that is seen in food sector is a necessity for other sectors. The research results can be used UFRAD to give right advisements in this regard. The research in question, has put a new perspective to franchising.

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SUBMISSION INSTRUCTIONS

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