ELECTRONIC LETTER OF GUARANTEE FOR BANKING SYSTEM

Sherif Kamel Hussein[1] , Abdullah Alhayan[2]

[1]Department of Communications and Computer Engineering October University for Modern Sciences and Arts, Giza- Egypt
[1]Head of Computer Science Department, Arab East Colleges for Graduate Studies, Riyadh, KSA
[2]Master of Computer Science, Arab East Colleges for Graduate Studies, Riyadh, KSA

ABSTRACT

Guarantees are generally used to cover the risk of a contracting party failing to fulfill its agreed obligations (such as non-payment or delivery). Collateral can be used in open account trading as it complements collection efforts and documentary credits. A guarantee is a type of protection that one party imposes on the other party in a transaction in the event that the second party fails to fulfill its obligations according to predetermined specifications. In this case, the first party receives a predetermined amount of compensation from the guarantor, while the second party is required to return the payment. This paper provides an in-depth analysis of the areas of automating bank guarantees in electronic form and provides a comprehensive analysis of all procedures and processes related to bank guarantees management.. Through this service, suppliers will be able to issue the bank guarantee electronically and conduct all operations related to the management of the bank guarantee without need to visit the bank, which contributes to increasing operational efficiency, eliminating fraud and contributing to digital transformation. This service will also contribute to reducing costs and limiting waste of time and effort. It will also allow the beneficiaries to easily follow up all related operations, including extension, cancellation, liquidation and confiscation of guarantees without the need of human intervention.

KEYWORDS

Letter of Guarantee (LG), Electronic Letter of Guarantee (eLG), Saudi ArabiaMonetaryAgency (SAMA), Business to Government(B2G), Business to Business (B2B), Issuance, Release,Amend, Confiscate.

1. INTRODUCTION

Saudi Arabia biding and procurements law and bylaw have established specific regulations on the use of the different types of bonds in government procurement process. The terms and conditions of different bond types used in government procurement were stated by Saudi Arabia Monetary Agency (SAMA) and are not subjected to negotiation or change. All bonds submitted by suppliers to government agencies as part of the procurement process shall adhere to the standard LG text stated by SAMA. Two other important definitions are the Applicant or Requester defined as the entity or individual who requested to issue the guarantee and the Beneficiary defined as the entity or individual who the guarantee was issued in favor of. There are many other cases were LGs are used. Below are some definitions of the most commonly used LG types:

- **Bid Bond**: ensures that the bidder submits realistic bids and deters the bidder from rejecting to perform, in case the contract is awarded to them. Otherwise, the bond will be confiscated and paid to the beneficiary.

- **Performance Bond**: ensures that the supplier delivers the contracted services and/or products according to the contractual obligations, under the awarded contract. Otherwise, the bond will be confiscated and paid to the beneficiary.
- **Advance Payment Bond**: ensures that the supplier receiving an advance payment will return the received advance payment if the agreement under which the advance was made cannot be fulfilled. Otherwise, the bond will be confiscated and paid to the beneficiary.
- **Zakat Bond**: A Zakat & Income Tax bond is issued in favor of the Department of Zakat & Income Tax as a security against non-payment of outstanding income tax, penalty for delays and legal Zakat.
- **Customs Bond**: A customs surety bond is issued in favor of the Department of Customs as a security against non-payment of the importer's custom dues.

Saudi Arabia biding and procurements law and bylaw have established specific regulations on the use of the different types of bonds in government procurement process. The terms and conditions of different bond types used in government procurement were stated by Saudi Arabia Monetary Agency (SAMA) and are not subjected to negotiation or change. All bonds submitted by suppliers to government agencies as part of the procurement process shall adhere to the standard LG text stated by SAMA. Two other important definitions are the Applicant or Requester defined as the entity or individual who requested to issue the guarantee and the Beneficiary defined as the entity or individual who the guarantee was issued in favor of.

1.1. Current Situation

Currently, most applicants who would like to issue LG for any reason have to visit their banks and request an LG over the bank counter; however, some banks provide this service through their e-channels. On the other hand, beneficiaries interact with the banks regarding the LGs that were issued in their favor using traditional communication methods, either through visits to the bank or through post mails. Currently, most operation performed on the LGs by either the requester or the beneficiary starting from the issuance to the release or confiscate is totally paper-based process (not including the bank internal operations that might be automated paper-less process) and this encounter unneeded effort in addition to risk factors.

1.2. LG Life Cycle

1.2.1. Issuance

The requester or applicant will request an LG from the bank, bank will process the request and issue the LG if the request was accepted, and the requester then will submit the issued LG to the beneficiary.

1.2.2. Release

The beneficiary will release the LG whenever the release conditions are met, partial release is also required in specific cases according to the agreement between the beneficiary and applicant in this case the LG amount gets discounted however, the LG remains active and subjected to all operations permitted for active LGs. The beneficiary can only release an active LG (not expired).

1.2.3. Amend

LG amount or validity can be amended, LG terms and conditions states the amendments permitted for the beneficiary without the requester permission. For example, validity extension. The bank

can respond to a validity amendment request by confiscating the LG and paying its amount to the beneficiary.

1.2.4. Confiscate/Claim

The confiscate process is also known as claim process. The beneficiary has the right to confiscate an active LG whenever the requester fails to comply with the contractual obligations, the bank will respond immediately to the confiscate request and pay the amount to the beneficiary without the requester permission. The beneficiary can only confiscate an active LG (not expired).

1.3. Automated LG initiative

The key objectives of the eLG automation project are:

- Provide a virtual (unified electronic platform) for all entities involved1
- End to end paperless standardized processes and transactions
- Enhancing Service Levels by reducing the overall processing time
- Increasing security in transactions. Authenticated records for Suppliers and LGs

Automated solution (LGS) is aiming to automate the Letter of Guarantee Business-to-Government (B2G) and Business-to-Business (B2B) services. By making the letter of guarantee process totally paperless, digital, and transparent, blockchain technology can assist in transforming it. Due to the blockchain network's security measures, which include permissioned parties like respectable financial institutions, this transparency aids in the eradication of fraud and counterfeiting. With each transaction being recorded in an immutable, auditable ledger that is not held by any central body, this creates a highly secure network for document filing and retrieval. This solution can be considered as a preliminary simulation of blockchain applications in banking technology and needs further study and testing in addition to legal legislation.

Automated solution (LGS) is aiming to automate the Letter of Guarantee Business to Government (B2G) and Business-to-Business (B2B) services. By making the letter of guarantee process totally paperless, digital, and transparent, blockchain technology can assist in transforming it. Due to the blockchain network's security measures, which include permissioned parties like respectable financial institutions, this transparency aids in the eradication of fraud and counterfeiting. With each transaction being recorded in an immutable, auditable ledger that is not held by any central body, this creates a highly secure network for document filing and retrieval. This solution can be considered as a preliminary simulation of blockchain applications in banking technology and needs further study and testing in addition to legal legislation.

2. LITERATURE REVIEW

A bank guarantee refers to a promise provided by a bank or any other financial institution that if a certain borrower fails to pay a loan, then the bank or the financial institution will take care of the losses. The bank will assure the original creditor through this bank guarantee that if the borrower does not meet his or her liabilities, then the bank will take care of them. Bank guarantees are very commonly utilized among business entities. With the help of a bank guarantee, the debtor or borrower or customer will be able to purchase equipment, machinery, raw materials, acquire additional funds, etc. for commercial purposes. Bank guarantees help businesses as creditors will get a proper reassurance that the loan amount will be repaid by the bank if the business is unable to repay the loan entirely on time. To understand the Process of Bank Guarantee, the following steps are followed: First, an applicant will ask for a loan from a beneficiary or creditor. While applying for the loan, these 2 parties will agree that a bank guarantee is necessary. Then, the applicant will

request a bank to provide a bank guarantee for the loan taken from the creditor. The bank guarantee will be taken on behalf of the creditor. The bank will now offer the bank guarantee to the applicant and send a financial instruction to an advising bank. The following section will introduce the review of literature that discusses and deals with the current topic of the research.

2.1. The Economic and Fiscal Benefits of Guarantee Banks in Germany [1]

The researcher shows the importance of German guarantee banks as they aim to close this financing gap. They have been founded as non-profit-oriented private self-help institutions since 1949 to encourage post-war reconstruction in Germany and after the reunification in 1990 in the new German regions. Today, there are 17 guarantee banks operating at the federal state level with a banking status, being owned by banks, insurance companies, and business associations. They support credit (and, to a smaller extent, equity) financing of enterprises and professionals by granting loan (respectively equity) guarantees to the enterprises' main banks (respectively investment firms), backed by counter guarantees (respectively counter securities) from the state. While the guarantee banks and the state cover up to 80% of the risk, the borrowers' main banks (respectively investment firms) bear at least 20% of the risk.The research discusses the effectiveness of this German credit guarantee system compared to credit guarantee schemes in other countries and examines the economic and fiscal net benefits of five out of six guarantee banks in East Germany. The researcher focuses on East Germany (former GDR) where the need for small business loan guarantees is likely to be higher than in West Germany due to weaker economic conditions. Compared to national figures, East Germany has below average productivity, disposable income per capita, employment, and entrepreneurial activities, while the incidence of small firms, insolvency rates, and credit constraints are above average. The methodology followed in the research is to use a cost-benefit analysis to evaluate the investments of the federal and state governments into the guarantees provided through the guarantee banks. In other words, the study mainly aims to provide a comprehensive assessment of the economic and fiscal net benefits of guarantee banks in five of Germany's six new federal states, which formerly formed the communist East Germany. It considers the federal states of Berlin, Brandenburg, Mecklenburg-Western Pomerania, Saxony-Anhalt, and Thuringia, where disposable income per capita, employment, and entrepreneurial activities are still lower than in the old federal states. The researcher uses a large data set from the internal statistics of the five guarantee banks over the period 1991–2015, own surveys of enterprises, and credit institutions using the guarantee schemes as well as multipliers from different macro econometric models to quantify the overall economic and fiscal net benefits.

2.2. The Impact of German Guarantee Banks on the Access to Finance for SMEs [2]

The research is about funding small and medium-sized enterprises (SMEs). Therefore, the researcher gives an overview of the German bank system. A special characteristic for the German universal banks is the fact that it consists of three pillars: commercial banks, cooperative banks and savings banks. Nevertheless, there are also some special banks like mortgage banks or investment companies which operate in a limited banking sector. This is not due to legal restrictions but a voluntarily taken strategic management decision. The pillar of private commercial banks includes the big banks (Deutsche Bank, Commerzbank, UniCredit Bank, Postbank) as well as regional and other private banks (e.g. Sal. Oppenheim & Cie. as private bank) and branches of foreign banks. Whereas big banks operate within the whole country of Germany as well as abroad, regional banks typically operate inside a restricted geographical region within Germany. The second pillar consists of the co-operative banks. The co-operative sector includes the DZ Bank and the WGZ Bank. These two institutions act as central banks for the primary co-operative banks. The basic principle of co-operative banks in the years after their foundation was the principle of self-aid. The aim was to support farmers and artisans by transferring the savings of

members to other members with financial needs. The third pillar is built by the savings banks of which the vast majority are public banks which are held by the public sector like the federal government, states or even cities. They are owned by their communities, counties, administration unions or federal states. Savings banks are bound to the special savings bank laws of their federal state. The main goal of the study is to reveal whether the provision of a guarantee from a German guarantee bank can initiate a learning process on the side of the commercial banks which helps to mitigate existing information asymmetries concerning SMEs, supports the building of a long-term customer-bank relationship and helps to overcome credit restrictions. Therefore, the research follows a mixed methods approach which is quantitative as well as qualitative research methods. For example, to evaluate SMEs that received a guarantee from the guarantee bank a web survey was conducted to reach a relatively large number of respondents within a short period of time and ensure the highest anonymity possible. Also, semi-structured interviews with bank managers were conducted to learn about their thinking and behavior in SME lending and the reasons for including a guarantee from the guarantee bank in a bank loan.

The research findings have demonstrated that guarantees from guarantee banks are useful instruments when the risk-bearing ability of a bank would normally not allow the provision of a loan.

2.3. The Importance of Bank Guarantees in Modern Business (Business Environment in Serbia) [3]

The researcher shows the importance of bank guarantees especially in modern business in Serbia. In contemporary international payment transactions, there takes place the frequent use of bank guarantees as collateral payment in commercial transactions. The bank guarantee is usually required when it comes to specific business agreements that require stronger commitment and assurance that all contractual obligations will be implemented exactly as indicated. Knowledge of the use of bank guarantees allows better negotiating position in making business, quicker response to the demands of public calls for tenders and the provision of their own claims. Because of its rapid and efficient implementation, the bank guarantee is one of the most commonly used collateral in international business. To prove that, the researcher introduces the appropriate domestic and foreign literature to be the basis for pointing out the connection and mutual dependence of the studied phenomenon, and the source documents, studies, reports, statistical documentation and other sources have been used as the primary basis for the analysis of the importance of the bank guarantee in modern business. In addition to qualitative, quantitative research methodology based on the use and explanation of relevant quantitative data. In this regard, it uses the corresponding quantitative methods, as follows: econometric models and methods and statistical analysis. For clarity of presentation of analyzed issues, different tables and graphs have been used. The results have emphasized on the importance of using bank guarantees as security instruments in modern business especially in Serbia. Modern commodity-monetary transactions are characterized by abundance of subjects, their mutual ignorance and mistrust, as well as a variety of business risks. In these conditions, bank guarantee has affirmed itself as a very important and indispensable mean of security, guaranteeing maximum security for both the beneficiary and the principal in the realization of the contracted transaction.

2.4. The Economic Impact of Credit Guarantees in Jordan [4]

This study aims to provide an evaluation analysis and impact assessment of credit guarantee system in Jordan by focusing on the Jordanian loan guarantee corporation (JLGC) performance. The study has proved that credit guarantees have a positive impact on the Jordanian economy. Also, it emphasizes that the guarantee system is needed with cooperation between all parties of the banking system, Central bank, and JLGC to achieve policy goals. In addition, the study examines

the government's recent initiative in the National Program for Finance and Loan Guarantee to encounter Corona crisis. Recently, the Central Bank of Jordan (CBJ), in cooperation with Jordan loan guarantee corporation JLGC, provided many programs to induce Small and Medium Enterprises (SMEs) in Jordan ability to get needed finance, to grow, and to contribute more to the economy. The results have shown that at the end of the year 2018, JLGC had achieved outstanding guarantees of 4,972 cases with a total value of 109 million JD. Also, the study has exposed how the Jordanian government used credit guarantee as a tool to deal with the COVID-19 crisis. In April 2020, CBJ launched a new special program with JLGC to motivate SMEs lending so they can get their financing needs to pay salaries, finance their operating and working capital, sustainability and development needs. To conclude, the paper concluded the positive impact of JLGC on the Jordanian economy, but it stressed that more emphasis on the guarantee system is needed to achieve policy goals. This needs cooperation between all parties of the banking system, CBJ, and JLGC.

2.5. Guarantees for Green Markets Potential and Challenges [5]

This paper aims to investigate the challenges of investing in low-carbon and climate-resilient technologies and activities or "green market segments") in the Latin American and Caribbean (LAC) region. Also, it explores how guarantees can overcome these challenges through providing various examples of guarantees used in region. First, investments in green market segments face both financial and non-financial barriers, such as long payback periods, high upfront and monitoring costs, lack of collateral, lack of awareness or technical capacity, adverse regulatory environment, legal framework issues and weaknesses of technology providers. Second, the study shows the numerous advantages of credit guarantees. Credit guarantees have existed since the beginning of the 20th century [6]. There are an estimated 2,250 guarantee schemes for SMEs operating in 100 countries worldwide, with a wide variety of setups and structural elements[7].The objective of a credit guarantee scheme is to encourage lenders to provide financing to a specific target group or to increase their exposure to such a group by sharing their credit risk. The objective over the medium to long term is to enable these projects to be financed without a guarantee after the program ends. A study by the World Bank (2009) concluded that credit guarantees are useful instruments where credit risk is perceived to be the key barrier to accessing finance. Also, due to their ability to generate effective leverage, guarantee schemes can be an efficient way to scale up private investment. To conclude, guarantee scheme can be a powerful tool to unlock private investment in green markets if properly designed.

2.6. Performance of Loan and Guarantee Funds in Poland. How Business Model Elements Influence it?[8]

This study mainly aims to evaluate performance of loan and guarantee funds in Poland. The system of small and medium enterprises, which is based on loans and guarantees in Poland, was created 24 years ago. The researcher analyzes the elements of business models that influence the financial performance of researched organizations focusing on value proposition, channels, resources as well as some external factors. To evaluate the financial performance of loan and guarantee funds, the researcher has used data from financial statements for the year 2015 of 59 loan and guarantee funds. The results have shown that the level of the support provided by loan and guarantee funds in Poland is still relatively low. Most of researched funds are liquid but attain very low profitability. In addition, the study finds out a significant positive impact of the width of value proposition, high quality of information channels, amount of resources and partnerships with financial institution on financial performance. In other words, there is a positive effect of partnerships of the funds with financial institutions and high amount/ quality of resources on financial efficiency of funds. Finally, the study has revealed that the level of the support provided by loan and guarantee funds is still relatively low. It consists only 0,5% of the value of bank loans

granted to SMEs on normal conditions. Moreover, the multiplier of guarantee funds is only 1.7. That's why the ability of loan and guarantee funds in Poland to close the capital gap for SMEs is still low.

3. THE NEWLY PROPOSED SYSTEM

Based on the previous literature review, the newly proposed system aims to play a guiding role amongst re-search papers that contribute towards the overall Bank Guarantees. In order to achieve this ambitious goal, the suggestion is to compile a collective perspective on the most prominent problems, and proposed solutions, of the Electronic Letter of Guarantee. There are some significant findings concerning to the Proposed System such as: -

- An electronic platform that provides an integrated solution for all beneficiaries.
- Automating procedures related to guarantees / documentary credits.
- Raise the efficiency of transactions to save time, effort and cost.
- Verify transactions, prevent fraud and ensure information security.
- Unified database of all bank guarantees and credits.
- The possibility of re-engineering and automating procedures internally at banks.

Digital financial services depend more than traditional financial services on customer's confidence in the systems and intermediaries that are used to provide the service. Protecting customers and reducing the risks of their use of the service is essential for building and maintaining trust. Many of these things require service providers to make more investment in their electronic platforms and intermediary networks in order to build a comprehensive digital infrastructure and thus profitable outside the scope of traditional services. The opportunities described above, there are a new set of risks associated with digital financial services. Responding to the emerging and evolving risks of digital financial services requires the preparation and implementation of risk management frameworks - be it for internal procedures and systems, or for intermediary networks facing clients. Service providers should carefully coordinate with their intermediaries and train them regularly in protecting clients. We will rely on our methodology to develop the proposed system on several basic pillars aimed at ensuring the safety of implementation, use and business continuity, including but not limited to.

- A clear and defined scope of work.
- Documented and approved work procedures.
- A system compatible with regular legislation
- System developed according to banking applications.
- Ease of connection and integration.
- Dedicated platform for financial applications.

3.1. Design & Analysis

3.1.1. Functional Requirements

There are three main actors on this system
- Client.
- Organization Employee.
- System Admin (Bank admin).

3.1.2. Non-Functional Requirements

- It's a web-based application.
- The site will be developed in c# and asp.net.
- System must use bootstrap and jQuery.
- The site will SQL Server database.

3.2. Use Case Diagram

Use Case diagram summarize the details of this system's users and their interactions with the system. As studying the requirements, we found this three types of actors, with the cases that they can use the system as shown in figure 1.
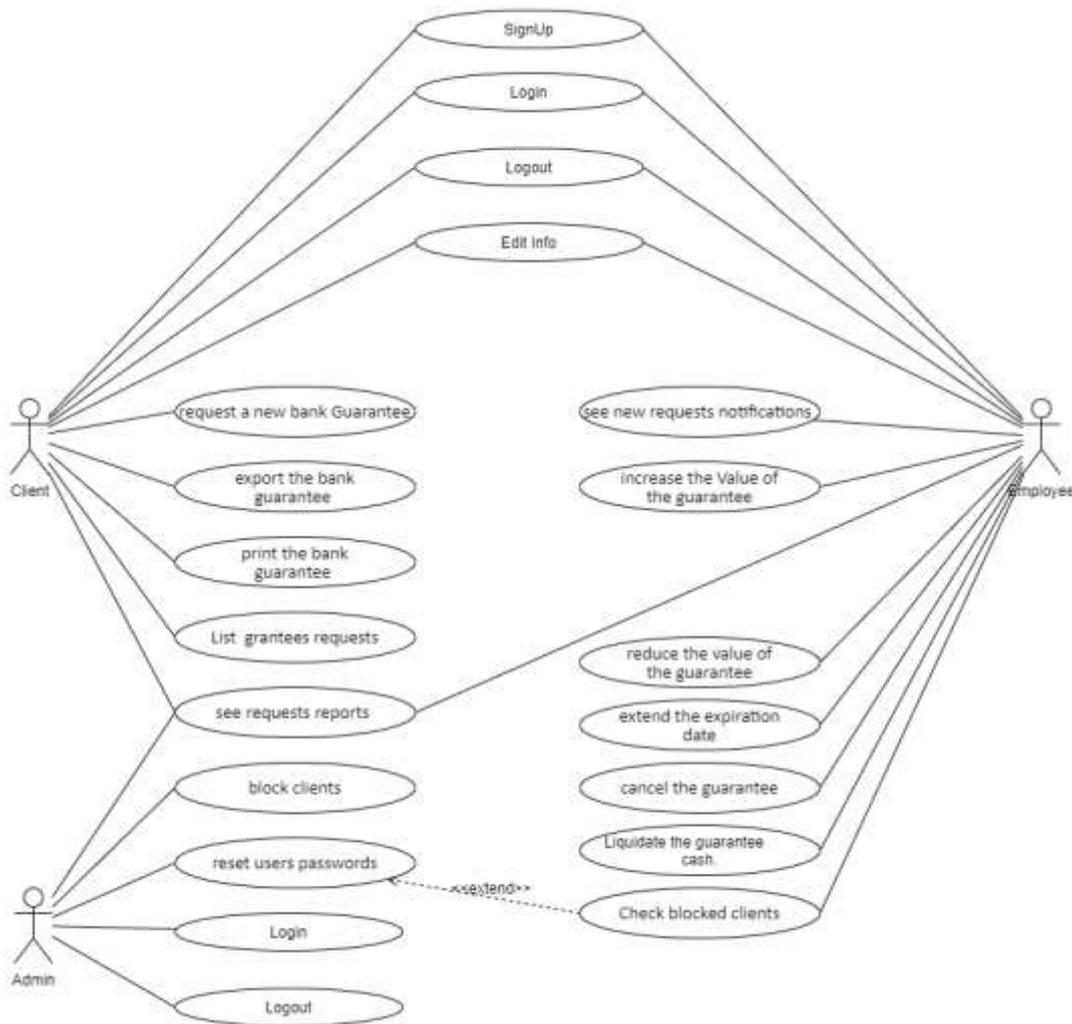

Figure 1: Use Case Diagram

3.3. Entity Relationship Diagram(ERD)

Figure 2 shows the relationships of entity sets stored in a database. An entity in this context is an object, a component of data. An entity set is a collection of similar entities. These entities can have attributes that define its properties.
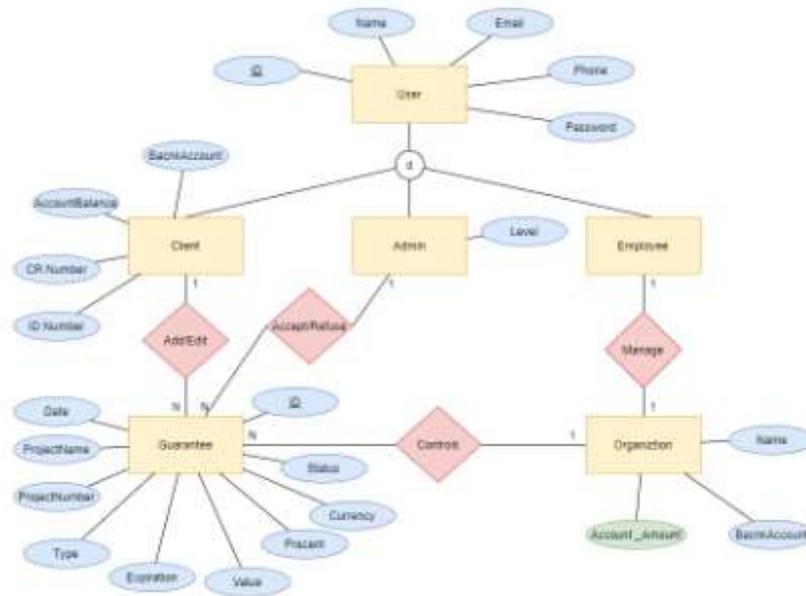

Figure 2: ERD Diagram

3.4. Database Diagram

Every entity on the ERD diagram can be described as a table or view on database as shown in figure 3.
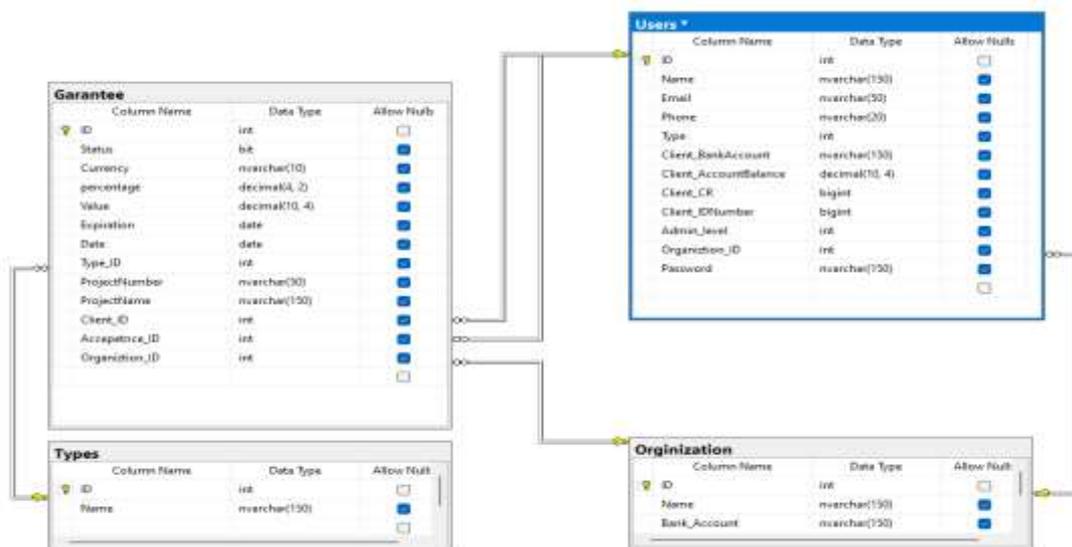

Figure 3: Database View

3.5. Class Diagram

Figure 4 shows different classes that the main tool will create along with their various attributes/variable, functions and the relationships.
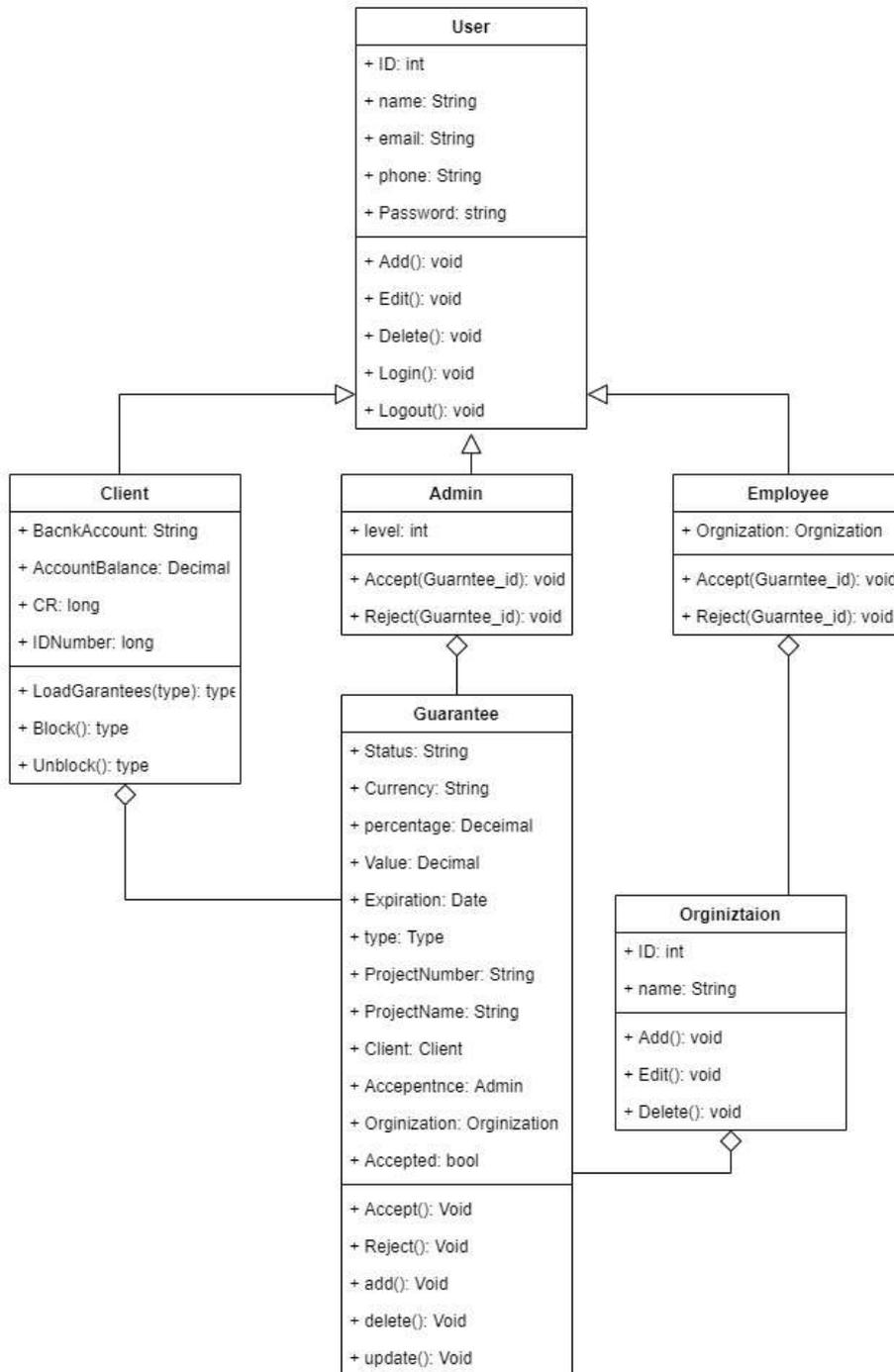

Figure 4: Class Diagram

3.6. Tools and Techniques Used for Proposed System

The system contains tools and techniques as the following:

- Visual Studio.
- MS Visual Studio Code.
- SQL Server 2019.
- jQuery.
- Build the relational database that mirror the whole system.
- Implement a backend (web application) using C# with the aid of ap.net.
- Build the Front-End Application based on native JavaScript and bootstrap templates to show the power of application.
- Extend the system to be useful for the future improvements in business layer or even on application layer.
- Business layer: make it able to be connected to another bank's services.
- Application Layer: make it as a backend for mobile and other device applications on future.

3.7. Implementation

Focus has been placed on the possibility of applying the idea in the field of business, regardless of the technology used. The solution has been implemented with some simple tools and resources, and it is applicable on a larger scale commensurate with the value and importance of the idea.

The system goals will be explored by the following:

- Defining how the information system should be built (i.e., physical system design).
- Ensuring that the information system is operational and used.
- Ensuring that the information system meets the quality standards

3.7.1. Database Class

The class representing the base link between the application and the Database Server will serve the following:

- It provides reading data from database and forms it as we can use.
- It writes any data (Update, Insert and Delete) on the database.

The code representing the Database class :

```
public class database  {

    public static string ConnectionString =
    ConfigurationManager.ConnectionStrings["cn"].ConnectionString;
    public static int Execute(string Qurey)
            {
    }
```

```
public static object ExecuteWithVaue(string Qurey)
{
}
public static DataTable ReadTable(string Query)
{
}
        }
```

3.7.2. Guarantee Class

This class is the core of the system and all system functionality going around it so it has the greatest number of functions. By this class the Guarantees will be managed on system as the following:

- Add Guarantee.
- Delete Guarantees.
- Make Actions (Accept, Refuse, Extend and Cancel).
- Build the html table of all guarantees.
- Get the information of any guarantee we had.

The code representing the Guarantee class:

```
public class Guarantee    {
        public   enum Status { pending=0,accepted=1,refused=2,liquidated=
  3}
            public enum ChangeRequest{
            Increase=1,         Decrease=2,         Extend=3,         Other=4
                    }
            public static int add( string Currency, decimal percentage , d
    ecimal Value
            , string Expiration , string Date, int Type_ID, string ProjectNu
    mber, string ProjectName
            , string Client_ID, int Organiztion_ID)
            {
                object x = database.ExecuteWithVaue("insert into Garantee
    ( Status, Currency, percentage, Value, Expiration, Date, Type_ID, Proj
    ectNumber, ProjectName, Client_ID, Organiztion_ID) OUTPUT Inserted.ID
     " +
                    " values (0,'"+Currency+"','"+percentage+"','"+Value    +
    "  ,'"+Expiration+"','"+Date+"','"+Type_ID+"','"+ProjectNumber+ "','" +
    ProjectName +"','"+Client_ID+", "+Organiztion_ID+")");            retur
    n Convert.ToInt32(x);
            }
            public static int Delete(string id)
            {
                return database.Execute("Delete from Garantee  where id="
    + id.ToString());
            }
            public static DataTable getList()
          { return database.ReadTable("Select * from Garantee;")
```

3.7.3. Organization Class

Organization Class can hold all operations of the organization entity on this system as the following:

- Add New one.
- Edit old Organization.
- Delete Organizations.
- Get Employees of an organization.
- Build the Organization table.

The Code representing the Organization class :

```
public class organization
{
public static int add(string Name, string BankAccount,decimal
banckBalance)
{
object x = database.ExecuteWithVaue("insert into Orginization ([Name]
,[Bank_Account],BankValue) OUTPUT Inserted.ID   values ('" + Name +
"','" + BankAccount + "','"+ banckBalance +")");
return Convert.ToInt32(x);
}
public static int Edit(int id, string Name, string Type)
{
return database.Execute("update Orginization set name='" + Name +
"',Bank_Account='" + Type + "' where id=" + id.ToString());
}
public static int Delete(int id)
{
return database.Execute("Delete from Orginization  where id=" +
id.ToString() );
}
public static DataTable getList()
{
return database.ReadTable("Select * from Orginization");
}
public static DataRow Get(string id)
{
DataTable r = database.ReadTable("Select top 1 * from Orginization
where id=" + id.ToString());
if (r != null & r.Rows.Count > 0)
    return r.Rows[0];
return null;
}
public static string GetName(string id)
{
DataTable r = database.ReadTable("Select top 1 * from Orginization
```

```
                where id=" + id.ToString());
                if (r != null & r.Rows.Count > 0)
                    return r.Rows[0]["name"].ToString();
                return null;
                }
                public static string buildTable()
                {
                DataTable dt = getList();
                if (dt == null)
                    return "NOTHING";
                string s = "<table class='table table-hover table-dark'> ";
                s += " <thead><tr><th scope='col'>#</th>" +
                    "<th scope='col'>Name</th>" +
                    "<th scope='col'>Bank Account</th>" +
                    "<th scope='col'>Bank Balance</th>" +
                    "<th scope='col'  class='noprint'>Option</th>" +
                    "</tr></thead>";
                s += "<tbody>";
                for (int i = 0; i < dt.Rows.Count; i++)
                {
                    s += "<tr>";
                    s += "<th scope='row'>" + (i + 1).ToString() + "</th>";
                    s += "<td>" + dt.Rows[i]["name"] + "</td>";
                    s += "<td>" + dt.Rows[i]["Bank_Account"].ToString() + "</td>";
                    s += "<td>" + dt.Rows[i]["BankValue"].ToString() + "</td>";
                    s += "<td  class='noprint'><div class='row noprint'>";
                    s += "<a href = '/Organization/edito.aspx?ID=" +
                dt.Rows[i]["id"].ToString() + "' class='btn btn-success a-btn-slide-
                text'><i class='fa fa-pencil' aria-hidden='true'></i></a>";
                    s += "<a href = '?DeleteID=" + dt.Rows[i]["id"].ToString() + "'
                class='btn btn-danger a-btn-slide-text'><i class='fa fa-trash' aria-
                hidden='true'></i></a>";
                    s += "</div></td>";
                    s += "</tr>";
```

3.7.4. User Class

The Core of using any system is the users, so that it must be ensured that the system performs all services for various users. The user class determines which authorities that the user have in every single function starting from login to sign out. By this class the users will be managed based on their different types (Employee, Client and Admin).
The code representing the User class:

```
        public class organization
        {
        public static int add(string Name, string BankAccount,decimal
        banckBalance)
        {
```

```
object x = database.ExecuteWithVaue("insert into Orginization
([Name] ,[Bank_Account],BankValue) OUTPUT Inserted.ID   values
('" + Name + "','" + BankAccount + "','"+ banckBalance +")");
return Convert.ToInt32(x);
}
public static int Edit(int id, string Name, string Type)
{
return database.Execute("update Orginization set name='" + Name +
"',Bank_Account='" + Type + "' where id=" + id.ToString());
}
public static int Delete(int id)
{
return database.Execute("Delete from Orginization  where id=" +
id.ToString() );
}
public static DataTable getList()
{
return database.ReadTable("Select * from Orginization");
}
public static DataRow Get(string id)
{
DataTable r = database.ReadTable("Select top 1 * from
Orginization where id=" + id.ToString());
if (r != null & r.Rows.Count > 0)
return r.Rows[0];
return null;
}
public static string GetName(string id)
{
DataTable r = database.ReadTable("Select top 1 * from
Orginization where id=" + id.ToString());
if (r != null & r.Rows.Count > 0)
return r.Rows[0]["name"].ToString();
return null;
}
public static string buildTable()
{
DataTable dt = getList();
if (dt == null)
return "NOTHING";
string s = "<table class='table table-hover table-dark'> ";
s += " <thead><tr><th scope='col'>#</th>" +
"<th scope='col'>Name</th>" +
"<th scope='col'>Bank Account</th>" +
"<th scope='col'>Bank Balance</th>" +
"<th scope='col'  class='noprint'>Option</th>" +
"</tr></thead>";
s += "<tbody>";
for (int i = 0; i < dt.Rows.Count; i++)
{
s += "<tr>";
s += "<th scope='row'>" + (i + 1).ToString() + "</th>";
s += "<td>" + dt.Rows[i]["name"] + "</td>";
s += "<td>" + dt.Rows[i]["Bank_Account"].ToString() + "</td>";
s += "<td>" + dt.Rows[i]["BankValue"].ToString() + "</td>";
s += "<td  class='noprint'><div class='row noprint'>";
s += "<a href = '/Organization/edito.aspx?ID=" +
dt.Rows[i]["id"].ToString() + "' class='btn btn-success a-btn-
slide-text'><i class='fa fa-pencil' aria-hidden='true'></i></a>";
s += "<a href = '?DeleteID=" + dt.Rows[i]["id"].ToString() + "'
class='btn btn-danger a-btn-slide-text'><i class='fa fa-trash'
aria-hidden='true'></i></a>";
```

```
s += "</div></td>";
s += "</tr>";
```

4. RESULTS

The system has proven tangible success and great effectiveness in the speed and safety of banking procedures related to the automation of bank guarantees, in a way that supports the digital transformation plan through the continuous development of the services provided and the employment of modern technologies which contributes to shortening the time and effort of all concerned parties. As well as ensuring complete confidentiality of bank transactions.

Add Organization

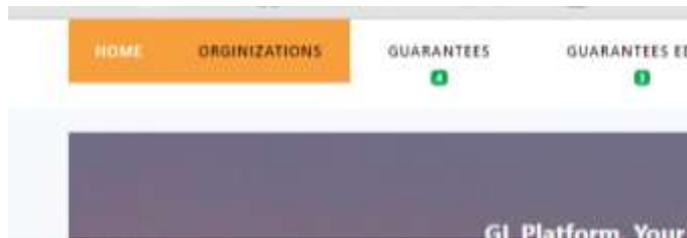- Press on Organization link on nav baras shown in Figure 5.

Figure 5: Add Organization- Step 1

- Press on Add new organization in organization page as shown in Figure 6.
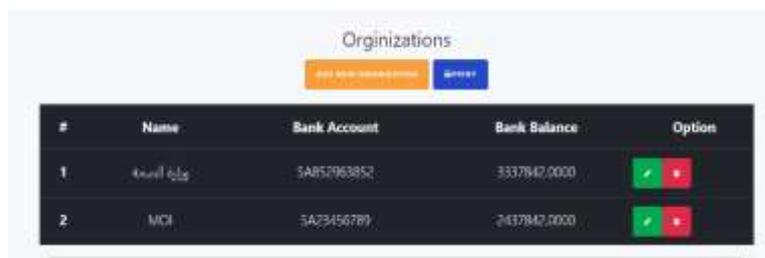

Figure 6: Add Organization - Step2

Add Organization Employee

- Fill employee info and must select his organization and press add as shown in Figure 7.
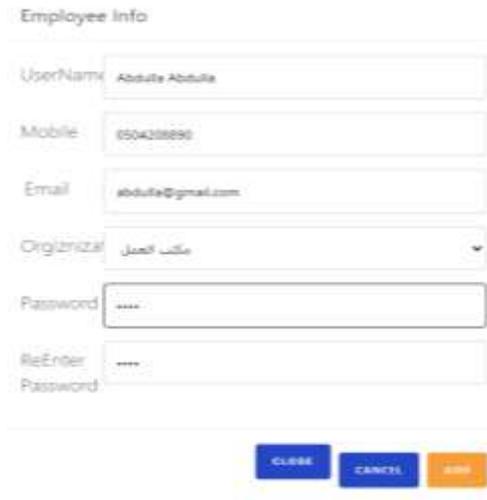
Figure 7: Add Organization Employee

Add Guarantee

- Fill Guarantee Information as shown in Figure 8.

Figure 8: Add Guarantee

5. CONCLUSION & FUTURE WORK

While the role of information technology is now well known, banking technology, if followed in the right way, can provide more quality services, providing important opportunities towards a more sustainable and resilient national economy. The move to automate all processes related to bank guarantees will lead to more economic growth, making digital societies a role model. Policymakers and stakeholders must focus on the future, not just their short-term interests, and act on this transformation now. Currently, most applicants who would like to issue LG for any reason have to visit their banks and request LG over the bank counter; however, some banks provide this

service through their e-channels. On the other hand, beneficiaries interact with the banks regarding the LGs that were issued in their favor using traditional communication methods, either through visits to the bank or through post mails. Through proposed system it will be possible to provide the following benefits: -

- Provide a virtual (unified electronic platform) for all entities involved.
- End to end paperless standardized processes and transactions.
- Enhancing Service Levels by reducing the overall processing time.
- Increasing security in transactions. Authenticated records for Suppliers and LGs.
- Automate the Letter of Guarantee Business to Government (B2G) andBusiness-to-Business (B2B) services.

With the development and expansion of foreign trade between countries and the diversity of its sources, Letter of Credit was found as a means to facilitate the process of importing goods and paying their prices without resorting to direct methods between the seller and the buyer, which sometimes requires providing full financing to pay the value of the goods, and here comes the role of financial institutions in playing the role of mediator between the seller and the buyer and sometimes the financier , by providing the service of accepting the opening of the Letter of Credit. During the coming period, focus will be placed on developing a technical solution that contributes in enhancing international trade among all dealers based on the proposed current solution.

REFERENCES

1. Hennecke, P., Neuberger, D., Ulbricht, D. (2018). The economic and fiscal benefits of guarantee banks in Germany. Small Bus Econ https://doi.org/10.1007/s11187-018-0069-6
2. Valentin, A.(2014). The Impact of German Guarantee Banks on the Access to Finance for SMEs. Edinburgh Napier University.
3. Knezevic, M., Lukic, A.(2016). The importance of bank guarantees in modern business (business environment in Serbia). http://dx.doi.org/10.21511/imfi.13(3-1).2016.07
4. Reham Abu-baker, Mohammad Adeinat. The Economic Impact of Credit Guarantees in Jordan. International Journal of Business and Economics Research. Vol. 9, No. 5, 2020, pp. 288-297. doi: 10.11648/j.ijber.20200905.11
5. Marco Aldana, Isabelle Braly-Cartillier, and Laura Susanne Shuford.(2014) Guarantees for Green Markets Potential and Challenges. Inter-American Development Bank.
6. Bertoldi, P., M. Hinnells, and S. Rezessy. 2006. "Liberating the Power of Energy Services and ESCOs in a Liberalized Energy Market." Proceedings of the Fourth International Conference on Energy Efficiency in Domestic Appliances and Lighting. European Commission DG JRC, Oxford University, and Central European University.
7. Green, A. 2003. "Credit Guarantee Schemes for Small Enterprises: An Effective Instrument to Promote Private Sector-led Growth?" Working Paper 10. Vienna, Austria: United Nations Industrial Development Organization.
8. Halina Waniak-Michalak , Jan Michalak, and Edyta Gheribi.(2018) Performance of Loan and Guarantee Funds in Poland. How Business Model Elements Influence it? University of Lodz, Management Department.