

Business Process Automation with Inter work group transactions

Definition of Inter work group transaction

Every organization consists of several organizational entities. These entities may be geographically distributed across a large campus, across a city or across cities and countries. Similarly an organization may interact for conducting its business with many other organizations.

Transactions which originate from an organizational entity and flow to other entities of the same organization or other organization are called here as Inter workgroup transactions. Each workgroup here is typically characterized by the fact that it has its own database (which contains the data needed for processing the instances of the transactions), and set of 'transactors' or roles who participate in the transactions. The transaction embeds in itself several business rules which are applied when the instance of the transaction is processed in any work group. The business rules and business logic can be different for different work groups for the same transaction as it flows thro the relevant work groups.

Origination of Transactions

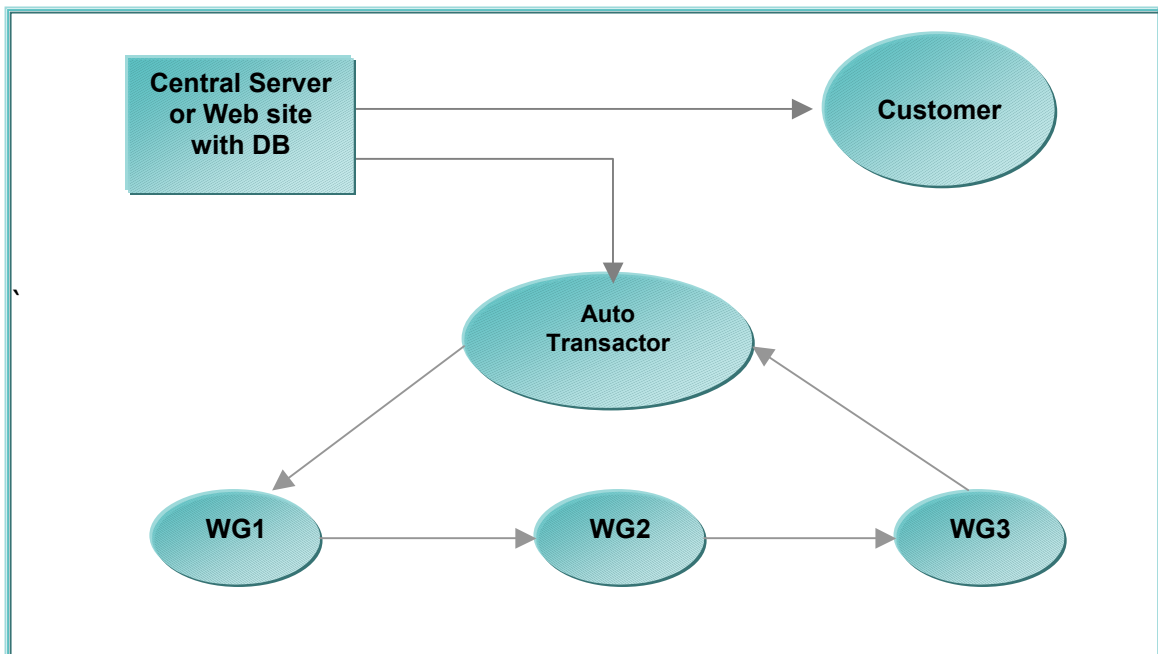
Transactions are performed to satisfy a request of a customer of the organization or to conduct a transaction of the organization itself. The former poses a more interesting situation in that the customer who causes a transaction to originate (i) may interact in person by physically presenting himself/herself at the work group or (ii) interact remotely by using a Telephone or a PC over Internet.

Models of transactions

We define two models of IWG transactions that can occur.

1. Such IWGTs (Inter Work Group Transactions) may occur directly from one WG to another. In this case the instance of the transaction flows from one WG to another over any kind of network such as a MAN, WAN etc. There is a sending transactor and a receiving transactor. The sending transactor is normally a person who initiates the transaction. Typically they are triggered in response to a in-person interaction with a customer.
2. IWGTs triggered indirectly by other inputs. Consider the following situation: an organization sets up a central server which can be accessed by others either by telephone or PC; it could therefore be a web site also. Such accessing entities could be individuals or organizations. They input some data towards a 'service request' (Examples are given later). To process this service request, it may be necessary for certain organizational entities to perform a business process which flows thro one or more of them and returns with the result of the completed process and may update the same central database as feedback to the original requestor.

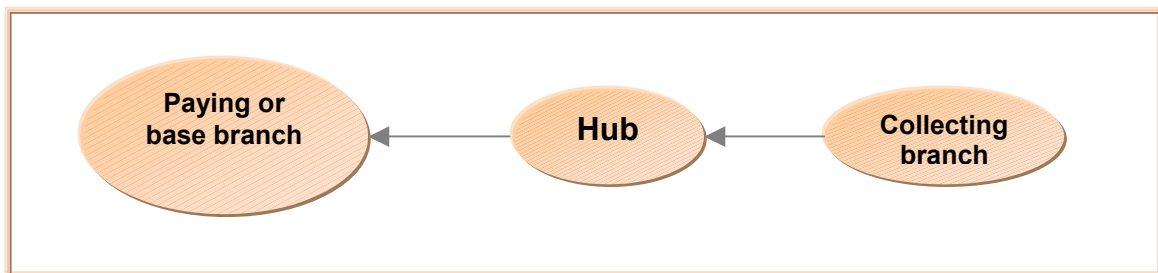
In this scenario, a business process can be initiated automatically (without any human operator or transactor) at the server, collects the input data, determines the work group to which it has to flow next and the IWGT begins its flow.



Examples

Let us look at some examples of such transactions. The first three examples are taken from the banking industry.

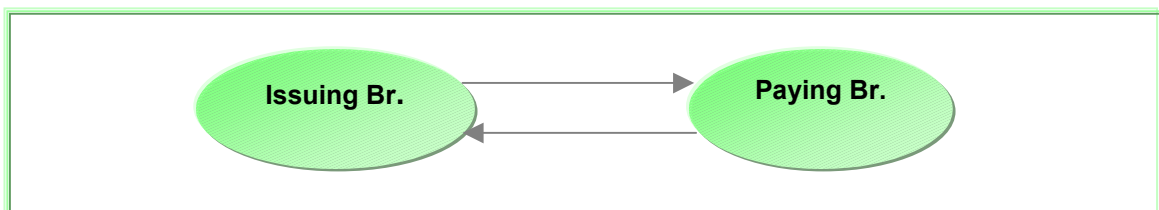
1. Cash Management System



The cheques drawn in favour of an account holder in BB are deposited at the collecting branch. They are cleared here and the credit is sent to the account at the base branch, sometimes thro a Hub to maintain float.

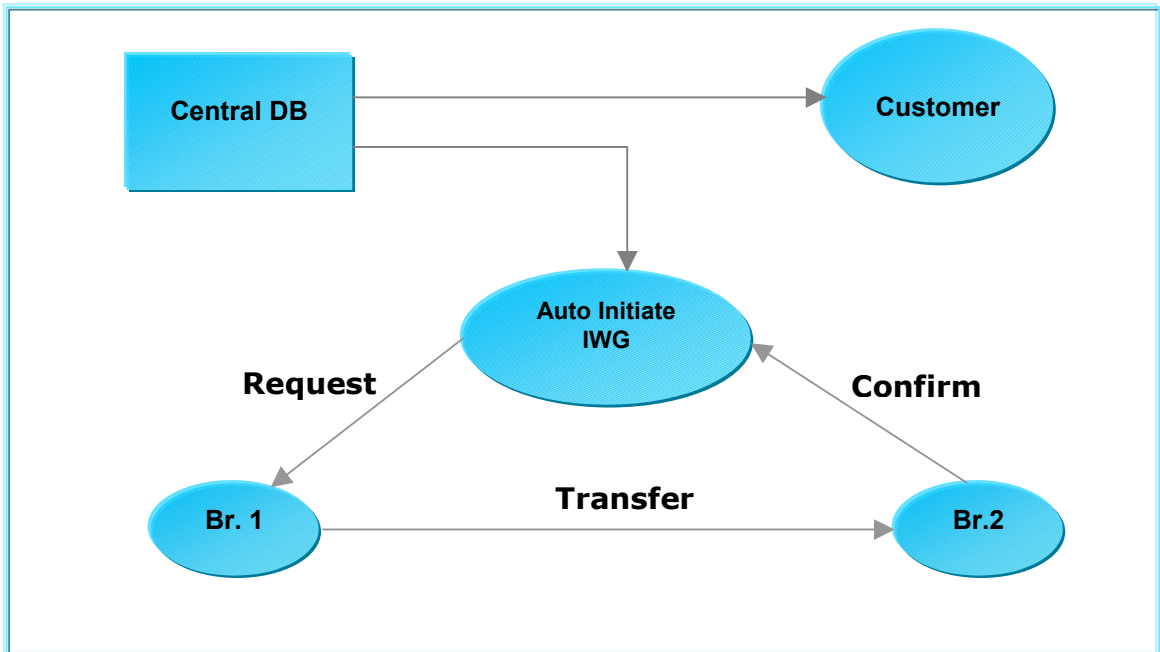
2. Demand Draft

A DD is purchased at a branch, drawn on another branch of the bank (in same or another city) and handed over to the beneficiary. The beneficiary presents the DD thro his bank for clearing. It comes to the Paying branch and is paid.



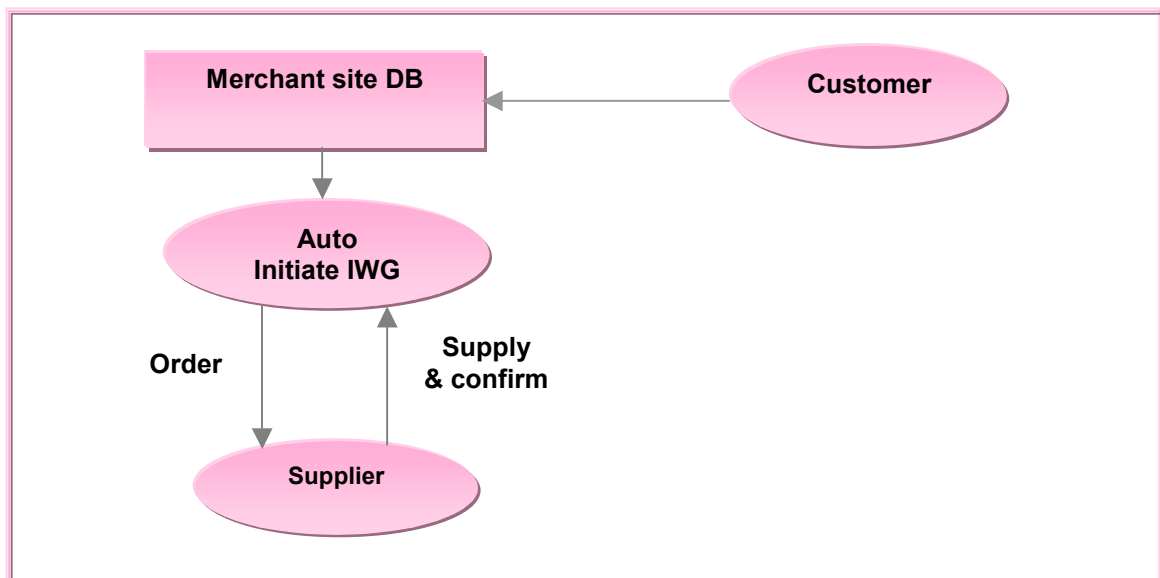
3. Funds Transfer

The customer leaves his funds transfer instruction over a phone or PC. The bank is a multi-branch bank. Funds are to be transferred from one branch to another.



4. Let us look at an example from the e-commerce segment.

A buyer places an order for an item from a Web Merchant. The Merchant site has the requisite details. Now it has to initiate a transaction to the back-end supplier. The supplier full fills the order and confirms to the Web Merchant.



NOTE:

1. In the above models it may be noted that each work group may consist of several Transactors who may participate in the business process or it may be a single Transactor working manually or in auto mode.

- 2. In example 4, extensions are possible to the model, whereby Auto Initiate IWG can originate and send transactions to more than one work group based on some input data.*
- 3. All work groups need not be of the same organization.*
- 4. Each work group will have at least a PC with BPRO IWG software. This can be interfaced to any existing computerized system in that work group.*

Important Issue

In all the above examples an important point to be noted is that in each work group a database exists and the incoming/outgoing transaction has to alter the state of the database based on certain business rules. In many situations the transaction may even have to be returned to the sender with certain data or for requesting more data.

For example, in the first example (CMS), at the collecting branch several validations have to be done on the account holder, instrument number etc and various tables have to be updated for generating clearing related documents. At the Base Branch Accounts have to be updated, commissions have to be calculated etc.

In the second example (DD), at the issuing branch validations have to be done on Instrument number etc and at the issuing branch again validations have to be done on Instrument number, amount etc. Further accounting has to be done at each end.

In the fourth example, at the supplier stocks have to be checked, inventory has to be altered upon supply, amount has to be noted for settlement etc.

This leads to the conclusion that merely sending an unstructured message such as an e-mail to the next work group does not satisfy the business process automation need. All these steps should get linked by an integrated homogenous Inter Work group transaction which uses a structured data exchange mechanism and executes the required business logic at the appropriate work group using that data.

Such a platform has been developed by Datanet and is called **BPRO** – short for Business Process Automation. It can elegantly and efficiently automate business processes within a work group and seamlessly extend it to inter work groups.

Error Recovery and Integrity

There is one key feature of BPRO that will be presented here before presenting more details of BPRO. It will be seen in all the above cases that a transaction has to travel from one work group to another over a network which could be a MAN or a WAN. Given the various points of failure including the system on which the transactions are processed, a robust and automated mechanism is required to recover from failure of a transaction reaching the target work group in a processible form.

In the implementation of Inter Work group transaction in BPRO, the same transaction is defined in all the concerned work groups. The data of the transaction is carried from source work group to the target work group as an e-mail or a file. Please note that e-mail is only a packaging mechanism for the own format in which BPRO creates such data.

To ensure error recovery and integrity BPRO implements a proprietary transaction level protocol called **TCOP** (Transactions Communication Protocol). It does the following:

- Maintains a 'dead' copy (not editable) of the Form with the sending transactor
- When a Form reaches the Transactor of the target workgroup, it automatically generates an 'acknowledgement' and returns the same to the sender
- Upon receiving the 'acknowledgement', moves the 'dead' copy from the sending transactor's pending tray to 'Archive'
- If an acknowledgement is not received within a reasonable expected time, a repeat transmission can be sent using the 'dead' copy.
- If a repeat copy is received by the target transactor and the original had earlier been received, ignores the repeat copy.

Features of BPRO that enable IWGTs

In BPRO every work group is characterized by a Code, a Name and a Class (Branch, Hub etc). The class facility is very useful in modeling the work group and in deciding the business logic that should run in that work group.

In building IWGTs, in every WG, we define the Other WGs with which it interacts by defining its Code, Name, Class, default Transactor to whom the transaction is sent, method of sending—by mail or file etc.

A transaction, after completing the process steps in 'this' work group, gets 'sent' to another work group by specifying the other work group code. BPRO carries the transaction data and makes it a 'pending transaction' at the target work group. This can now get processed (manually or automatically).

An instance of an IWGT can be sent to multiple work groups.

Dispatcher

BPRO has a service called DESPATCHER which does the function of converting transaction data to its format, preparing it for sending to other work group and encrypting and digitally signing with PKI. Similarly it processes all incoming files / mails for the reverse process. It can be configured to run in a completely automated mode. The Dispatcher module is particularly optimized for bulk transactions, that is when several hundreds of transactions are ready to be sent to a given WG.

Form in a wait loop

For automatic processing of transactions – either to initiate a transaction or to process a transaction that has come in, it is possible to write a 'waiting

transaction' in BPRO, which wakes up at specified intervals and checks for certain conditions or looks for pending transactions and acts accordingly.

BAPIs for IWGT

BPRO provides many APIs to developers to interface between BPRO and their application. Some of the key IWG specific APIs are:

Bpro_get_fromwhere
 Bpro_iwg_send
 Bpro_check_despatcher_service
 Bpro_execute_despatcher
 Bpro_form_despatch_state
 Bpro_get_other_wgs_name_code
 Bpro_get_wg_class
 Bpro_is_despatcher_logged
 Bpro_is_dispatch_pending
 Bpro_retransmit_all_unacknowledged
 etc

PKI security

BPRO IWG software comes with a seamlessly integrated PKI based security module (BPRO/SS). The software works completely transparently in normal use. The PKI system is built using Microsoft's CryptoAPI. It uses digital signature and per session key for encryption. BPRO/SS consists of a key certification module also.

Applications

Datanet has developed many applications using this capability and implemented them in leading banks in several hundred work groups or branches. Some of these are Cash Management System, Any Branch Banking for a multi branch bank, Demand Draft transactions, Telebanking and PC banking services etc.

The product can be used for computerizing IWGTs for any application sector.

