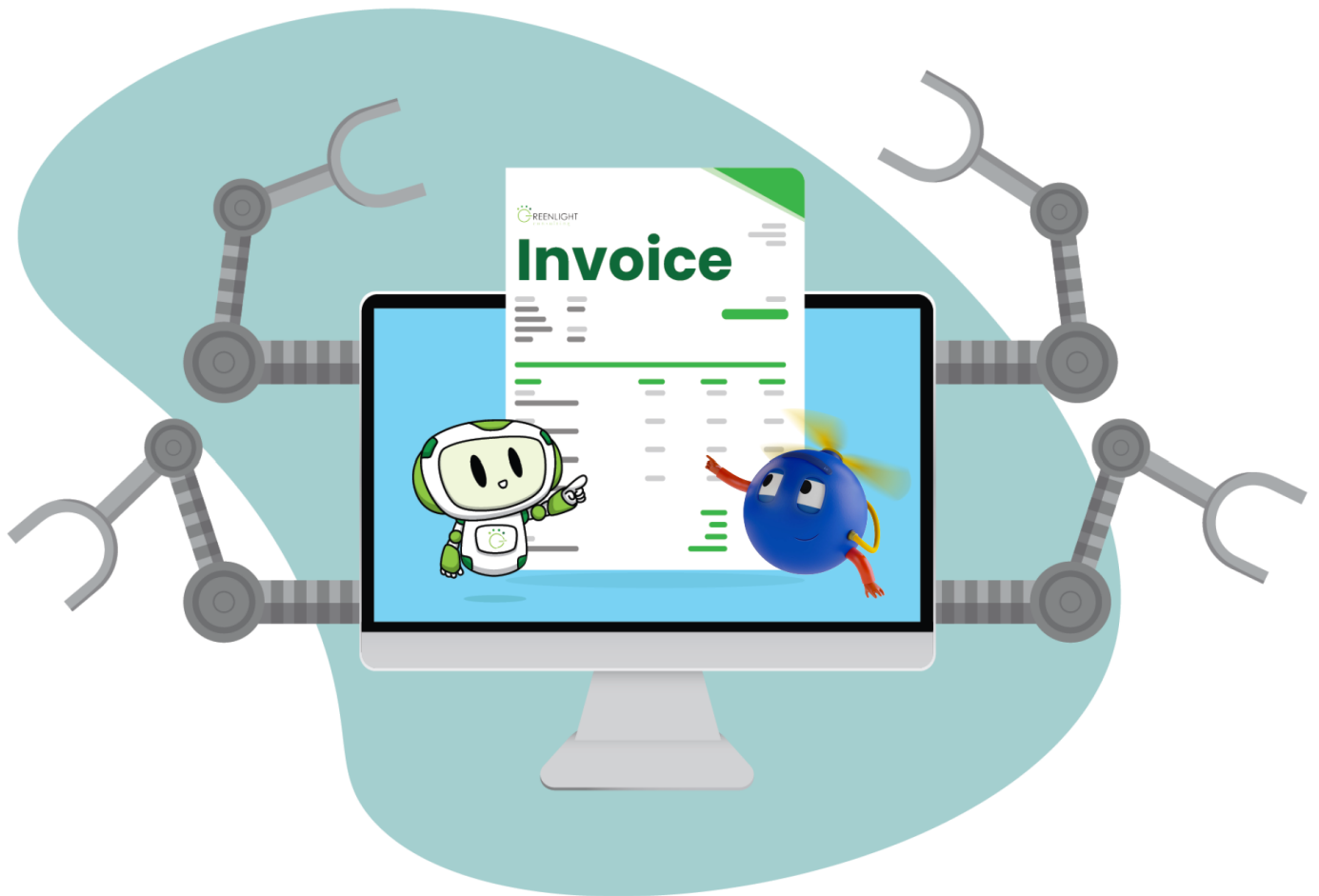# Capstone Project:

Northwest Construction

Greenlight's Academic Alliance & Mentoring (GLAAM) Program

Introduction

The Northwest Construction capstone project is based on multiple real-world invoicing use cases. It is intended to provide students with the opportunity to apply course learnings to a practical situation in the RPA space.

Greenlight's Academic Alliance and Mentorship (GLAAM) Program is dedicated to elevating student learning and growing talent in the wider RPA ecosystem.

Problem Statement

Vision

The goal is to have a streamlined process where the invoices are created automatically and quickly so that the payments are processed faster for the vendors and the Accounts Payable support staff are freed up to do more value-add activities.

Issues

Users are involved in tedious, repetitive tasks to match the invoice information with the data in the Procurement System and lookup tables, before generating the final invoice for payment processing. There are currently a significant number of delays in the payment process resulting from human error in transcribing the invoice details into the Procurement System.

Process Overview

Process Frequency	Daily
Number of invoices processed daily	~200
Average Monthly processed invoice	~3200
Number of persons performing the process	~5 FTE
Expected Volume increase during peak periods	15%-17%
Total number of vendors	~1000 Vendors
AHT per invoice	~ 5 mins with +1-3 mins variance

Pain Points

1. High volume of invoices averaging approx. 3200 per month

2. Multiple vendor management

3. Human error while processing invoices

4. High staff turnover (rotation of employees performing this task)

Context

After the Purchasing team creates a Purchase Order (PO) in the Procurement system, the PO is sent out to the vendor who in turn sends the materials or provides services as requested and detailed in the PO. Once the supplies from the vendors are received and acknowledged, or services rendered, the vendor will send an invoice to the Accounts Payable team thus triggering the invoice process that is to be automated. If the invoice from the vendor and the Purchase Order reconciles, a new invoice is then created in the system, processed, and paid. If there are any discrepancies, the Purchase Order may need to be corrected and/or the vendor is contacted to resolve any issues.

Once the invoice is verified, it is then "closed" (invoice is created), the Team Lead approves (saves the invoice in the system), and that the Accounts Payable - Payments team can then view these created invoices and release payments to the vendors.

Objectives Expected by the Business Owner

1. To reduce delays in the payment process from human error in transcribing invoice details – improve overall timeliness and accuracy.
2. To improve the level of service to payments team and vendors by rededicating staff time to more value-add activities and minimizing time spent on manual and repetitive transaction processing.

AS IS Process

AS IS Process Steps

Unless otherwise specified, the "user" mentioned below is an Accounts Payable Analyst.

High-Level steps of the process are defined below:

1. Vendor sends the invoice to the Accounts Payable email address as an attachment in PDF format.

2. The AP Analyst moves the email to the dedicated folder based on the vendor's name.

3. Verifies if the email has an attachment. If yes, then the invoice attachments from the email are saved to the network shared drive accessible to all users on the Accounts Payable team.

4. Opens the PDF to compare information in the invoice with the corresponding PO created previously in the Procurement System (referred to as "the system" in the remaining steps).

5. Logs into the system and navigates to the Create Invoice module.

6. Enters the PO Number on the invoice into the PO search field in the system, to retrieve the saved purchase order information.

7. Verifies all the vendor information on the PO, including the vendor's name, vendor address and bank account on the PO with the information on the invoice.
   a. If the vendor information on the PO does not match the information on the invoice, the AP team searches a "Vendor Details" Excel lookup table with the Vendor Code* to verify the details are correct.
   *Vendor Code is a unique code for each vendor and is found in the procurement system.
   b. The bank account on the invoice should match the bank account in the "Vendor Details" Excel lookup table.

8. Verifies the carrier and currency on the invoice with the information in the system.

9. a. Extracts the mode of payment from the "Mode of Payment**" Excel lookup table, determined by carrier and currency.
   **Mode of Payment can vary for example, Electronic, Payment link, Cheque, Bank Deposit
   c. Enters the mode of payment into the system.

10. Fills in the Invoice Number, Invoice Date, and current date as Invoice Received Date.

11. Verifies if the invoice is a Materials Invoice or Service Invoice by checking the PO Type in the system.

12. For a Materials Invoice, the user verifies the line items on the invoice, matching the line items on the PO already in the system.

13. For both Materials and Service Invoices, the user verifies the Invoice Total with the Total on the PO.

14. Fills in the Invoice Total field in the system with the Total on the invoice. *This is the amount the vendor is requesting to be paid.

15. Verifies the PO Balance*** in the system, which is auto populated as soon as the Invoice Total is entered into the Invoice Total field.
    ***The PO Balance is the difference between the Purchase Order Total and Invoice Total.

16. If the PO Balance is 0.00 in the system, then the user can complete (i.e., close) the Invoice successfully. This triggers a notification to be sent to the Accounts Payable Team Lead for approval (step 18).

17. If the Balance is anything more than 0.00 then the Invoice is closed partially by the user. This automatically triggers a notification to be sent to the AP Team Lead who then verifies the invoice details with the purchasing team.

    Note below example valid scenarios where a Materials Invoice is partially invoiced:
    Scenario Part A- The purchasing team ordered 10 laptops and hence created a PO(**X**) in the system with cost of 10 laptops whereas due to unavailability of requested configurations, the vendors were able to send only 8 laptops, so they send the invoice(**Y**) with the total of 8 laptops only, meaning that the total on the PO would not match the total on the Invoice hence the Balance (**X-Y**))

    *One or more invoices can be associated to a single purchase order number.

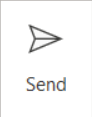   **Scenario Part B**- The 2 laptops sent by vendors after a while had another invoice(**A**) attached to it but was part of the same purchase order(**X**).

18. AP Team Lead approves (saves) the invoice in the system.

19. After all invoices have been processed, the AP Analyst sends an email to the entire Accounts Payable team informing them how many invoices have been created, and how many were approved successfully.

Sample Inputs

1. Vendor email with Invoice attached

Send | To | ○ accountspayable@nwconstructions.com
| Cc |
| Subject | RMP SUPPLY INVOICE# 1076549

PDF RMP SUPPLY.pdf ⌄
58 KB

Hello ,

Please find attached the Invoice,

RMP SUPPLY,
166 Ang Mo Ave,
4308 Singapore

2. Summary email to the Accounts Payable team

Send | To | ○ accountspayable@nwconstructions.com
| Cc |
| Subject | INVOICES CREATED 20 JANUARY 2021

Hello,

Please find the details on invoice processed in the system,

Number of Invoices created: **180**
Number of Invoices closed and approved: **160**

If any questions, please email AccountsPayableSupport@nwconstructions.com

Thanks ,
Accounts Payable Support

3. "Mode of Payment" Excel Lookup File
   (Refer to excel file: 'Mode of Payment')

	A	B	C
1	Carrier	Currency	MOP
2	BEL Cargo	SGD	Electronic
3	MARS	USD	Cheque
4	Ever Made	YEN	Electronic
5	Dartin	USD	Payment Link
6	AHL Cargo	USD	Bank Deposit
7	Destin Made	INR	Cheque
8	Columbian	USD	Bank Deposit
9	Delta Board	EUR	Electronic
10	Cargo Light	AUD	Electronic
11	BEL Cargo	USD	Cheque
12			

4. "Vendor Details" Excel Lookup File

(Refer to excel file: 'Vendor Details')

	SUPPLIER TYPE	SUPPLIER NAME	VENDOR CODE	INVOICE TYPE	CARRIER	BANK ACCOUNT	IBAN	VENDOR ADDRESS	ADDRESS Line 2	ZIP	CITY	COUNTRY	COUNTRY CODE
1	SUPPLIER TYPE	SUPPLIER NAME	VENDOR CODE	INVOICE TYPE	CARRIER	BANK ACCOUNT	IBAN	VENDOR ADDRESS	ADDRESS Line 2	ZIP	CITY	COUNTRY	COUNTRY CODE
2	OPEN	HOUSING CONSTRUCTIONS PTE LTD	1109-5678456373	Service	MARS	678905678	LN456091342333	Nedre Slottsgate 28		157	Oslo	Norway	NO
3	Permanent	RR COMPANY CO	1004-2236790891	Material	Ever Made	5489632728		200 wangfujing	Doncheng	100836	Beijing	CHINA	CN
4	OPEN	RMP SUPPLY	1506-1167890324	Material	BEL Cargo	43689087	BE346804262809	166 Ang Mo Ave		4308	SINGAPORE	SINGAPORE	SG
5	Closed	HOME MART COMPANY AS	1202-7896454254	Service	Columbian	6373983709		2700 West End Ave		TN 37203	Nashville	USA	US
6	OPEN	ATLANTIC SUPPLIES	1107-1125657683	Service	Dartin	5438890		109 Lor 1 toa Payoh		4221	SINGAPORE	SINGAPORE	SG
7	OPEN	SQG CONSTRUCTION COMPANY PTE LTD	1055-1167854323	Material	Delta Board	4353890721	RN683649912869	100-005 Chiyoda City	Marunounchi	543	Tokyo	Japan	JP
8	OPEN	BRIDGE SUPPLY PTE LTD	1167-8954389028	Service	Cargo Light	32727682	TD621882010982	51 namdaemun		5001	Seoul	South Korea	SK
9	OPEN	MIE YUNG SUUPLIES PTE LTD	1487-2114368967	Service	Destin Made	476278390	TY681476278390	Tsim Sha Tsui	Salisbury Rd	3289	Hong Kong	Hong Kong	HK
10	OPEN	MELBOURNE CONSTRUCTION SUPPLY	1308-4456789523	Service	AHL Cargo	7890652		406 Bourke Street		3000	Melbourne	Australia	AU
11	OPEN	MELBOURNE CONSTRUCTION SUPPLY	1308-4456789523	Service	AHL Cargo	5689874321		406 Bourke Street		3000	Melbourne	Australia	AU
12													
13													

5. Sample "Materials" Invoice
   (Refer to pdf file: 'RMS Supply')

RMP SUPPLY

166 Ang Mo Ave,
4308 Singapore

INVOICE

INVOICE # 1076549
DATE: 09 APRIL 2020
DUE DATE:12 APRIL 2020
PAYMENT TERMS: NET 30 DAYS
TRACKING NO:84678890

BILL TO:
Northwest Construction Company
c/o Northwest Business Services Inc.
740 Galloway Street, Yorkshire
3408 Brussels,
Belgium

SHIP TO:
ABC Constructions.
1204 Bridgeport Street
67990 Wayne, Indianapolis

SALESPERSON	P.O. NUMBER	REQUISITIONER	SHIPPED VIA	CURRENCY	TERMS
You Ching	BEL0000005678		BEL CARGO	SGD	Due on receipt

PROD NO	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL
RMP001	Landmark Water Pipes	3	Pack	355.0	1,065
RMP780	InDesign Roof Shingles	60	Pieces	70.0	420
RMP445	Construction Planks	10	Pieces	80	800
RMP442	ADL Metallic sheets	6	Pieces	330	1,980
RMP904	Watermark Resistant Sheets	14	Pieces	124	1,736

SUBTOTAL	**6601**
SALES TAX	140
FREIGHT CHARGE	100
TOTAL DUE	6841

PAYMENT INFORMATION:
IBAN:BE346804262809
SWIFT: BELEANOM
Bank Account (SGD)-43689087

THANK YOU FOR YOUR BUSINESS!

6. Sample "Service" Invoice
   (Refer to pdf file: 'Melbourn Construction Supply')

MELBOURNE CONSTRUCTION SUPPLY PTE LTD

INVOICE

INVOICE # :7560987
DATE: 05/21/2020

BILLTO:
Northwest Construction Company
c/o Northwest Business Services Inc.
740 Gallesway Street, Yorkshire
3408 Brussels,
Belgium

SHIP TO: General Works Inc,
1600 E Central Expy,
TX 76543, United States

Customer PO# AUS00000034567
Shipped Via: AHL Cargo

SALESPERSON	CUSTOMER CODE	PAYMENT TERMS	DUE DATE
Roxanne	GW 0092	Due on receipt	05/22/2020

QTY	DESCRIPTION	UNIT PRICE	LINE TOTAL
1.00	INSTALLATION JACKS	1202.00	$1202.00
1.00	MAIN Pipe INSPECTION	7880.00	$7880.00
1.00	FREIGHT HANDLING	4550.00	$4550.00
		SUBTOTAL	$13632.00
		SERVICE TAX	$150.00
		TOTAL(USD)	$13782.00

KINDLY MAKE ALL REMITTANCE TO: _____
MELBOURNE CONSTRUCTION SUPPLY PTE LTD
USD ACCOUNT NO -568-9874321
AUS ACCOUNT NO-7890652
NOTE: Interest will be levied on OVERDUE Amount _____

MELBOURNE CONTRUCTION SUPPLY PTE LTD
406 Bourke Street, CBD,
Melbourne Victoria 3000

MELBOURNE CONTRUCTION SUPPLY PTE LTD
Zelderseweg 645 ,3783 LN Terschuur
Netherlands

THANK YOU FOR YOUR BUSINESS!

TO BE Process

TO BE Requirements

Michael Roswell, the process SME, would like to see the most optimized automated solution to free up the users on his team from the mundane tasks of comparing the invoices. He expects this automation to reduce the overall time delays and increase user satisfaction. Michael has requested the following to be incorporated into the solution:

1. Attachment(s) from each email must be saved in a shared folder and the email must be moved to its corresponding folder (Vendor Name) in the inbox as per as-is process.
2. Invoice details must be extracted correctly and compared with the existing vendor information as per the as-is process. Instead of the lookup table mentioned in step 7, a vendor details table in the procurement system should be looked into as an alternative since it is the source-of-truth.
3. A new invoice must be created with correct details in the system, as per as-is process.
4. The invoice once closed (created) must be approved by a human user, as per as-is process.
5. An execution report must be generated with all the invoice details including the Received Date, Approved Date and Vendor Information for all the invoices processed.
6. An email must be sent out to the Accounts Payable team to notify them the invoices were processed with the execution report attached.

Known Business Exceptions

Exception Name	Action to be taken
Wrong Vendor on PO	Notification to be sent out to Accounts Payable team to investigate.
Bank Account Mismatch	Notification to be sent out to Accounts Payable team to investigate.
Wrong Currency	Notification to be sent out to Accounts Payable team to investigate.
Freight Charges not on Invoice	Notification to be sent out to Accounts Payable team to investigate.
Missing PO	The process should fail. Notification to be sent out to Accounts Payable team to investigate.
Line Item Mismatch	The process should fail. Notification to be sent out to Accounts Payable team to investigate.
Vendor Information Mismatch	Notification to be sent out to Accounts Payable team to investigate.
Mode of Payment Not Found	The process should fail. Notification to be sent out to Accounts Payable team to investigate.

Exception Name	Action to be taken
Carrier Name Mismatch	The process should fail. Notification to be sent out to Accounts Payable team to investigate.
Invoice Total More Than PO Total	The process should fail. Notification to be sent out to Accounts Payable team to investigate.

About Greenlight Consulting

Greenlight Consulting is a Robotic Process Automation and IT Staffing company based in Toronto, with a national footprint. Being a boutique IT Consulting and Staffing firm for over 13 years and working with some of North America's largest organizations, we have a proven track record for helping clients solve their Human and Digital resourcing needs.