

Electronic Office: Zero-code Process Automation in the Google Cloud

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Abstract. *Electronic Office* is a tool which can be used by an organization to automate an unlimited variety of business processes, without having to write a single line of code. The main step in automating a given business process using *Electronic Office* is essentially to identify the process participants, categorized into originators and resource persons. Thereafter, *Electronic Office* enables instantiation of the process in the Google cloud, its workflow through different process participants, and finally its termination, whereupon the process instance gets archived. *Electronic Office* is ideally suited for (i) small and medium businesses that cannot afford the cost of process automation requiring software development, (ii) large corporations and organizations that require automation of business processes having complex, or adhoc, workflows, and (iii) organizations that have already developed, or invested in, the required application software, e.g., ERP, CRM or HRM, and only need to automate the workflow part of their business processes.

Keywords: Business Process Automation, Zero-code Process Automation, Cloud BPM.

1 Introduction

Business process automation is the strategy an organization uses in order to reap one or more of the following benefits:-

- Improved operational efficiency
- Reduced turnaround times
- Consistency of business activities
- Reduced errors
- Reduced operating costs

Automation of a given business process by most, if not all, vendors typically begins with the process model, usually a BPMN model [1], which appears to be a defacto industry standard. The starting model is usually a business-oriented model, i.e., comprehensible by business users of the process. The model is then transformed into an IT-oriented executable model (See Chapter 9 [2]), before beginning to develop

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the software code for automating the process. An alternate model developed by the author [3] directly yields key software artifacts required for process automation.

Most, if not all, business processes comprise of two parts, viz., workflow part, and non-workflow part. In the workflow part, a process instance flows from process participant to one or more other process participants, until one of them terminates the process instance. In the non-workflow part, a process participant with whom a process instance is currently pending performs his / her share of activities which form part of the process. An important point to note is that the software for automating the activities comprising the non-workflow part is usually available in ERP, CRM, HRM, or Financial Accounting systems, being offered by a large number of vendors over the last several decades. Accordingly, the focus of attention in this paper is automation of the workflow part of processes.

2 Electronic Office - Overview

Electronic Office is one part of *Pristine Workflow*, a comprehensive suite of process automation solutions in the Google cloud. (www.pristineworkflow.com, www.elecoffice.com). The aim of *Electronic Office* is to automate the workflow part of business processes, without having to go through the time-consuming and costly step of developing software.

Electronic Office is based on the recognition of two *generic roles* present in all business processes, viz., **Originator** and **ResourcePerson**. A business process instance is always originated by somebody; the person who originates the process instance is playing the generic role of Originator. Once a process instance comes into existence, other roles may come into play; all of these other roles are represented by the generic role, ResourcePerson.

Electronic Office permits parallel workflow; i.e., a process participant can, after performing his / her share of activities,

- 1) create messages which can be viewed by future process participants
- 2) create links to documents, which can be accessed or downloaded by future process participants, and
- 3) send the process instance simultaneously to one or more ResourcePersons, who then receive email alerts.

By default, the process instance also flows back to the Originator. Thus, the Originator can continually monitor the progress of the process instance, and take corrective action under exception conditions. In *Electronic Office*, only the Originator is authorized to terminate the process instance originated by him / her.

3 Premium Products, Inc.

In order to get an insight into how *Electronic Office* enables zero-code process automation, we consider a fictitious corporation, viz., Premium Products Inc.

The Management of Premium Products Inc have decided to automate the *Order To Cash* process. This process comprises of all the activities that are performed from the

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time a Purchase Order is received from a customer, until all ordered products are delivered to, and payment received from, the customer, in accordance with the terms and conditions in the Purchase Order.

The efficient conduct of the Order To Cash Process pertaining to each Purchase Order is the responsibility of either Gary Cooper or Harsh Vardhan, the two Salespersons of the company. Hence, these two employees must be assigned the generic role, Originator, in the Order To Cash Process. Their process-specific role is Salesperson.

Invoicing customers is the responsibility of Lana Turner, the Accounts Officer of the company. It is also her responsibility to debit customers when she invoices them, and credit customers when she receives payment from them. Hence, she must be assigned the generic role, ResourcePerson, in the Order To Cash Process. Her process-specific role is Accounts Officer.

Sarah Connor is the Storekeeper of the company. Whenever a Purchase Order is to be fulfilled, she is the one who has to withdraw the corresponding items from stores, and pass on the same to Spencer Tracey, the Dispatch Clerk. Spencer arranges for transportation of the goods to the customer. Hence, Sarah and Spencer must be assigned the generic role, ResourcePerson, in the Order To Cash Process. Sarah's process-specific role is Storekeeper, while Spencer's process-specific role is Dispatch Clerk.

4 Electronic Office – Zero-code Process Definition

Shown in Figure 1 is the Main Menu of *Pristine Workflow*. The Administration Menu (Figure 2) is accessible by the Administrator (of the organization's *Pristine Workflow* account) by clicking ADMINISTRATION in the Main Menu, then logging in.

Under the **EMPLOYEES** tab of the Administration Menu, *Pristine Workflow* enables defining the employees of the organization; these employees can then become process participants in one or more business processes of the organization. Shown in Figure 3 is the list of employees of Premium Products Inc.

Under the **BUSINESS PROCESSES** tab of the Administration Menu, *Pristine Workflow* enables definition of the business processes of the organization. See Figure 4 for the current list of business processes of Premium Products Inc.

Under the **GENERIC ROLES** tab of the Administration Menu, for each of the business processes, the employees who play the generic roles of Originator and ResourcePerson are identified. See Figure 5 for the lists of Originators and ResourcePersons of the Order To Cash process.

Finally, under the **PROCESS-SPECIFIC ROLES** tab of the Administration Menu, for each of the business processes, the process-specific roles played by various employees can be identified. See Figure 6 for the list of process-specific roles in Premium Products Inc.

5 Electronic Office – Key Features of Workflow

An employee of an organization can instantiate a process, or access a process instance, by clicking ELECTRONIC OFFICE in the Main Menu (Figure 1), and logging in. Note, however, that from among all the employees of Premium Products Inc. listed in Figure 3, only Gary Cooper and Harsh Vardhan can instantiate an Order To Cash process, while each of the 5 employees listed in Figure 5 can access an Order To Cash process instance pending for his / her action.

In order to illustrate key workflow features of *Electronic Office*, we take up an example.

Premium Products Inc. have received a Purchase Order from Redmond General Hospital, viz., PO No. REDGEN-223, for 2 ECG units, viz., 1 unit of Vesta-301i and 1 unit of FX-7102. The total order value is US\$ 3500/-, payable upon full delivery. This PO is being handled by Salesperson, Gary Cooper. Gary has stored a copy of the PO in Google Drive, and has acquired a link to the same.

Gary Cooper clicks ELECTRONIC OFFICE in the Main Menu (Figure 1), logs in, and sees the screen shown in Figure 7. He clicks the button, **INITIATE THE PROCESS**, and sees the screen shown in Figure 8. He selects the Order To Cash Process, then inputs “P.O. REDGEN-223 from Redmond General Hospital” as the process instance identifier, then clicks SELECT, whereupon he sees the screen shown in Figure 9.

In the lower part of the screen in Figure 9, he selects the Storekeeper, Sarah Connor, and writes notes as shown. Notice that Gary has included a link to the Purchase Order (pointed to by a red arrow in Figure 9), copy of which he has stored in Google Drive. He now clicks SUBMIT, whereupon Sarah receives an email alert (Figure 10), indicating to her that she should log into Electronic Office.

When Sarah logs into Electronic Office, she sees the form shown in Figure 11. Notice again the link pointed to by the red arrow, clicking which Sarah can download the Purchase Order REDGEN-223 from Google Drive. Sarah, the Storekeeper, is now expected to withdraw the ordered goods from Stores, hand over the goods to Spencer Tracey, the Dispatch Clerk, enter an appropriate message in the form field in Figure 11, then send the form to Spencer.

In general, whenever a process participant receives an email alert, he / she clicks ELECTRONIC OFFICE in the Main Menu (Figure 1), logs in, and accesses the corresponding process instance. The process instance will present itself as a form similar to Figure 11. The top part of the form will contain messages from previous process participants. The lower part will contain a drop-down menu for selecting zero or more future participants, as well as a field for creating a message for future participants. The message can include HTML content, such as links to documents, images, etc.

Whenever the Originator feels that the objectives of the process have been achieved, he / she terminates the process instance, whereupon the instance goes into archive.

The Administrator can list or terminate current and archived process instances, and view archived process instances, under the PROCESSES INSTANCES tab of the

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Administration Menu (Figure 2). The archived process instance corresponding to the example is shown in Figure 12.

6 Conclusion

Most business processes comprise of two parts, viz., workflow part, and non-workflow part. The software for automating the activities comprising the non-workflow part is domain-specific and is usually available in ERP, CRM, HRM, or Financial Accounting systems. *Electronic Office* is useful for automating the workflow part, without having to incur the time and cost of developing software.

Electronic Office supports parallel workflow, which contributes to improved operational efficiency, since different process participants can play their roles simultaneously. The originator of the process instance can continually monitor its status, and take corrective action under exception conditions.

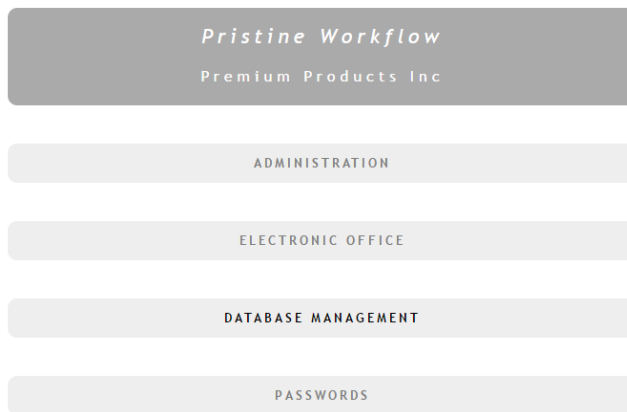


Fig. 1. Main Menu

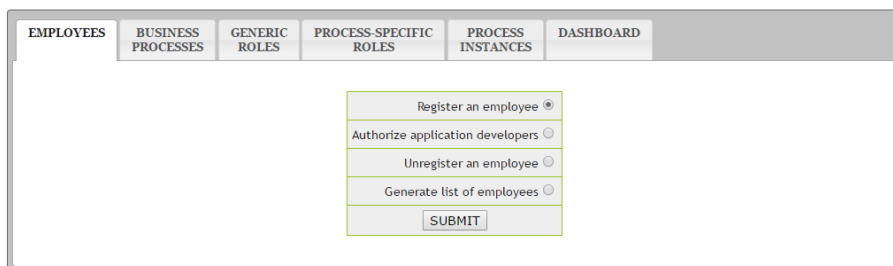


Fig. 2. Administration Menu

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Sl. No.	Entity ID	Name	Email
1	ADMIN2	Spencer Tracy	eflh004@gmail.com
2	ADMIN4	Gary Cooper	eflh005@gmail.com
3	ADMIN3	Lana Turner	eflh006@gmail.com
4	ADMIN8	Tirath Ram Agarwal	eflh010@gmail.com
5	ADMIN1	Sarah Connor	eflh003@gmail.com
6	ADMIN01	John Brown	ennflo002@gmail.com
7	ADMIN7	Steve McQueen	eflh009@gmail.com
8	ADMIN5	Harsh Vardhan	eflh007@gmail.com
9	ADMIN6	Burt Lancaster	eflh008@gmail.com

Fig. 3. List of employees

Process ID	Process Name	Process Description
OrderToCash	Order To Cash Process	The process is originated by a Salesperson, who receives a Purchase Order from a customer, and who is held responsible by the Management for order fulfillment. It then flows through (1) Storekeeper, for withdrawing ordered items from Stores, (2) Dispatch Clerk, for dispatching ordered items to the customer, and (3) Accounts Officer, for invoicing and receiving payment from the customer.

Fig. 4. List of business processes

Selected process	OrderToCash::Order To Cash Process
List of current originators	ADMIN4::Gary Cooper ADMIN5::Harsh Vardhan
Selected process	OrderToCash::Order To Cash Process
List of current resource persons	ADMIN2::Spencer Tracy ADMIN3::Lana Turner ADMIN1::Sarah Connor

Fig. 5. List of Originators and ResourcePersons

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Employee (Employee ID::Name)	Process ID	Roles
ADMIN3::Lana Turner	OrderToCash	Accounts Officer
ADMIN5::Harsh Vardhan	OrderToCash	Salesperson
ADMIN4::Gary Cooper	OrderToCash	Salesperson
ADMIN2::Spencer Tracy	OrderToCash	Dispatch Clerk
ADMIN1::Sarah Connor	OrderToCash	Storekeeper

Fig. 6. List of process-specific roles

Premium Products Inc

Hello, Gary Cooper !

What do you want to do now ?

There are no processes pending for your action.

Fig. 7. Electronic Office login screen

Select a process:	<input type="text" value="OrderToCash::Order To Cash Process"/>
Input process instance identifier (optional, but desirable)	<input type="text" value="PO REDGEN-223 from Redmond General Hospital"/>
<input type="button" value="SELECT"/>	

Fig. 8. Process initiation screen

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Welcome, Gary Cooper

By:	Employee::ADMIN4::Gary Cooper
Date and time:	28-Jun-2017::11:23:46
Subject	OrderToCash::Order To Cash Process - PO REDGEN-223 from Redmond General Hospital

PLEASE RECORD YOUR PRELIMINARY **NOTES** AND CLICK SUBMIT
(Note: In addition to the selected resource persons,
the process also flows back to the Originator, ADMIN4::eflh005@gmail.com::Gary Cooper)

Select zero or more resource persons:	<div style="border: 1px solid gray; padding: 2px;"><p>ADMIN2::Spencer Tracy – Dispatch Clerk ADMIN3::Lana Turner – Accounts Officer ADMIN1::Sarah Connor – Storekeeper</p></div>
Notes:	<div style="border: 1px solid gray; padding: 2px;"><p>Hello Sarah,</p><p>We have received PO REDGEN-223 from Redmond General Hospital. Please hand over the ordered goods to Spencer for immediate dispatch to the customer.</p><p>Thanks,</p></div>
<input type="button" value="SUBMIT"/>	

Fig. 9. Instantiated process pending for action by Gary Cooper

The following business process instance awaits your attention:-

Process ID: ElectronicOffice
Instance ID: 1
Subject: OrderToCash::Order To Cash Process - PO REDGEN-223 from Redmond General Hospital
Originated by: Employee::ADMIN4::Gary Cooper

Fig. 10. Email alert received by Sarah Connor

Electronic Office

Welcome, Sarah Connor

By:	Employee::ADMIN4::Gary Cooper
Date and time:	28-Jun-2017::11:23:46
Subject	OrderToCash::Order To Cash Process - PO REDGEN-223 from Redmond General Hospital

By:	Employee::ADMIN4::Gary Cooper
Date and time:	29-Jun-2017::00:18:45
Notes	Hello Sarah, We have received PO REDGEN-223 from Redmond General Hospital. Please hand over the ordered goods to Spencer for immediate dispatch to the customer. Thanks, Gary
Sent To	Originator, ADMIN1::Sarah Connor -- Storekeeper

PLEASE RECORD YOUR **NOTES** AND CLICK SUBMIT
(Note: In addition to the selected resource persons,
the process also flows back to the Originator, ADMIN4::eflh005@gmail.com::Gary Cooper)

Select zero or more resource persons:	ADMIN2::Spencer Tracy -- Dispatch Clerk ADMIN3::Lana Turner -- Accounts Officer ADMIN1::Sarah Connor -- Storekeeper
Notes:	<div style="border: 1px solid black; height: 50px;"></div>
<input type="button" value="SUBMIT"/>	

Fig. 11. Form seen by Sarah Connor

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Archived Process Name: ElectronicOffice

By:	Employee::ADMIN4::Gary Cooper
Date and time:	28-Jun-2017::11:23:46
Subject	OrderToCash::Order To Cash Process - PO REDGEN-223 from Redmond General Hospital

By:	Employee::ADMIN4::Gary Cooper
Date and time:	29-Jun-2017::00:18:45
Notes	Hello Sarah, We have received PO REDGEN-223 from Redmond General Hospital. Please hand over the ordered goods to Spencer for immediate dispatch to the customer. Thanks, Gary
Sent To	Originator, ADMIN1::Sarah Connor -- Storekeeper

By:	Employee::ADMIN1::Sarah Connor
Date and time:	29-Jun-2017::09:25:22
Notes	Hi Gary, I have handed over 1 unit of Vesta-301i to Spencer today. Sorry, I have run out of stock of FX-7102. The good news is that I am scheduled to receive 10 units of FX-7102 from our vendor 3 days from today, after which I will hand over 1 unit to Spencer. Sarah
Sent To	Originator, ADMIN2::Spencer Tracy -- Dispatch Clerk, ADMIN1::Sarah Connor -- Storekeeper

By:	Employee::ADMIN1::Sarah Connor
Date and time:	01-Jul-2017::21:22:38
Notes	Hello Gary, I have handed over 1 unit of FX-7102 to Spencer today. With this, Spencer has all the items ordered in this PO. Sarah
Sent To	Originator, ADMIN2::Spencer Tracy -- Dispatch Clerk

By:	Employee::ADMIN2::Spencer Tracy
Date and time:	02-Jul-2017::01:07:05
Notes	Hello Gary, I have dispatched all the ordered goods to Redmond General Hospital today, along with a dispatch note, DN-REDGEN-223 . I have verified with the PO and believe the delivery is complete. Spencer
Sent To	Originator

Electronic Office

By:	Employee::ADMIN4::Gary Cooper
Date and time:	02-Jul-2017::10:55:37
Notes	<p>Hello Lana,</p> <p>We have completed shipment of the ordered goods to the customer. Please collect the due amount.</p> <p>Thanks,</p> <p>Gary</p>
Sent To	Originator, ADMIN3::Lana Turner -- Accounts Officer

By:	Employee::ADMIN3::Lana Turner
Date and time:	02-Jul-2017::22:02:12
Notes	<p>Hello Gary,</p> <p>I have sent an invoice, INV-REDGEN-223, to Redmond General Hospital for US\$ 3500/-. I am waiting for them to pay up, and shall notify you as soon as I receive the amount.</p> <p>Lana</p>
Sent To	Originator, ADMIN3::Lana Turner -- Accounts Officer

By:	Employee::ADMIN3::Lana Turner
Date and time:	05-Jul-2017::23:37:25
Notes	<p>Hi Gary,</p> <p>I received today the due amount of US\$ 3500/- from Redmond General Hospital.</p> <p>Lana</p>
Sent To	Originator

Fig. 12. Archived process instance example

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