



# Global e-Government Procurement Architecture using Blockchain Technology

Quamrul Hasan, Senior Procurement Specialist, World Bank, Washington DC

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# Presentation Overview

Context

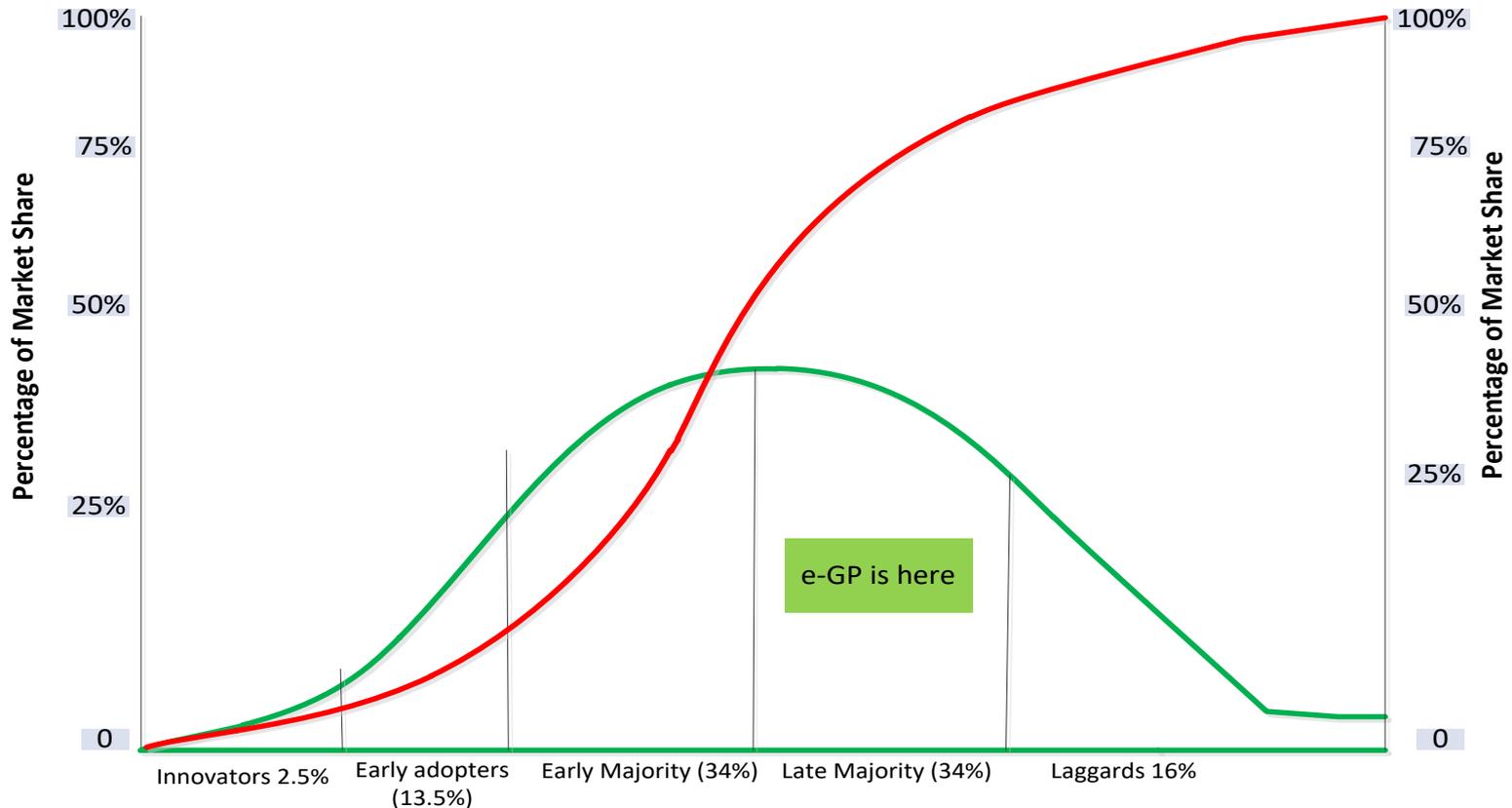
Problem Statement

Development of Global e-GP Architecture using Blockchain

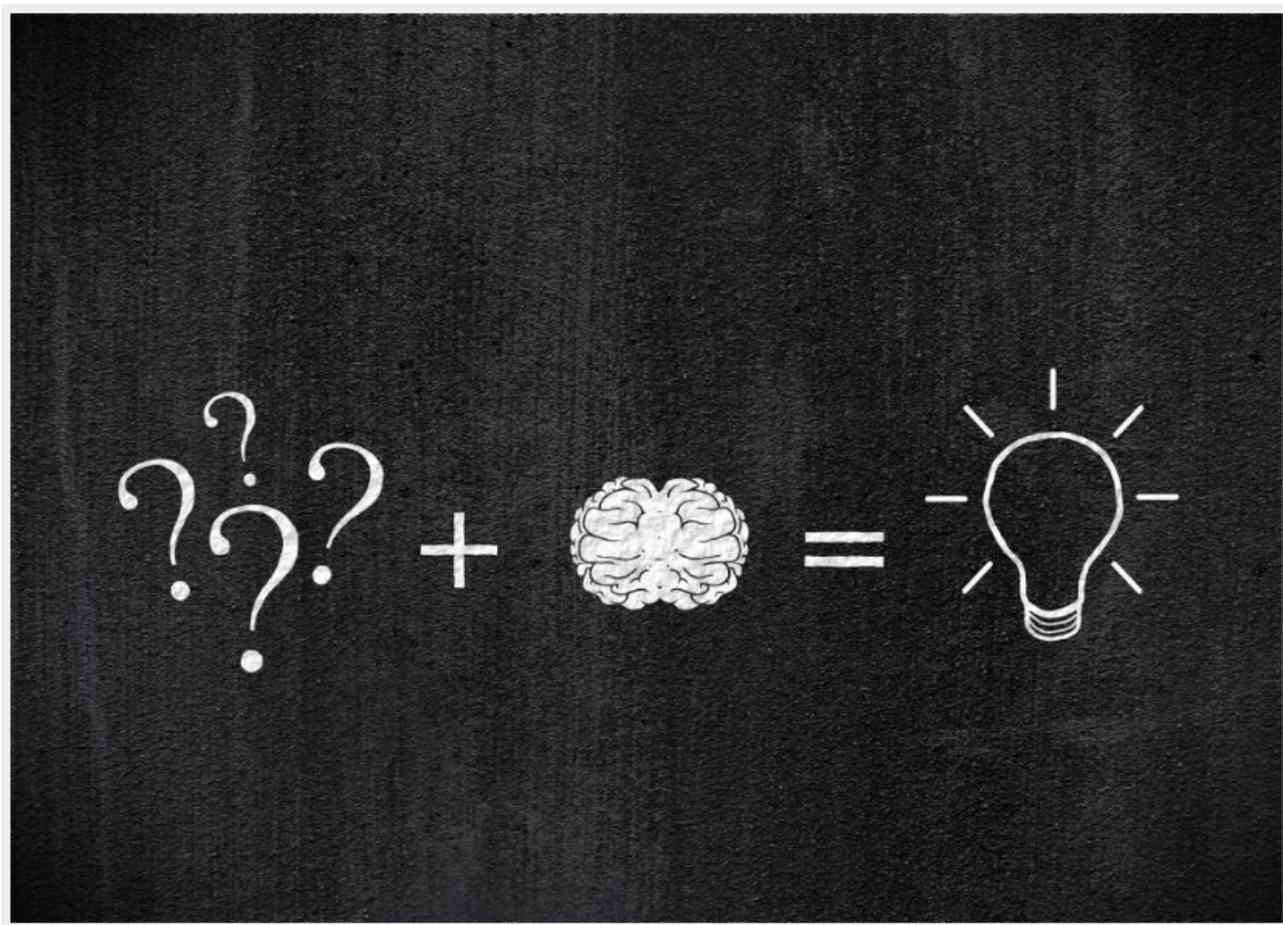
Way forward

# Context..... Diffusion of Innovations Model

Adoption Status of e-GP as on August 2018



Adoption of e-GP will be all pervasive in the near future



**Problem Statement**

# Problem Statement – Key problems

## Verification of Bidders' Experience

- Need to manually verify work experience certificates. Complex in international transactions.
- Lack of a mechanism to interlink award of contracts published online in multiple e-GP systems

## Verifying authenticity of Bank Guarantee

- Though bids are submitted online in e-GP systems, Bidders submit Bank Guarantee in manual format, especially when BG is submitted from a foreign Bank
- Verifying authenticity of Bank guarantees

# Problem Statement – Key problems

## Contract awarded to overloaded supplier

- Supplier already overloaded with work is awarded more contracts

## Verifying the quality of supplier / procuring entity

- Did the supplier execute the work in a timely manner
- Does a procuring entity make payment in time
- Quality rating of supplier / procuring entity

# Vision for the Global e-GP Architecture

To ensure data level interoperability for the development of:

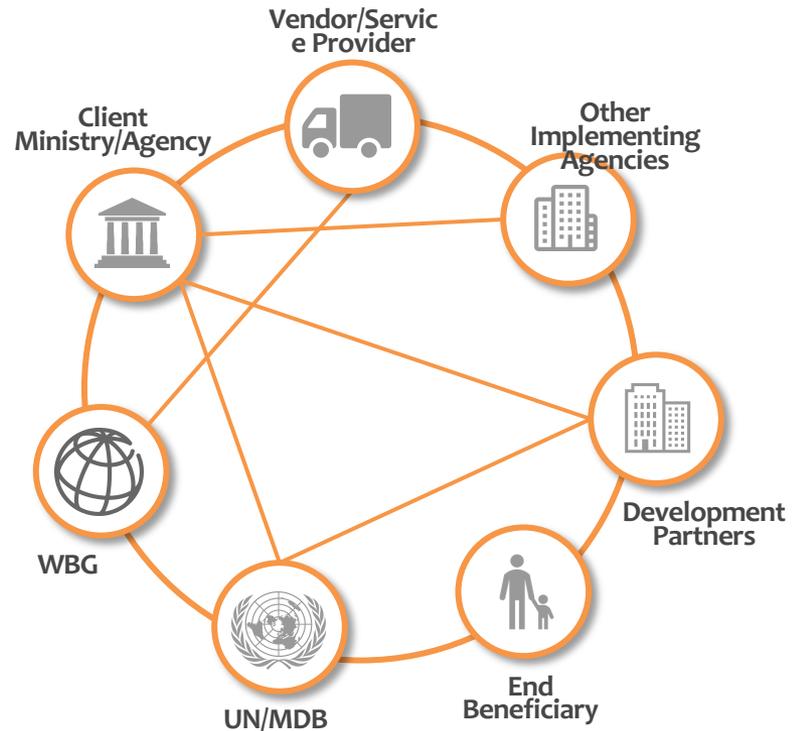
- **A de-duplicated Global Database of vendors**

- **An authenticated Global online repository of vendors' Experiences**

- **E-Performance Bank Guarantees submission in a Distributed e-GP System environment**

# The Value of Blockchain Technology to Establish a Trusted Network

- **IMMUTABILITY:** A **temper-proof shared ledger** where records cannot be changed or removed by adversarial third parties.
- **CONSENSUS:** All network **participants agree on the rules** to create, validate, and accept transactions.
- **TRANSPARENCY:** Network participants own a duplicate copy of the ledger, which ensures them with **real-time access to all transaction data**.



A Shared or Distributed Ledger of e-GP transactions gets developed when e-GP systems publish transaction data in a standardized format confirming to prescribed protocols, which is verified and then added as authentic record in the Shared Ledger based on a de-centralized consensus mechanism.

# Global Identification (GID) of Actors

E-GP Systems

Vendors

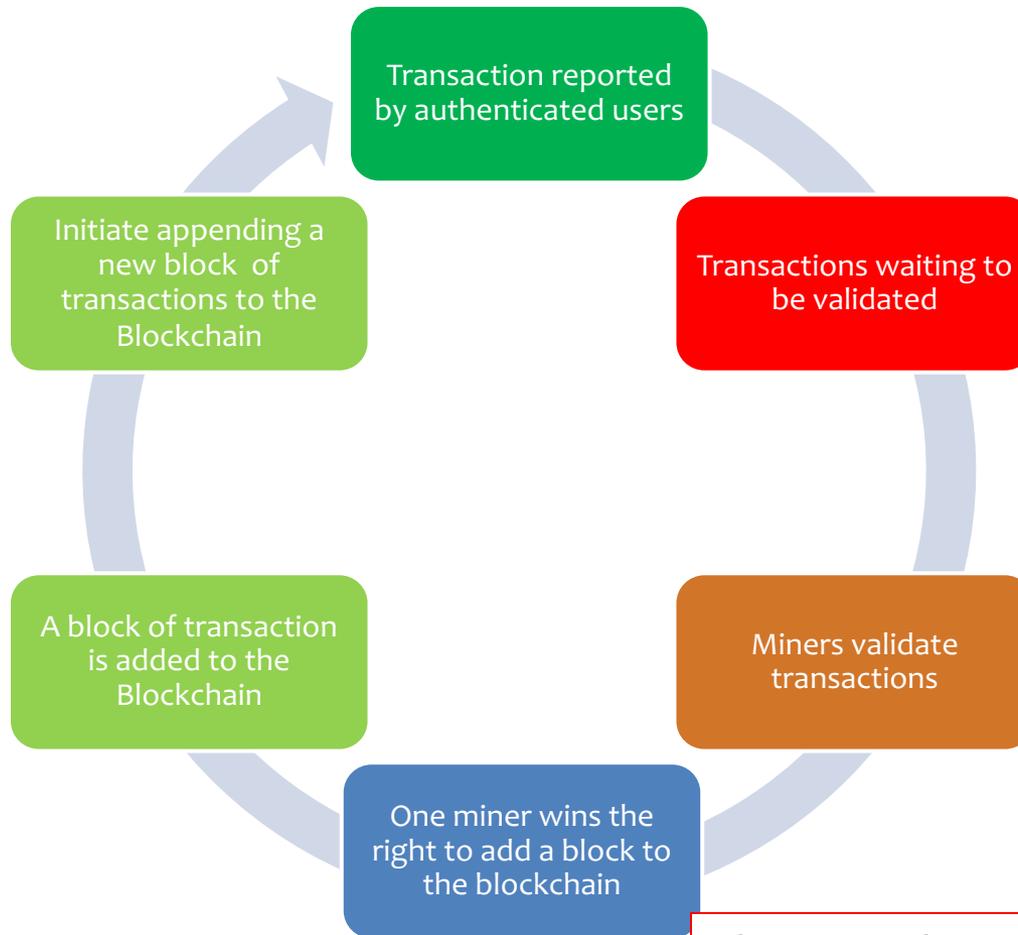
Commercial Banks

It is proposed to build the e-GP Blockchain network on top of the existing couple of hundred e-GP systems located worldwide.

The identity of e-GP systems has to be verified and then a **unique Blockchain Network ID** will be issued.

Each system in the e-GP Blockchain network will be issued a **private-public key pair** generated from a central Public Key Infrastructure (PKI) server established specifically for the Blockchain network.

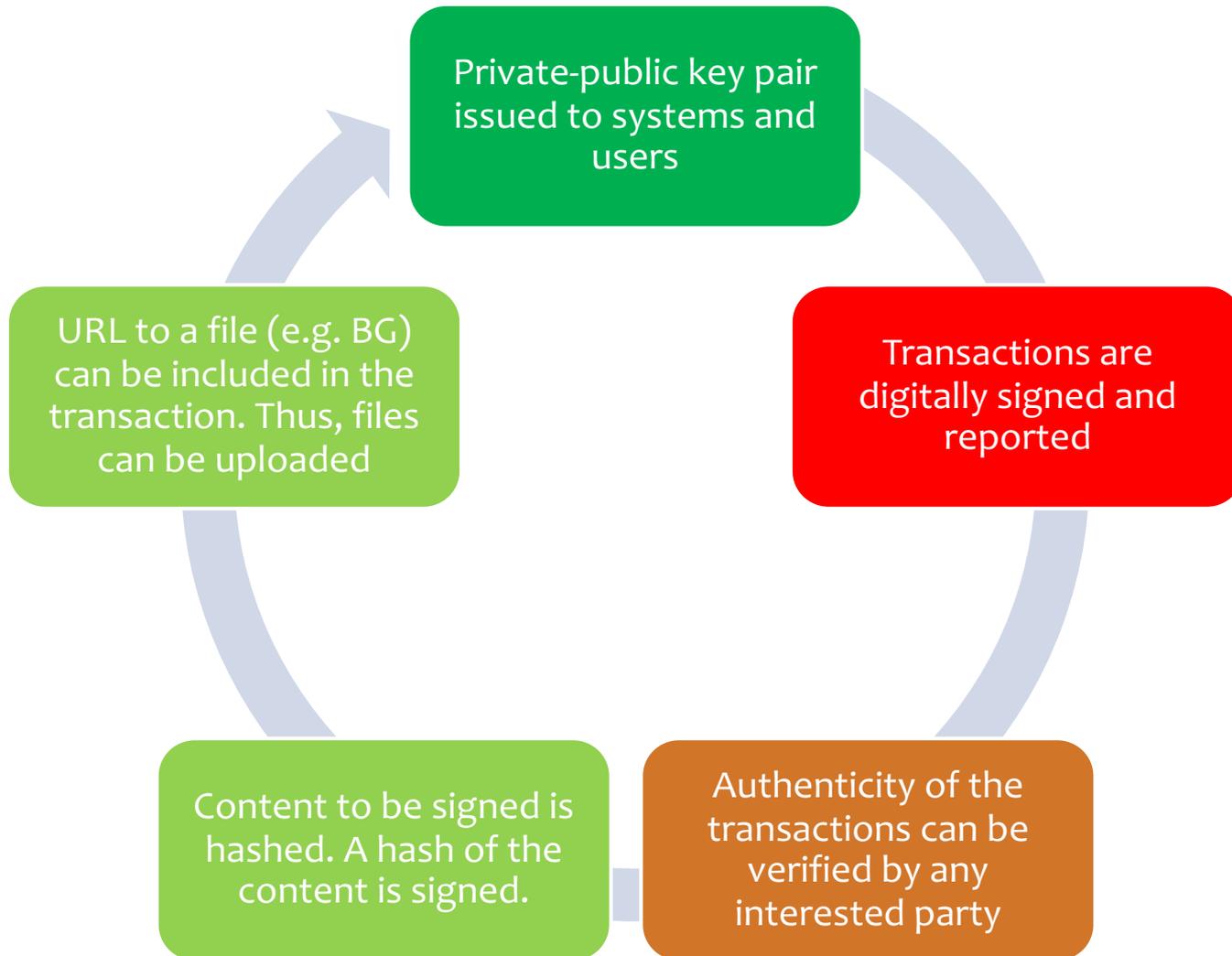
# Blockchain Basics – Creation of a Block



A chain of blocks makes a Blockchain

There can be multiple Blockchains. E-GP Blockchain, Bank Guarantee Blockchain and so on, depending on the transactions reported

# Blockchain Basics – PKI Server



# Supplier GID Creation

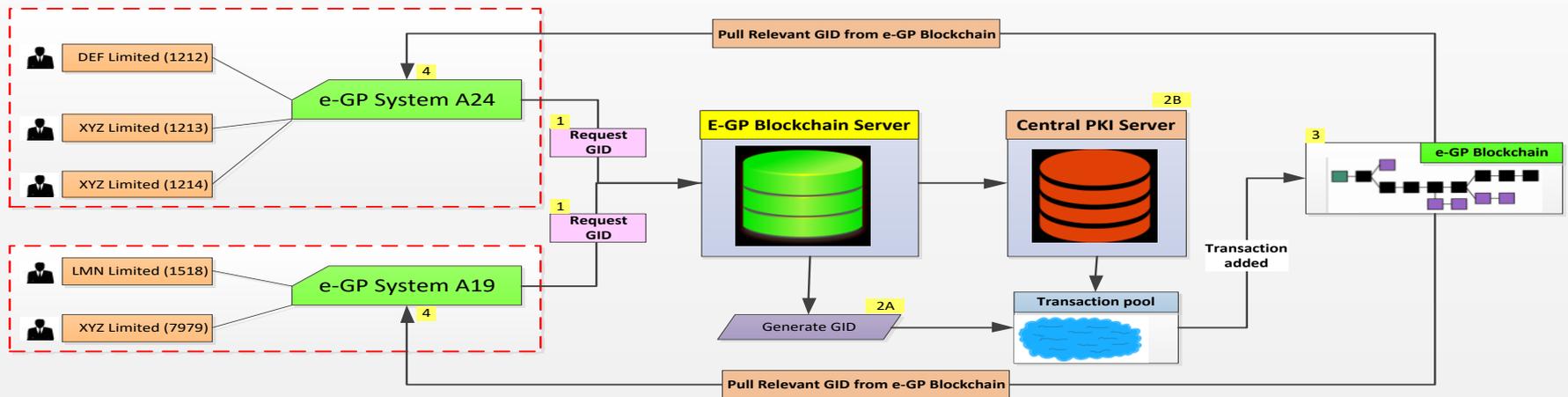
## Overview of Supplier GID Creation Process

GID not created			
e-GP System	Supplier Name	Supplier ID	GID
e-GP System A24	DEF Limited	1212	?
e-GP System A24	XYZ Limited	1213	?
e-GP System A24	XYZ Limited	1214	?
e-GP System A19	LMN Limited	1518	?
e-GP System A19	XYZ Limited	7979	?

XYZ Limited has duplicated Supplier IDs

After creation of GID			
e-GP System	Supplier Name	Supplier ID	GID
e-GP System A24	DEF Limited	1212	54321
e-GP System A24	XYZ Limited	1213	55256
e-GP System A24	XYZ Limited	1214	55924
e-GP System A19	LMN Limited	1518	54627
e-GP System A19	XYZ Limited	7979	54548

XYZ Limited has duplicated GIDs

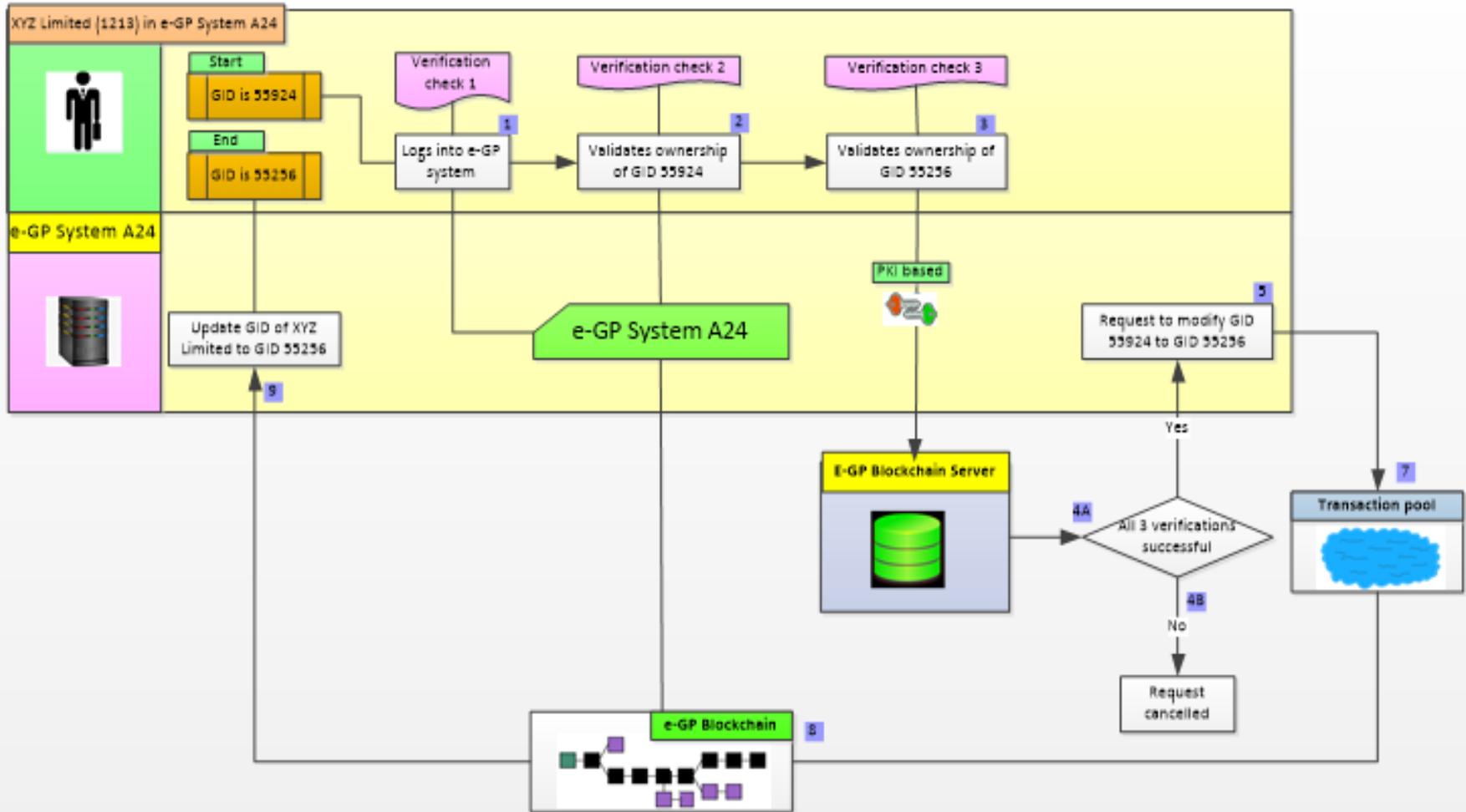


Request for GID creation comes from e-GP Systems

As the e-GP Blockchain server doesn't undertake any verification of user identity, a user with multiple user IDs in the source e-GP system will get a GID for each user ID it has in the e-GP system.

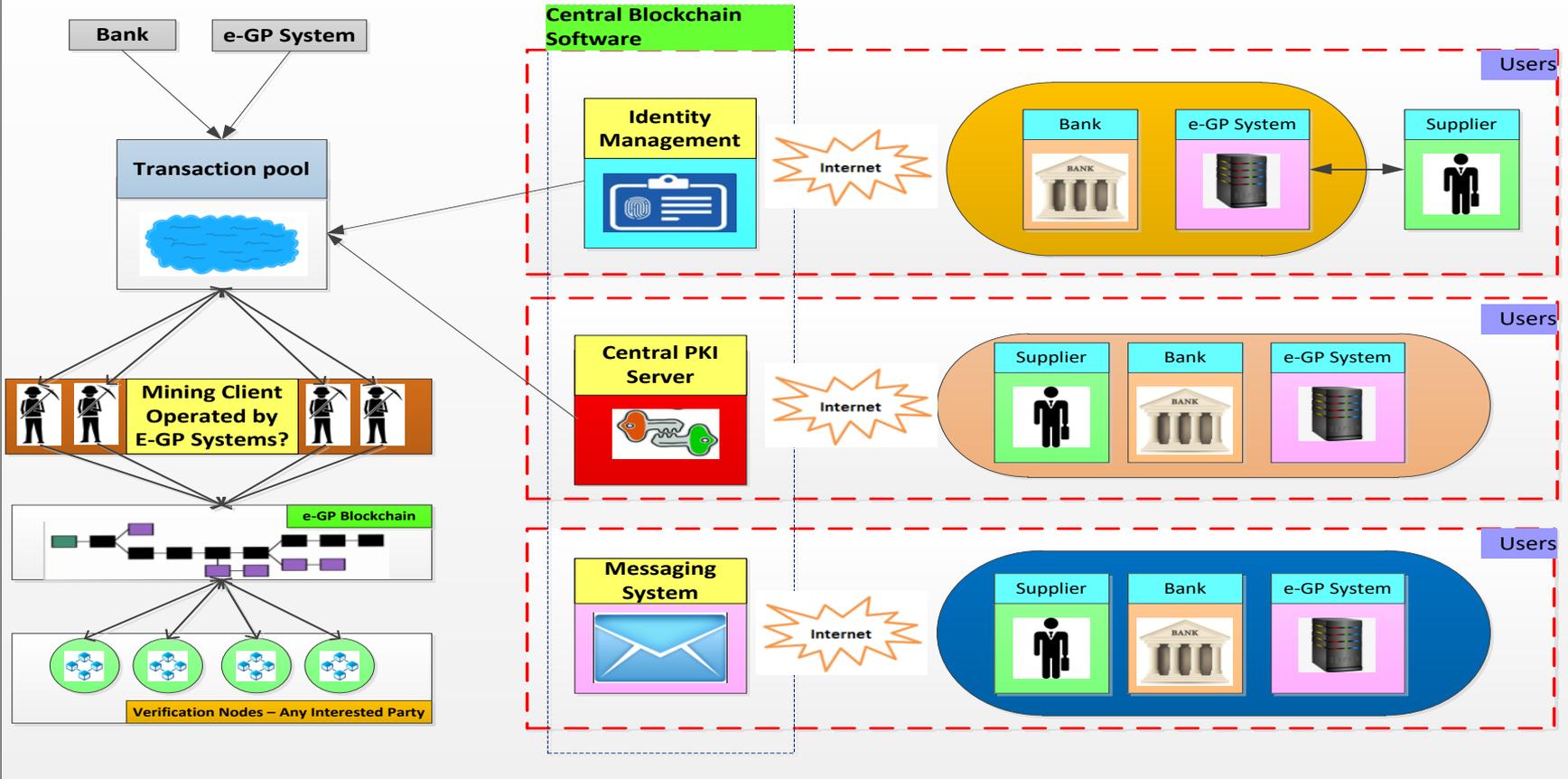
# De-Duplication of GID

## Modification of Supplier's GID



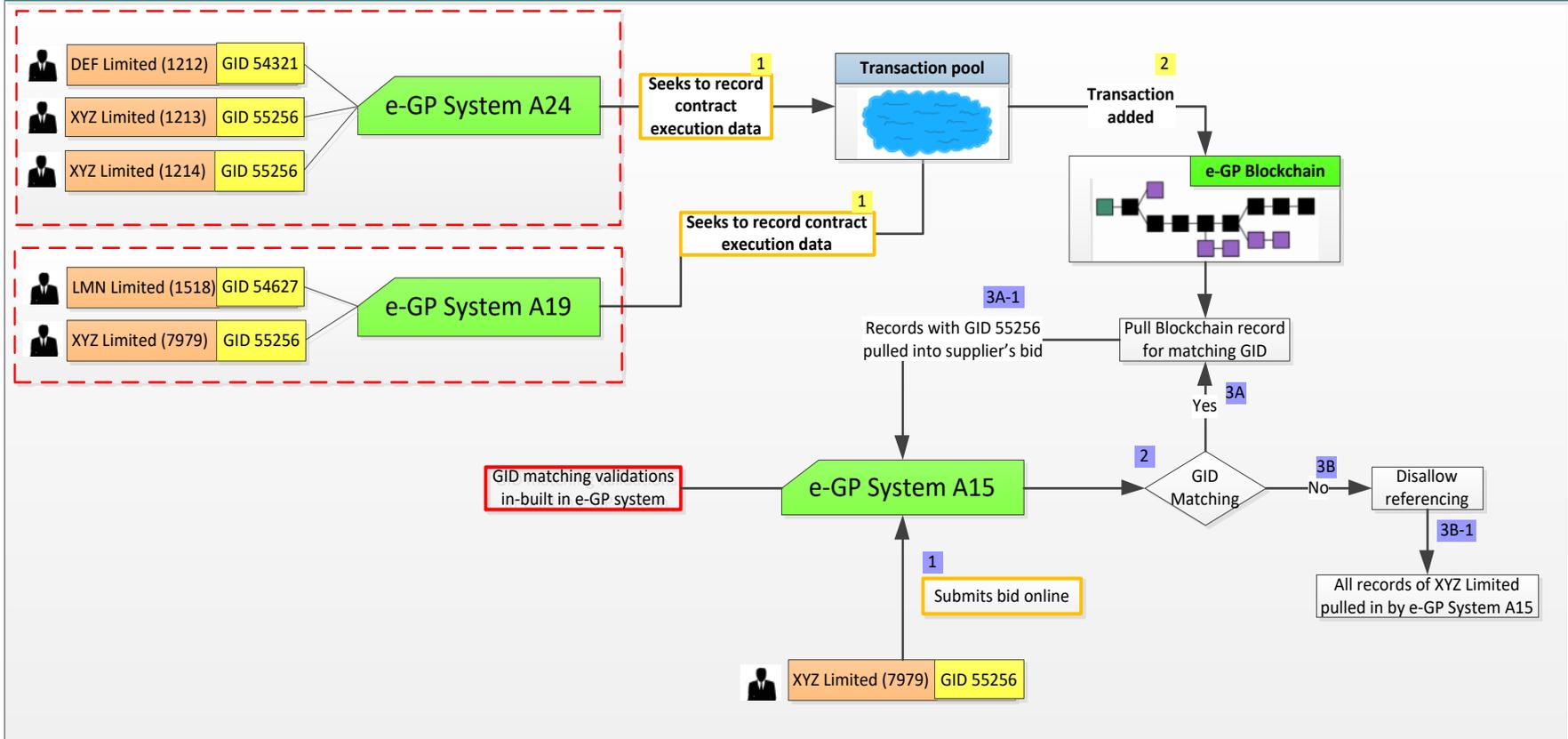
# Overview of the Software Required

## Overview of the Software Required for Operating the e-GP Blockchain Network



# Online Referencing of Work Experiences

## Referencing Contract Execution Transactions in e-GP Blockchain (Post De-duplication)

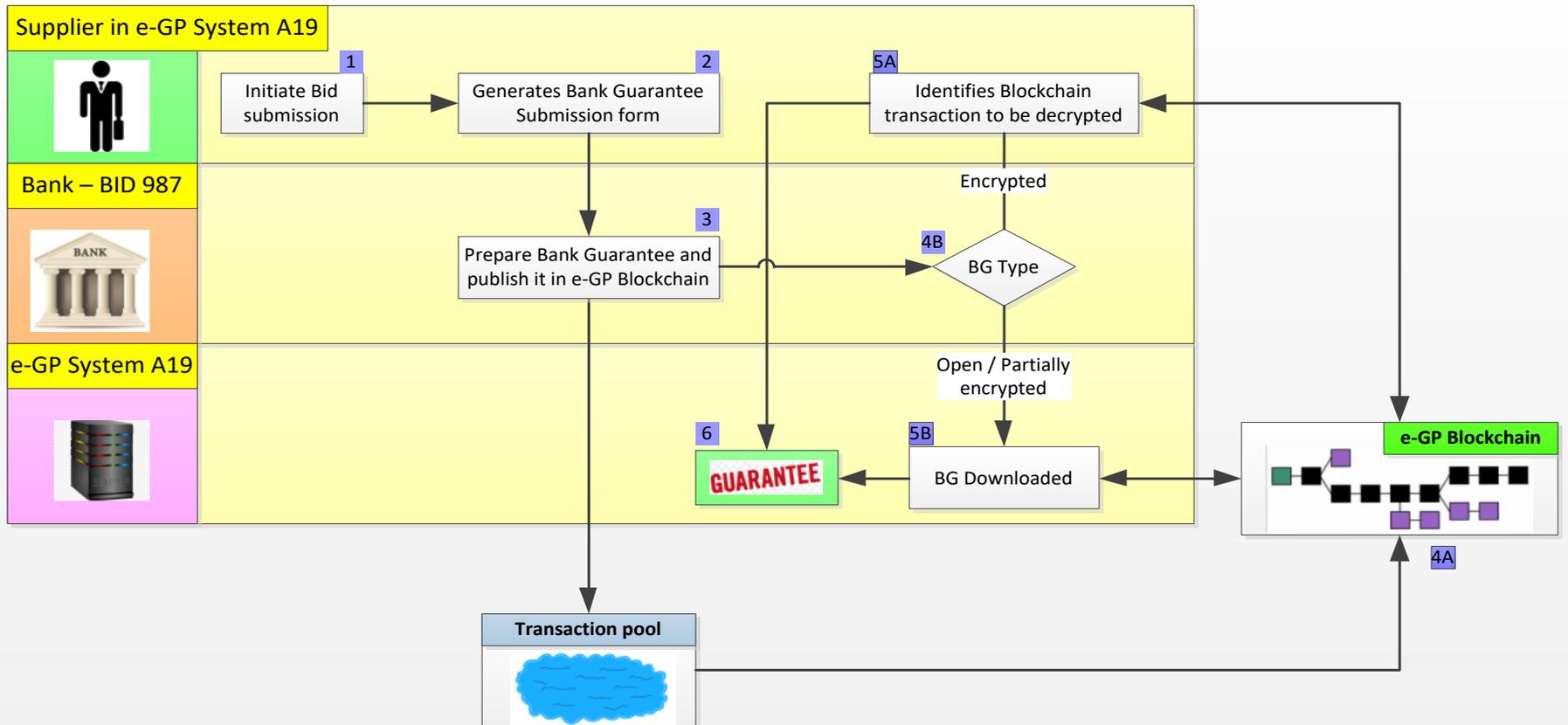


Supplier XYZ Limited is identified by GID 55256 in all e-GP systems. Now the Supplier can pull all its experiences from e-GP Blockchain.

Supplier *de facto* maps all its user IDs to one single GID

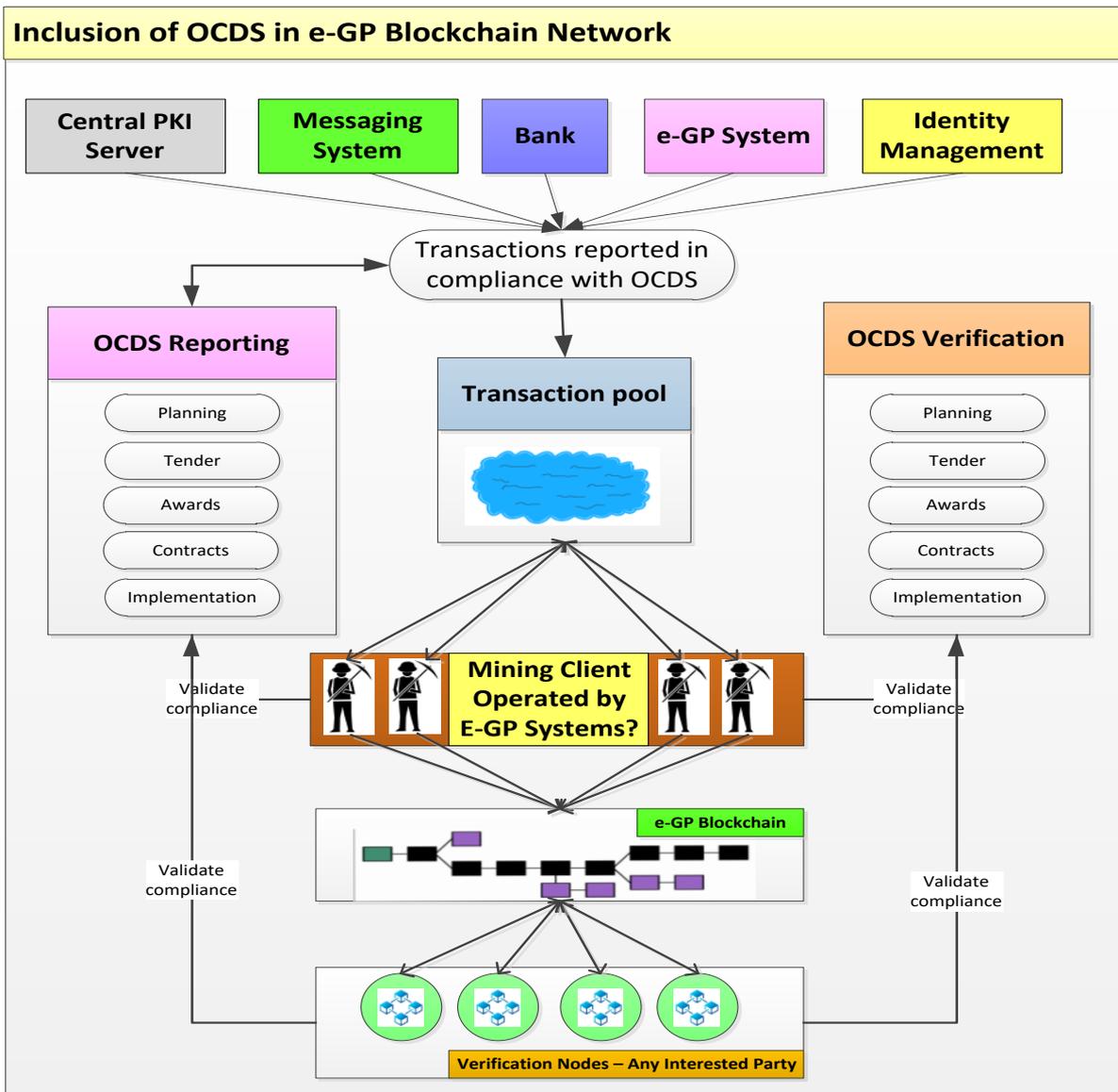
# Online Bank Guarantee Submission

## Authenticated Electronic Bank Guarantee Submission in e-GP Systems using Blockchain Technology



Bank, Supplier and e-GP System are all uniquely identified. It is just a matter of reporting BG as a Blockchain transaction. Note 2 types of BG: encrypted and open.

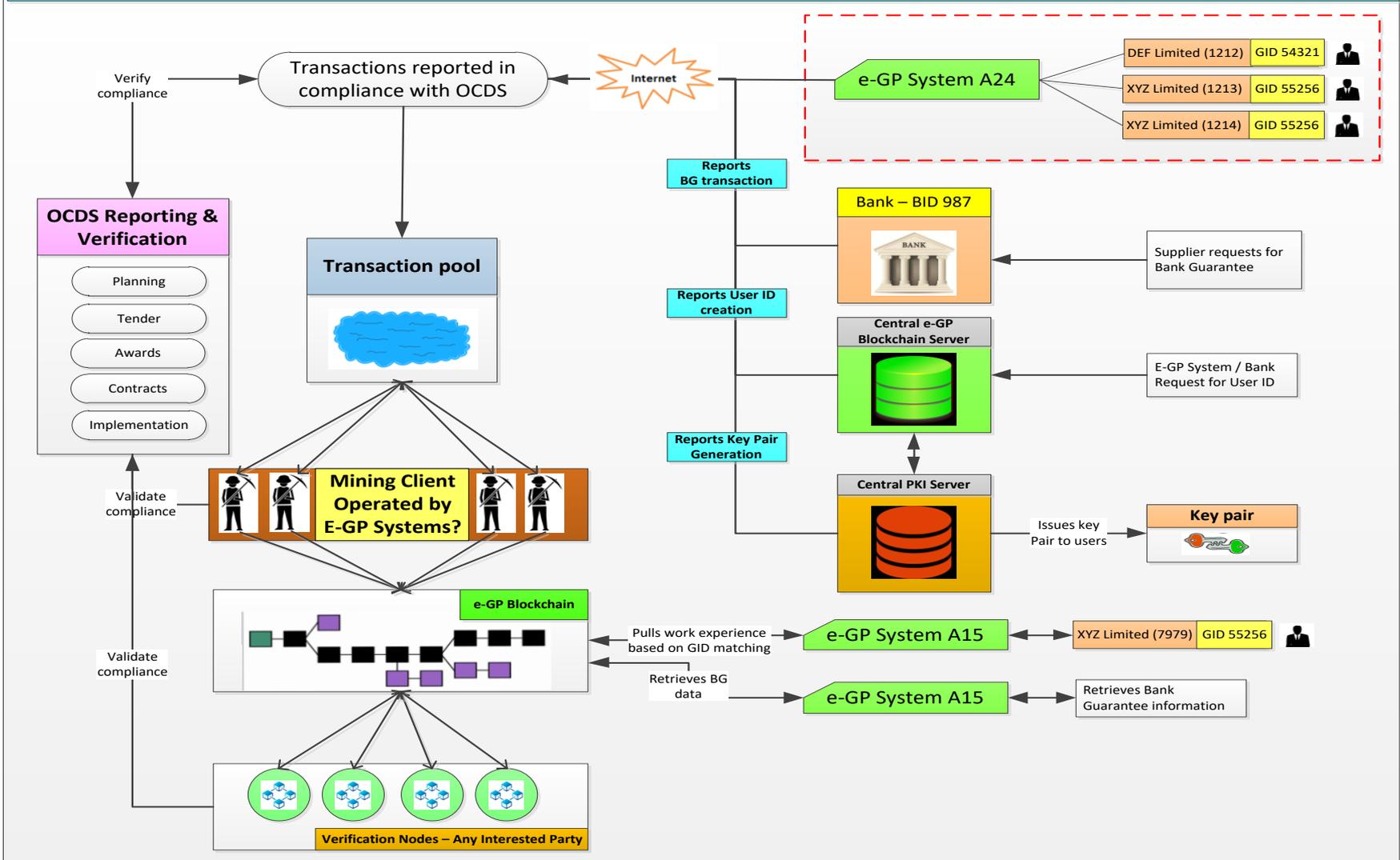
# Synergy between OCDS and e-GP Blockchain



It is proposed to verify transactions reported in the e-GP Blockchain vis-à-vis Open Contracting Data Standards (OCDS)

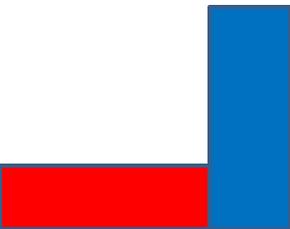
# Full Overview of the e-GP Blockchain Functions

## Overview of the Various Components of e-GP Blockchain Network





# Benefit

- Performance Rating of Suppliers
  - Simplified External IT System Integration
  - Expedited Procurement and Reduced Transaction Costs
    - Real-time view of contracts pending completion, contract award information etc.
    - Online repository of work experience information
- 



**Way Forward**

# Way Forward

Software requirements should be prepared

Establishment of a Governance mechanism

Close coordination with the Open Contracting Group

Development of the solution

Pilot implementation

Global Roll out



[shasan@worldbank.org](mailto:shasan@worldbank.org)  
[ram@gugaservices.com](mailto:ram@gugaservices.com)

THANK  
YOU

