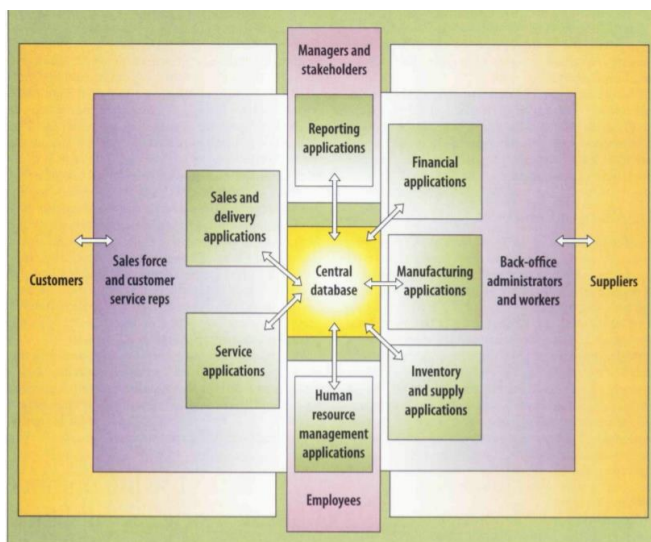


# The Benefits of Implementing an Enterprise Resource Planning System at Speed Gear:

## ERP and SAP Introduction:

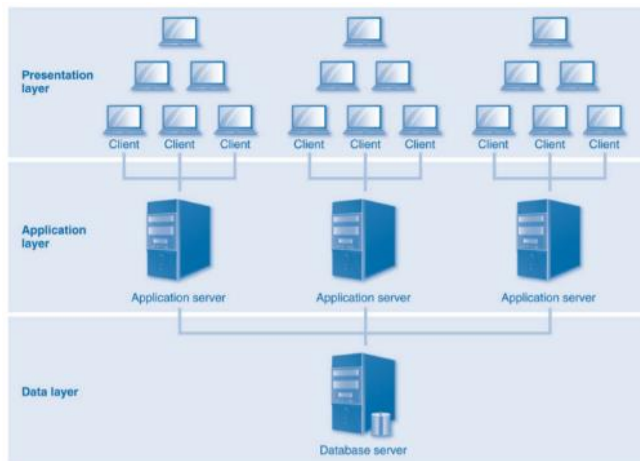
Speed Gear currently has IT systems in place that have been developed in an ad-hoc fashion, where different businesses areas have their own IT systems with their own databases. The nature of a business process however is that it is cross-functional meaning that it would need to be executed across functional departments. Without the implementation of an IT system that has a centralised database accessible to all business areas, Speed Gear runs the risk of facing many issues. Firstly, a department would need to log in to their own IT system and then contact another department regarding the completion of a process for the latter department to begin their process. This method of communication is inefficient. Secondly, having different IT systems in different business areas inevitably will lead to inconsistent information being passed through business processes.

To mitigate these issues, an Enterprise Resource Planning (ERP) System would need to be implemented. As defined by Monk and Wagner (2013, p.1), ERP systems are software programs that include a centralised database that is accessible to every business area. As seen in Figure 1, they provide applications that enable each business area to interact with the central database to report, document, manage, and track the progress of business processes.



**Figure 1:** Anatomy of Enterprise System (Davenport, 1998, p.124)

As seen in Figure 2, the client-server architecture consists of 3 layers: the first being the front-end graphical user interface which enables employees to interact with the system; the second being the application layer which consists of application servers providing the functionality; and the third being the data layer consisting of a centralised database server containing all the data created and generated.



**Figure 2:** Three layers of the client-server architecture (Magal and Word, 2012, p.24)

This architecture enables business areas to access their own data as well as data from other business areas. Therefore, a business area that is responsible for executing process 2 that requires the completion of another process 1, can track the progress of process 1 by accessing the ERP system, and then begin process 2 on completion of process 1 with little communication delay nor miscommunication between the business areas. All departments get access to real-time data, meaning changes made to data by one department is changed for all in real-time, eliminating the need for that department to directly contact other departments regarding the change, thus further decreasing the likelihood of miscommunication and increasing efficiency.

An ERP System commonly used by companies worldwide is that of German software company SAP AG, called SAP ERP. Implementing ERP SAP significantly improves the efficiency of business processes. Research by Annamalai, Ramayah (2011) found that Indian manufacturing firms had a procurement cost reduction of up to 30% and IT cost reductions of up to 35% after the implementation of SAP ERP.

In SAP, data is grouped into 3 categories: organizational data (data regarding Speed Gear's organisational structure such as different company codes, plants, storage locations); master data (long-term data such as customers, material, vendors); and transactional data (data generated from transactions, stored as transactional documents). These data categories and documents can be displayed and called by their number (identifier) when carrying out processes that require them. SAP auto-fills the relevant fields when the identifier is called, and it also includes extensive search tools when the identifier is not known, thus improving the efficiency of carrying out processes and reducing the overall time it takes to complete a process. For example, below shows the creation of a sales order using a quotation document.

Create with Reference

Inquiry Quotation Order Contract SchedAgree BillDoc

Quot.: 20000093

Requested Deliv.Date:

Search Criteria

Pur. Order:

Sold-To Party:

WBS Element:

Search

Copy Item Selection Cancel

Create Standard Order: Overview

Display Propose Items Header Output Preview Reject Document Loading Units and Aggregation Categories More

Standard Order: Net Value: 406,395.00 USD

Sold-To Party: 23106 Big City Bikes / 350 Columbia Rd NW / Washington DC 20009

Ship-To Party: 23106 Big City Bikes / 350 Columbia Rd NW / Washington DC 20009

Cust. Reference: Cust. Ref. Date:

Sales Item Overview Item detail Ordering party Procurement Shipping Reason for rejection

Req. Deliv. Date: 17.02.2022

Complete Dlv:

Delivery Block:

Billing Block:

Pay Terms: 0001 Pay immediately w/o deduction

Inco. Version:

Inco. Location: Miami

Deliver Plant:

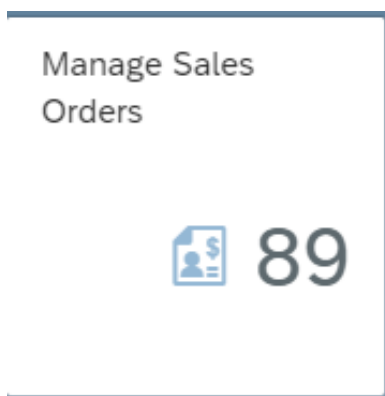
Total Weight: 45,477,249 OZ

Volume: 0,000

Pricing Date: 17.12.2021

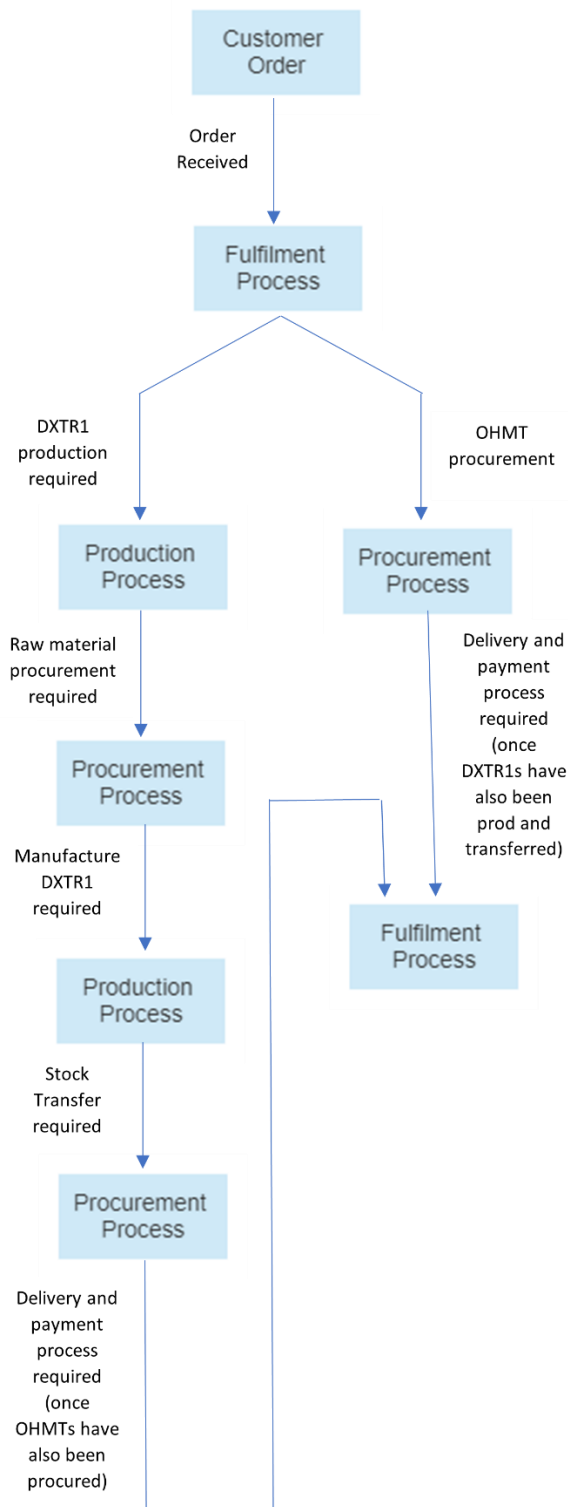
Item	Material	Req. Segment	Order Quantity	Un	S	Item Description	Customer Material Num
10	6XTR1904		150	EA		Deluxe Touring Bike (black)	
20	GHRT1904		30	EA		Off Road Helmet	

Some applications in SAP are also dynamic in that clients can glance at key information within an application without having to enter the application and search for this information. This in turn saves the client from time-consuming activities such as searching for this information within an app. An example of this is the Manage Sales Order app shown below. Here, the number of sales orders is displayed on the app tile.

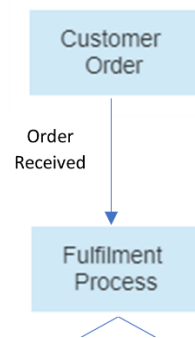


SAP allows Speed Gear to pick which modules to implement into their system to meet their needs. There are 3 core processes that would be beneficial for Speed Gear to implement and integrate into their SAP system: Fulfilment, Procurement, and Production. The benefits of implementing these 3

processes in SAP will be discussed concurrently with how to integrate them. The integration scenario goes as follows: Global Bike Inc. (GBI – a company selling bicycles and bicycle-related accessories) receive a customer inquiry from Big City Bikes (BCB) about 150 black deluxe touring bikes (DXTR1s) and 30 off-road helmets (OHMTs) to be delivered at most 2 months after the enquiry date. GBI do not have enough OHMTs in stock nor DXTR1s. A diagrammatic representation of this integrated business process scenario is presented below.



## Fulfilment of the Customer Order:



As defined by Magal and Wood, the fulfilment process refers to all the steps that are involved in selling and delivering products to customers (2012, p.6). This process begins with the sales department receiving a customer's order, then creating a quotation and sales order. The warehouse then retrieves this sales order data from the SAP system, checks the availability of the required stock. If there are enough goods in stock to fulfil the order, the fulfilment process continues, the warehouse prepares the goods for shipment and the accounting department creates and sends the invoice and processes the customer's payment. An illustration of this process is shown below in Figure 3.



**Figure 3:** A fulfilment process (Magal and Word, 2012, p.9)

Pre-sales activities can be carried out in SAP such as determining if a customer should be given a discount based on their purchase history. For example, below it shows that BCB has had 1 previous sales order with Global Bike Inc (GBI), and the second shows all the sales orders for GBI. GBI may then decide to give BCB a discount of 10% on their entire order, which would in-turn benefit GBI promoting customer loyalty for customers who do not have a rich history of purchases from GBI. Speed Gear could use this information for demand forecasting since they could examine the purchasing patterns of their customers.

SAP

Manage Sales Orders

Standard

Search

Sales Order:

Sold-To Party:

Big City Bikes (25106)

Customer Reference:

Requested Delivery Date:

Document Date:

Sales Orders (1)

Standard

Create Sales Order

Reject All Items

Set Delivery Block

Remove Delivery Block

Set Billing

<input type="checkbox"/> Sales Order	Sold-To Party	Customer Reference	Requested Delivery Date	Overall Status	
<input type="checkbox"/> 89	Big City Bikes (25106)	904	17.02.2022	Completed	4

Not Filtered						
Sales Orders (89) Standard						
Create Sales Order Reject All Items Set Delivery Block Remove Delivery Block Set Billing Block Remove Billing Block						
<input type="checkbox"/> Sales Order	Sold-To Party	Customer Reference	Requested Delivery Date	Overall Status	Net Value	Document Date
<input type="checkbox"/> 84	The Bike Zone (25097)	939	25.12.2021	Completed	21,400.00 USD	14.12.2021
<input type="checkbox"/> 83	The Bike Zone (25097)	939	28.12.2021	In Process	300,000.00 USD	14.12.2021
<input type="checkbox"/> 82	The Bike Zone (25097)	939	29.12.2021	Open	190,000.00 USD	14.12.2021
<input type="checkbox"/> 80	The Bike Zone (25096)	904	14.01.2022	Completed	20,092.50 USD	14.12.2021
<input type="checkbox"/> 79	Big City Bikes (25099)	936	14.12.2021	Completed	399,600.00 USD	14.12.2021
<input type="checkbox"/> 78	Big City Bikes (25097)	960	21.12.2021	Completed	147,025.00 USD	14.12.2021
<input type="checkbox"/> 77	The Bike Zone (25097)	329	13.01.2022	Completed	20,092.50 USD	13.12.2021
<input type="checkbox"/> 76	The Bike Zone (25096)	962	13.12.2021	Completed	20,092.50 USD	13.12.2021
<input type="checkbox"/> 75	The Bike Zone (25049)	906	13.12.2021	Completed	15,000.00 USD	13.12.2021
<input type="checkbox"/> 74	The Bike Zone (25096)	956	13.01.2022	Completed	20,092.50 USD	13.12.2021
<input type="checkbox"/> 73	The Bike Zone (25096)	962	13.12.2021	Open	21,400.00 USD	13.12.2021
<input type="checkbox"/> 72	The Bike Zone (25096)	934	13.01.2022	Completed	20,092.50 USD	13.12.2021
<input type="checkbox"/> 5000933	Beantown Bikes (5000)	933	12.12.2021	Open	3,000.00 USD	12.12.2021
<input type="checkbox"/> 71	The Bike Zone (25096)	The Bike Zone	12.12.2021	Completed	20,092.50 USD	12.12.2021
<input type="checkbox"/> 70	The Bike Zone (25096)	917	12.01.2022	Completed	20,092.50 USD	12.12.2021
<input type="checkbox"/> 69	The Bike Zone (25096)	916	12.01.2022	Completed	20,092.50 USD	12.12.2021
<input type="checkbox"/> 68	The Bike Zone (25049)	906	11.12.2021	Completed	20,092.50 USD	11.12.2021

The calculations of prices and costs are also automated in SAP. When applying a discount to a quotation created, SAP automatically calculates the net price after the discount is applied. This is beneficial as it avoids the likelihood of human error and also saves time compared to manually performing calculations. Below shows a 10% discount applied to the total price of BCB's requested quotation of DXTR1s and OHTM1s (RA00, where the net value deduced automatically by \$45,105 once the discount was applied, from a net value of \$451,500 to \$406,395).

Header Output Preview

More

Quotation:

Customer Reference: 904

Sold-To Party: 25106

Big City Bikes / 350 Columbia Rd NW / Washington DC 20009

Sales

Shipping

Billing Document

Accounting

Conditions

Account Assignment

Partner

Texts

Order Data

Status

Additional Data A

Additional Data B

Net:

406.395,00

USD

Tax:

0,00

Condition Record

Activate

Update

Pricing Elements

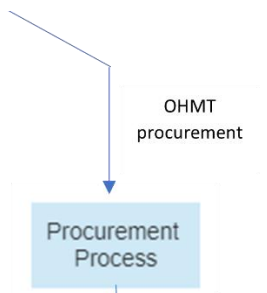
Activate: New Document Pricing

<input type="checkbox"/> I...	CnTy	Name	Amount	Crcy	per	UoM	Condition Value	Curr.	Status	ATO/MTS Component	Condition Value	CdCur	Stat
<input checked="" type="checkbox"/>	PR00	Price					451.500,00	USD			0,00		<input type="checkbox"/>
<input type="checkbox"/>		Gross Value					451.500,00	USD			0,00		<input type="checkbox"/>
<input checked="" type="checkbox"/>	K004	Material					50,00	USD			0,00		<input type="checkbox"/>
<input type="checkbox"/>	RA00	% Discount from Net	10,000 - %				45.155,00-	USD			0,00		<input type="checkbox"/>
<input type="checkbox"/>		Discount Amount					45.105,00-	USD			0,00		<input type="checkbox"/>
<input type="checkbox"/>		Rebate Basis					406.395,00	USD			0,00		<input type="checkbox"/>
<input type="checkbox"/>		Net Value for Item					406.395,00	USD			0,00		<input type="checkbox"/>
<input type="checkbox"/>		Net Value 2					406.395,00	USD			0,00		<input type="checkbox"/>
<input type="checkbox"/>		Total					406.395,00	USD			0,00		<input type="checkbox"/>
<input checked="" type="checkbox"/>	SKTO	Cash Discount					0,00	USD			0,00		<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	VPRS	Internal price					210.750,00	USD			210.750,00	USD	<input checked="" type="checkbox"/>
<input type="checkbox"/>		Standard - USA /With					195.645,00	USD			0,00		<input type="checkbox"/>
<input type="checkbox"/>													<input type="checkbox"/>
<input type="checkbox"/>													<input type="checkbox"/>



Stock Overview: Basic List		
Stock	Plant	
Plant	DL00	
Plant		
Stock Type		Stock
Unrestricted use		250,000
Qual. inspection		0,000
Returns		0,000
On-Order Stock		0,000
Consgt ordered		0,000
Reserved		0,000
Stck trans.(plnt)		0,000
Transfer (SLoc)		0,000
Consgt unrestr.		0,000
Consgt qual.insp.		0,000
GR Blocked Stock		0,000
Cust. inquiries		0,000
Cust. quotations		0,000
Sales orders		0,000
Cust.sched.agmts		0,000
Cust. contracts		0,000
Deliv. w/o charge		0,000

### Procurement of OHMTs:



As defined by Magal and Wood, the procurement process refers to all the steps involved in buying the materials needed from vendors in order to regulate stock levels and manufacture products (2012, p.5). This process begins with the warehouse producing a purchase request document after identifying which item(s) need restocking. The purchasing department then requests a quotation from vendors. Once the vendors have responded to the request, they are compared, and the best vendor is sent a purchase order to them to fulfil the order. The warehouse department then receive the materials from the vendor; and finally, the accounting department receive an invoice from the vendor regarding the cost of the materials and then send the payment. Since OHMTs are being purchased from an external vendor, this is known as an external procurement process. An illustration of this process is shown in Figure 4.



**Figure 4:** A procurement process (Magal and Word, 2012, p.8)



GBI would need to first purchase 10 OHMTs from a vendor, delivered to the Miami plant in order to meet the requirements for Big City Bike's sales order. The 2 vendors supplying this product are Spy Gear and Mid-West Supply. SAP's interface makes this process straightforward. It allows you to define what product you need to purchase along with the quantity, the delivery date, and a message describing the requisition. This provides clear communication to the vendors.

**Create Purchase Requisition**

Purchase Requisition ☐ Source Determination

**Texts**

Header note: Global Bike Inc. is formally requesting quotations for the following material. Quotes will be accepted until December 31st 2021 (2 weeks).

Sta.	Item	A	I	Material	Short Text	Quantity	Unit	C	Delivery Date	Material Group	Plant	Stor. Loc.	PG	Requisitic
	10			OHMT1904	Off Road Helmet	10	EA	D	17.02.2022	Safety Gear	DC Miami	Trading Go.		

Item: [10] OHMT1904, Off Road Helmet

**Material Data** Quantities/Dates Valuation Source of Supply Status Contact Person Texts Delivery Address Spec20...

Material: OHMT1904 Short Text: Off Road Helmet

Batch: Revision Level:

Material Group: SFTY Safety Gear ☐ IUID Relevant

The purchase requisition document can then be referenced in the Request for Quotation (RFQ) form by its identifier. Here, a deadline for the request can also be inserted to ensure the vendors respond in time so there's little delay knocking onto the customer of the sales order. The plant that the vendors should deliver OHMTs to is also defined (Miami MI00).

**Create RFQ : Initial Screen**

Reference to PReq Reference to Outline Agreement More

RFQ Type: AN Language Key: EN

RFQ Date: 17.12.2021 Quotation Deadline: 31.12.2021 RFQ:

**Organizational Data**

Purch. organization: US00 Purchasing Group: N00

**Default Data for Items**

Item Category: Delivery Date: T Plant: MI00 Storage location: Material Group: Req. Tracking Number:

Next, the purchase requisition form is referenced by its number and the 2 vendors are referenced by their identifier in order for SAP to autofill information. The 2 vendors already exist in GBI's master data.

**SAP** Create RFQ : Initial Screen

Reference to PReq Reference to Outline Agreement More

RFQ Type: AN  
 Language Key: EN  
 RFQ Date: 17.12.2021  
 Quotation Deadline: 31.12.2021  
 RFQ:

**Organizational Data**

Purch. organization: US00  
 Purchasing Group: N00

**Default Data for Items**

Item Category:  
 Delivery Date: T  
 Plant: MI00  
 Storage location:  
 Material Group:  
 Req. Tracking Number:

131.231.115.139 - Remote Desktop

RFQ Edit Header Item Environment System Help

**SAP** Create RFQ : Supplier Address

RFQ: Company Code: US00 Purch. Group: N00  
 RFQ Date: 17.12.2021 RFQ Type: AN Purchasing Org.: US00  
 Vendor: 107904

**Name**

Title: Company  
 Name: Spy Gear

**Search Terms**

Search term 1/2: 904

**Street Address**

Street/House number: 8405 Greensboro Dr.  
 Postal Code/City: 22102 McLean  
 Country: US USA Region: VA Virginia  
 Time zone: EST

**PO Box Address**

PO Box:  
 Postal code:  
 Company Postal Code:

**Communication**

Once the vendors respond, SAP generates a document with a comparison table to compare the offers of the two vendors. For GBIs request, Spy Gear are offering OHMTs for \$25 and Mid-West Supply are offering them for \$26.

131.231.115.139 - Remote Desktop

List Edit Goto Environment System Help

Price Comparison List in Currency USD

Quotation Material Supplier Additional Info More

Material	Quot.:	6000000224	6000000223	
Sh. Text	Bidder:	107904	125074	MEAN
Qty. in Base Unit	Coll. No.:	RFQ4904	RFQ4904	
OHMT1904	Val.:	250,00	260,00	255,00
Off Road Helmet	Price:	25,00	26,00	25,50
10 EA	Rank:	98 %	102 %	
Total Quot.	Val.:	250,00	260,00	255,00
	Rank:	98 %	102 %	

The quotation numbers in the first row are the numbers from the RFQs created earlier, and so corresponds with each vendor; 6000000224 is Spy Gear's and 6000000223 is Mid-West Supply's. The total value offered by Spy Gear is \$250, whereas the total value offered by Mid-West supply is \$260. SAP is useful in such instances, as it gives a ranking to each vendor, signifying to employees which vendor has the best offer. This can be seen as a precautionary measure to ensure Speed Gear choose the best vendor, especially in instances where requests for a material are made to many numerous vendors and so it's difficult to see how the prices compare. Since Mid-West Supply has a higher ranking (2<sup>nd</sup> 102% compared to Spy Gear's 1<sup>st</sup> 98%), its quotation is then rejected by checking the rejection checkbox on their quotation as shown below.

Item: 6000000223 10 ItCat.: Plant: MI00

Material: OHMT1904 Stor. Loc.: TG00

Short Text: Off Road Helmet

Mat. Grp: SFTY

**Quantity and Date**

RFQ Quantity: 10 EA QuotDdl: 31.12.2021

Delivery Date: 17.02.2022

**Deadline Monitoring**

1st Rem./Exped.: TrackingNo:

2nd Rem./Exped.: S. Mat.:

3rd Rem./Exped.:

No. Exped.: 0

**Quotation Data**

Net Order Price: 26,00 USD / 1 EA InfoUpdate:

Qty Conv.: 1 EA <-> 1 EA

Quot. Comment:

Tax Code:

☒ Rej. Ind.

Rejection Ind.

Quotation: /

The delivery for OHMTs from Spy Gear is processed. By simply referencing Spy Gear's RFQ, the delivery can be scheduled. In instances where the quantity is high, SAP also allows deliveries to be scheduled in parts. However, since there are only 10 OHMTs that need to be ordered, there isn't a need for delivery in parts so there is only one line for the delivery schedule.

**Create Purchase Order**

Standard PO | Vendor: 107904 Spy Gear | Doc. Date: 17.12.2021

Item: [10] OHMT1904, Off Road Helmet

Material Data | Quantities/Weights | **Delivery Schedule** | Delivery | Invoice | Conditions | Texts | Delivery Address | Confirmat...

S...	C	Delivery Date	Sched. Qty	Time	Stat. Del. Dte	GR qty	Purchase Req.	Requ...	No...	Open Quantity	Sc
<input type="checkbox"/>	D	17.02.2022	10		17.02.2022		10000091	10		51	
<input type="checkbox"/>										0	
<input type="checkbox"/>										0	
<input type="checkbox"/>										0	

**Create Purchase Order**

Standard PO | Vendor: 107904 Spy Gear | Doc. Date: 17.12.2021

Item: [10] OHMT1904, Off Road Helmet

Material Data | Quantities/Weights | **Delivery Schedule** | Delivery | Invoice | Conditions | Texts | Delivery Address | Confirmat...

S...	C	Delivery Date	Sched. Qty	Time	Stat. Del. Dte	GR qty	Purchase Req.	Requ...	No...	Open Quantity	Sc
<input type="checkbox"/>	D	17.02.2022	10		17.02.2022		10000091	10		51	
<input type="checkbox"/>										0	
<input type="checkbox"/>										0	
<input type="checkbox"/>										0	

Stock levels can be displayed at any point in the entire business process, which is useful to track the arrival of deliveries. OHMT's in stock have now changed from 20 to 30, signifying a successful delivery to the plant.

**Stock Overview: Basic List**

Material: OHMT1904  
Off Road Helmet

Plant	Stock
Plant M00	
Stock Type	
Unrestricted use	30.000
Qual. inspection	0.000
Returns	0.000
On-Order Stock	0.000
Consigt ordered	0.000
Reserved	0.000
Stock trans (pint)	0.000
Transfer (StLoc)	0.000
Consigt unresr.	0.000
Consigt qual insp.	0.000
GR Blocked Stock	0.000
Cust. inquiries	0.000
Cust. quotations	0.000
Sales orders	30.000
Cust.sched agmts	0.000
Cust. contracts	0.000
Deliv. w/o charge	0.000
Schd for delivery	0.000
Rcpt reservation	0.000

The goods and invoice receipt for the purchase are processed. Payments are then posted to the vendor. Documents are generated for these receipts, saving employees the hassle of having to manually produce the records.

Enter Incoming Invoice: Company Code US00

Transaction: Invoice

Balance: 0,00 USD

Basic Data

Payment

Details

Tax

Contacts

Note

Invoice date: 17.12.2021

Posting Date: 17.12.2021

Amount: 250,00 USD

☐ Calculate Tax

Tax Amount: XI (Input Tax)

Text: INVOICE 00904-904

Payment terms: Due immediately

Baseline Date: 17.12.2021

Vendor 0000107904

Spy Gear

8405 Greensboro Dr.

MCLEAN VA 22102

USA

TM Ref.

G/L Account

PO Reference

Purchase Order/Scheduling Agreement

4500000075

Goods/service Items

Layout: All information

Item	Amount	Quantity	Or...	Purchase order	Item	PO Text	Tax Code	No...	A	Acct Assgt	Ed
1	250,00	10EA	4500000075	10	Off Road Helmet		XI (Input Tax)				

Simulate Document in USD (Document currency)

Position	A	G/L	Act/Mat/Asst/Vndr	Amount	Curr...	Purchasing Doc.	Item	T...	Jurisd. Code	Tax date	Bus...	Cost Ce
1K		300000	Spy Gear / McLean VA 22102	250,00 - USD				XI				
2S		310000	Goods Receipt / Invoice Rec...	250,00 USD		4500000075	10	XI	FL0000000		BI00	

The accounting department can then access the invoice through its document identifier and post the payments to Spy-Gear by entering GBIs bank account information and the amount to be paid (\$250).

**SAP** Post Outgoing Payments: Header Data

Cancel selection Process Open Items More

Document Date: 17.12.2021 Type: KZ Company Code: US00  
Posting Date: 17.12.2021 Period: 12 Currency/Rate: USD  
Document Number: Translation dte:  
Reference: Cross-CC Number:  
Doc.Header Text: Trading part.BA:  
Clearing Text:

**Bank data**

Account: 100000 Business Area:  
Amount: 250  
Amt.in loc.cur.:  
Bank Charges: LC Bank Charges:  
Value date: 17.12.2021 Profit Center:  
Text: INVOICES 00504-904 Assignment:

**Open item selection** **Additional selections**

Account: 107904  
Account Type: K Other Accounts  
Special G/L Ind: Standard Ols  
Payt Advice No.:  
Distribute by Age  
Automatic Search

None  
Amount  
Document Number  
Posting Date  
Dunning Area  
Others

Account items 107904 Spy Gear

Document Nu...	D...	Document Date	P...	Busi...	Day...	USD Gross	CashDiscount	CDPer.
5105600226	RE	17.12.2021	31		0	250,00-		

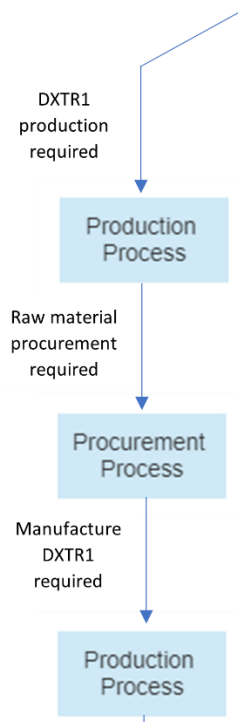
Processing Status

Number of Items: 1 Amount Entered: 250,00-  
Display from Item: 1 Assigned: 250,00-  
Reason Code: Difference Postings:  
Display in clearing currency Not Assigned: 0,00

SAP generates a document displaying GBIs General Ledger account balance which it updates any time a payment is made. This is beneficial for management at Speed Gear to get an overview of all bank transactions that have occurred. Below it is shown in the last row that £250 were used in this scenario's transaction of buying OHMTs from Spy Gear.

		5105600226		RE	17.12.2021	31	250,00-	USD	250,00-	USD
		5105600225		RE	16.12.2021	31	3.200,00-	USD	3.200,00-	USD
		1500000063		KZ	17.12.2021	25	250,00	USD	250,00	USD
		5105600226		RE	17.12.2021	31	250,00-	USD	250,00-	USD
*							0,00	USD	0,00	USD
**		Account 300000					6.400,00-	USD	6.400,00-	USD

## Production of DXTR1s:



As defined by Magal and Wood, the production process refers to all the steps involved in manufacturing the products within Speed Gear. This process begins with the creation of a production plan for the finished goods, where factors such as the demand forecast for finished goods are calculated and the production schedule is created (MPS). The identification of raw materials that are required are then calculated (MRP). Inventory is then checked to see if there are enough materials to produce the required amount of a finished good. If there are enough raw materials, the production process continues. If there are not enough raw materials, the production process is suspended and triggers the procurement process to procure the required materials before starting the production process again. Next, production occurs at the manufacturing plant. Once the finished goods are produced, they are then transferred to the finished goods inventory at the warehouse. An illustration of this process is shown in Figure 5.



**Figure 5:** A production process (Magal and Word, 2012, p.9)

The integration scenario hypothetically assumes that the only DXTR1s in stock are the 95 at the Miami plant in order to demonstrate the rest of the production process. The identification of raw materials needed have been calculated and are found at the manufacturing plant Dallas. In this

production process scenario. The first step taken is an MRP run to analyse the current inventory levels and generate the orders of dependent materials required for DXTR1s.

Statistics	
Materials planned	11
Materials with New Exceptions	11
Materials with Termination MRP List	

Parameters	
MRP Area	DL00
Plnt	DL00
Processing Key	NETCH
Create Purchase Requisition	2
SA Schedule Line	3
Create MRP List	1
Planning Mode	1
Scheduling	1

Database Statistics	
Planned orders changed	12
Planned orders deleted	11
Dependent requirements changed	10

Runtime Statistics	
--------------------	--

SAP then dynamically updates the stock/requirements list for the materials needed, promoting efficiency of the process. In this stock/requirements list, the planned order from the MRP run is then converted to a production order simply by selecting the corresponding line and pressing the 'Prod Order' button. This then changes the MRP element from 'PldOrd' to 'PrdOrd' as shown below.

Material: DXTR1904	
Description: Deluxe Touring Bike (black)	
MRP Area: DL00	DC Dallas
Plant: DL00	MRP type: M1
Material type: FERT	Unit: EA

A...	Date	MRP e...	MRP element data	Rescheduling...	E...	Receipt/Reqmt	Available Qty	Pro...
	17.12.2021	Stock					250	
	01.12.2021	IndReq	VSF			276-	26-	
	24.12.2021	----->	End of Planning Time					
	01.01.2022	PldOrd	0000007737/STCK			26	0	0000
	01.01.2022	IndReq	VSF			265-	265-	

Material: DXTR1904	
Description: Deluxe Touring Bike (black)	
MRP Area: DL00	DC Dallas
Plant: DL00	MRP type: M1
Material type: FERT	Unit: EA

A...	Date	MRP e...	MRP element data	Rescheduling...	E...	Receipt/Reqmt	Available Qty
	26.12.2021	----->	End of Planning Time				
	01.01.2022	PrdOrd	000001000084/PP01/Re			26	
	01.01.2022	IndReq	VSF			265-	



At this point, integration with the procurement department would be required in order to procure the necessary raw materials from vendors, in the same way that the OHMTs were procured above. Following this, the materials are received at the Dallas storage location and a goods receipt is produced recording each raw material and the quantity received, as shown below.

Line	Mat. Short Text	Wa...	OK	Qty in UnE	EUn	SLoc	Stock Segment	Batch	Valuation Type	M...	D...	Stock Type	Plant	JIT Call
1	Touring Aluminum Wheel Assembly	<input type="checkbox"/>	<input checked="" type="checkbox"/>	500	EA	Semi-Fin. Goods			561	+	Unrestricted-Use	Plant Dallas		
2	Touring Frame-Black	<input type="checkbox"/>	<input checked="" type="checkbox"/>	500	EA	Raw Materials			561	+	Unrestricted-Use	Plant Dallas		
3	Derailleur Gear Assembly	<input type="checkbox"/>	<input checked="" type="checkbox"/>	500	EA	Raw Materials			561	+	Unrestricted-Use	Plant Dallas		
4	Touring Seat Kit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	500	EA	Raw Materials			561	+	Unrestricted-Use	Plant Dallas		
5	Touring Handle Bar	<input type="checkbox"/>	<input checked="" type="checkbox"/>	500	EA	Raw Materials			561	+	Unrestricted-Use	Plant Dallas		
6	Pedal Assembly	<input type="checkbox"/>	<input checked="" type="checkbox"/>	500	EA	Raw Materials			561	+	Unrestricted-Use	Plant Dallas		
7	Chain	<input type="checkbox"/>	<input checked="" type="checkbox"/>	500	EA	Raw Materials			561	+	Unrestricted-Use	Plant Dallas		
8	Brake Kit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	500	EA	Raw Materials			561	+	Unrestricted-Use	Plant Dallas		
9	Warranty Document	<input type="checkbox"/>	<input checked="" type="checkbox"/>	500	EA	Raw Materials			561	+	Unrestricted-Use	Plant Dallas		
10	Packaging	<input type="checkbox"/>	<input checked="" type="checkbox"/>	500	EA	Raw Materials			561	+	Unrestricted-Use	Plant Dallas		

The raw materials are then issued to the production order so that the manufacturing departments can begin producing the bikes. The number of the production order produced earlier can be called to reference and autofill the lines to save time and keep the process efficient. All the OK checkboxes would be checked, the relevant quantities inserted, and then the goods posted by pressing Post. In this scenario the quantities would be 55 instead of 265 since 55 DXTR1s are needed to fulfil the sales order.

Line	Mat. Short Text	Wa...	OK	Qty in UnE	EUn	SLoc	Order	Acti...	Bus...	Co...	Stock Segm
1	Touring Aluminum Wheel Assembly	<input type="checkbox"/>	<input checked="" type="checkbox"/>	265	EA	SF00	1000082	0010	B100	US00	
2	Touring Frame-Black	<input type="checkbox"/>	<input checked="" type="checkbox"/>	265	EA	RM00	1000082	0010	B100	US00	
3	Derailleur Gear Assembly	<input type="checkbox"/>	<input checked="" type="checkbox"/>	265	EA	RM00	1000082	0010	B100	US00	
4	Touring Seat Kit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	265	EA	RM00	1000082	0010	B100	US00	
5	Touring Handle Bar	<input type="checkbox"/>	<input checked="" type="checkbox"/>	265	EA	RM00	1000082	0010	B100	US00	
6	Pedal Assembly	<input type="checkbox"/>	<input checked="" type="checkbox"/>	265	EA	RM00	1000082	0010	B100	US00	
7	Chain	<input type="checkbox"/>	<input checked="" type="checkbox"/>	265	EA	RM00	1000082	0010	B100	US00	
8	Brake Kit	<input type="checkbox"/>	<input checked="" type="checkbox"/>	265	EA	RM00	1000082	0010	B100	US00	
9	Warranty Document	<input type="checkbox"/>	<input checked="" type="checkbox"/>	265	EA	RM00	1000082	0010	B100	US00	
10	Packaging	<input type="checkbox"/>	<input checked="" type="checkbox"/>	265	EA	RM00	1000082	0010	B100	US00	

SAP is beneficial in this process in that it allows the user to examine the production order status. This is useful as it enables those involved in the business process to identify what has been done/needs to be done.

The screenshot below shows that goods issue has been posted and the costs have been updated, which is dynamically calculated by the goods issued, saving time on calculations and allowing those participating in the business process to examine the total costs of the order.

Order:

Material:

Status Business processes

Syst. Status

X	Stat...	Text
<input checked="" type="checkbox"/>	REL	Released
<input checked="" type="checkbox"/>	MSPT	Material shortage
<input checked="" type="checkbox"/>	PRC	Pre-costed
<input checked="" type="checkbox"/>	GMPS	Goods movement posted
<input checked="" type="checkbox"/>	SETC	Settlement rule created

Target/Actual - Comparison									
<b>Order</b> 1000082 DXTR1904 <b>Order Type</b> PP01 Standard production order <b>Plant</b> DL00 Plant Dallas <b>Material</b> DXTR1904 Deluxe Touring Bike (black) <b>Planned Quantity</b> 265 EA each <b>Target Cost Version</b> 0 <i>Cumulative Data</i> <i>Legal Valuation</i> <i>Company Code Currency/Object Currency</i>									
Cost Element	Cost Element (Text)	Origin	Total Target Costs	Total Actual Costs	Target/actual var.	T/I var(%)	Currency		
720300	Semi-Finished Consumption Expense	DL00/TRWA1904	0,00	59.890,00	59.890,00		USD		
			0,00	59.890,00	59.890,00		USD		
720000	Raw Material Consumption Expense	DL00/TRFR1904	0,00	53.000,00	53.000,00		USD		
720000	Raw Material Consumption Expense	DL00/DGAM1904	0,00	19.875,00	19.875,00		USD		
720000	Raw Material Consumption Expense	DL00/TRSK1904	0,00	13.250,00	13.250,00		USD		
720000	Raw Material Consumption Expense	DL00/TRHB1904	0,00	6.625,00	6.625,00		USD		
720000	Raw Material Consumption Expense	DL00/PEDL1904	0,00	11.925,00	11.925,00		USD		
720000	Raw Material Consumption Expense	DL00/CHAN1904	0,00	2.650,00	2.650,00		USD		
720000	Raw Material Consumption Expense	DL00/BRKT1904	0,00	18.550,00	18.550,00		USD		
720000	Raw Material Consumption Expense	DL00/WDOC1904	0,00	265,00	265,00		USD		
720000	Raw Material Consumption Expense	DL00/PCKG1904	0,00	927,50	927,50		USD		
<b>Raw Materials</b>			0,00	127.067,50	127.067,50		USD		
			0,00	186.957,50	186.957,50		USD		

The confirmation of the completion of manufacturing the finished goods needs to be logged into SAP, as a method of communicating to other business areas that the next steps can be carried out. The time taken in executing the manufacturing process is also logged, which is beneficial to management as they can examine if the execution time is efficient or needs improvement. In this scenario, the execution time took 1 hour from start to finish.

**SAP** Confirmation of Production Order

Goods Movements More ▾

Order: 1000082 Status: REL MSPT PRC GMPS SETC

Material: DXTR1904

Material Descr.: Deluxe Touring Bike (black)

Confirmation Type

Partial confirmation: ☐ Clear Open Reserv.: ☒

Final Confirmation: ☒

Autom. Final Conf.: ☐

Actual Data

	Curr. t/b Conf.	Unit	Confirmed to Date	Planned t/b Conf. Unit
Yield Quantity:	265	EA	0	265 EA
Scrap Quantity:			0	0
Rework Quantity:			0	
Reason for Var.:				
Personnel no.:				

To Be Confirmed Confirmed to Date Planned t/b Conf.

Start Execution: 17.12.2021 22:29:17 18.12.2021

Finish Execut.: 17.12.2021 22:29:17 03.01.2022

Posting Date: 17.12.2021

Confirm. Text: Long Text exists: ☐

The finished bikes are then posted into the finished goods inventory and a goods receipt document is posted for the movement taking place.

**SAP** Goods Receipt Order 1000082 - learn-000 CS21-GBI-904

Object ▾ More ▾

Goods Receipt ▾ Order ▾ GR goods receipt 101

General

Document Date: 17.12.2021 Delivery Note: Doc. Header Text:

Posting Date: 17.12.2021

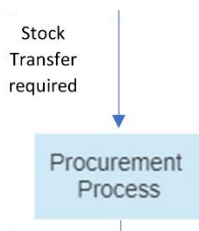
☐ Individual Slip

Line	Mat. Short Text	Wa...	OK	Qty in Unit	EUn	S...	SLoc	Stock Segment	Batch	Valuation Type	M...	D...	Stock Type	Plant
1	Deluxe Touring Bike (black)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	265	EA		FG00				101	+	Unrestricted-Use	Plant Dallas

Finally, the production costs are then settled by the accounting department. With reference to the production order number, month, and year, SAP will automatically process and execute the settlement costs, and then generate a report, taking up no time doing so with little effort on the client-side. The report can then be examined by management to analyse the actual cost against the settled costs and identify any deviations that need attention.

Orders: Actual/Plan/Variance				
<div> <div>Print page formatting on/off</div> <div>Column freeze on/off</div> <div>Options / Office Integration</div> <div>Send report</div> <div>Select</div> <div>Call up report</div> <div>Sort in ascending order</div> <div>Sort in descending order</div> </div>				
<div> <div>Orders: Actual/Plan/Variance</div> <div>Date: 17.12.2021 22:43:06</div> <div>Page: 2 / 2</div> </div>				
<div> <div>Order/Group</div> <div>1000082</div> <div>000001000082</div> </div>				
<div> <div>Fiscal year</div> <div>2021</div> </div>				
<div> <div>Period</div> <div>1 - 12</div> </div>				
Cost Elements	Actual	Plan	Var. (Abs.)	Var. (%)
720000 RM Consumpt Expense	127,067,50	127,067,50		
720300 SF Consumpt Expense	59,890,00	59,890,00		
800000 Labor	6,626,50	5,702,90	923,60	16,20
* Costs	193,584,00	192,660,40	923,60	0,48
741600 Manufac. Output Sett	409,25		409,25	
* Settled Costs	409,25		409,25	
741600 Manufac. output Sett	193,993,25-		193,993,25-	
* Deliveries to Stock	193,993,25-		193,993,25-	
** Balance		192,660,40	192,660,40-	100,00-

## Procurement Stock Transfer:



Stock Overview: Basic List				
<div> <div>Material: DXTR1904</div> <div>Deluxe Touring Bike (Black)</div> <div>Material Type: FERT</div> <div>Finished Product</div> <div>Unit of Measure: EA</div> <div>Base Unit of Measure</div> </div>				
<div> <div>Stock Overview</div> <div>Client/Company Code/Plant/Storage Location/Batch/Special Stock</div> <div>Full</div> <div>US00 Global Bike Inc.</div> <div>DL00 Plant Dallas</div> <div>FG00 Finished Goods</div> </div>				
Stock Overview: Basic List				
Stock	Plant	DL00		
Plant	Stock Type	Stock		
	Unrestricted use	515,000		
	Qual. inspection	0,000		
	Returns	0,000		
	On-Order Stock	0,000		
	Consign ordered	0,000		
	Reserved	0,000		
	Stock trans.(plant)	0,000		
	Transfer (SLoc)	0,000		
	Consign unreser.	0,000		
	Consign qual.insp.	0,000		
	GR Blocked Stock	0,000		
	Cust. inquiries	0,000		
	Cust. quotations	0,000		
	Sales orders	0,000		
	Cust.sched.agmts	0,000		
	Cust. contracts	0,000		
	Deliv. with charge	0,000		

The stock levels of DXTR1s at Dallas have now updated after the production process. However the delivery for the sales order is planned for the Miami plant. Therefore, the procurement process is triggered by the production process to fulfil a stock transfer to the Miami plant's finished goods inventory. There are 95 DXTR1s at the Miami plant, so this process would need to transfer 55 DXTR1s. SAP's functionality eases this process, enabling a 1 step transfer using movement type 301. The Dallas plant along with its finished goods storage location are referenced as the current location of the bikes, and the Miami plant along with its finished goods storage location are referenced as the

destination of the transfer. The DXTR1s are also referenced along with the quantity of DXTR1s, the date of the posting document, and the date of the occurrence of the posting.

Transfer Posting Other - learn-000 CS21-GBI-904

Overview More

Transfer Posting Other TF trfr plant to plant 301

General

Document Date: 17.12.2021 Material Slip:   
Posting Date: 17.12.2021 Doc.Header Text:   
☐ Individual Slip with Inspe.

Transfer Posting Material Quantity Where Partner

From

Material: Deluxe Touring Bike (black)  
DXTR1904  
Plant: Plant Dallas DL00  
Stor. Loc.: Finished Goods FG00  
Spec. Stock: ☐

Dest

Material: Deluxe Touring Bike (black)  
DXTR1904  
DC Miami MI00  
Finished Goods FG00

Qty in Unit: 55 EA

Once delivered, the stock at the Miami plant displays 150 DXTR1s, meeting the sales order requirement of 150. The rest of the fulfilment process can then occur to fulfil the sales order.

SAP

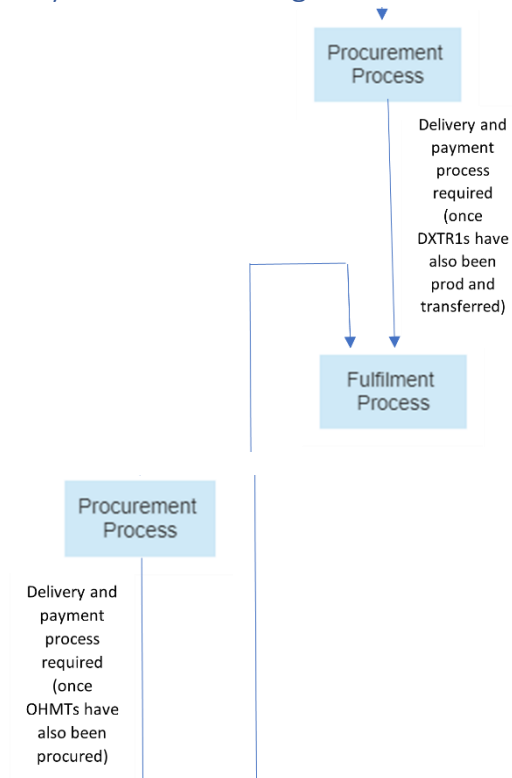
Selection

Material: DXTR1904  
Deluxe Touring Bike (black)

Stock Overview: Basic List

Stock Plant	Plant	MI00
Plant		
Stock Type		Stock
Unrestricted use		150,000
Qual. inspection		0,000
Returns		0,000
On-Order Stock		0,000
Consgrt ordered		0,000
Reserved		0,000
Stck trans. (pint)		0,000
Transfer (SLoc)		0,000
Consgrt unrestr.		0,000
Consgrt qual.insp.		0,000
GR Blocked Stock		0,000
Cust. inquiries		0,000
Cust. quotations		0,000
Sales orders		150,000
Cust.sched.agmts		0,000
Cust. contracts		0,000
Deliv. w/o charge		0,000
Schd.for.delivery		0,000
Rcpt.reservation		0,000

## Fulfilment Delivery and Payments Processing:



The fulfilment process is triggered to continue by the procurement process after the procurement of DXTR1s and OHMTs at the Miami plant. The continuation of this process begins with the creation of the outbound delivery for the sales order specifying the customer it is delivered to (BCB), and the date range for the delivery. SAP also allows for the priority of the delivery to be set if necessary, which is beneficial for Speed Gear in circumstances where a customer has requested a tight schedule for their sales order. Once the delivery is created, the sales document will disappear from the list of outbound deliveries that can be created.

Employees can then track the status of and manage the outbound delivery. Currently picking and the goods issued haven't been processed.

<input type="checkbox"/> 80000090	17.02.2022 Normal item (02)	Not Yet Processed (A)	Not Relevant	Not Yet Processed (A)
-----------------------------------	-----------------------------	-----------------------	--------------	-----------------------

Picking is processed by setting the picking location and setting the quantity picked of the two goods.

Delivery Item 1 of 2

Delivery 80000090 /

Delivery Item 000010

Sales Order: 89

Sales Order Item: 000010

Item Type: Standard Item (TAN)

Original Delivery Quantity: 150 EA

Picking Quantity: 150 EA

Delivery Quantity: 150 EA

Conversion Rate: 1 EA : 1 EA

Base Unit Delivery Quantity: 150 EA

Material: Deluxe Touring Bike (black) (DKTR1904)

Gross weight: 1.276.500 G

Net Weight: 1.276.500 G

Volume: 0

Plant: DC Miami (M00)

Storage Location: FG00

Storage Bin: Finished Goods

Material Availability: 17.02.2022

Serial Numbers (0)

☐ Serial Number

Equipment

Unique Item Identifier

No serial numbers found.

Delivery 80000090 /

Delivery Item 000020

Sales Order: 89

Sales Order Item: 000020

Item Type: Standard Item (TAN)

Original Delivery Quantity: 30 EA

Picking Quantity: 30 EA

Delivery Quantity: 30 EA

Conversion Rate: 1 EA : 1 EA

Base Unit Delivery Quantity: 30 EA

Material: Off Road Helmet (OHMT1904)

Gross weight: 450 OZ

Net Weight: 450 OZ

Volume: 0

Plant: DC Miami (M00)

Storage Location: TG00

Storage Bin: Trading Goods

Material Availability: 17.02.2022

Serial Numbers (0)

☐ Serial Number

Equipment

Unique Item Identifier

No serial numbers found.

The status of the picking is then updated to completely processed and the delivery status is updated to Ready to Post GI, signifying that the goods issue is ready to post for this sales order.

Pick Outbound Delivery

Delivery: 80000090

Delivery Header

Delivery: 80000090

Actual GI Date: dd.MM.yyyy

Planned GI Date: 17.02.2022

Gross Weight: 45.477.249 OZ

Net Weight: 45.477.249 OZ

Picking Status: Completely Processed

Confirmation Status: Not Relevant

2 of 2 Picking

GI Ready

0

Status: Ready to Post GI

Planned GI Date: 17.02.2022

Gross Weight: 45.477.249 OZ

Net Weight: 45.477.249 OZ

Volume: 0

Priority: Normal Item

Ship-To Party: Big City Bikes (25106)

Address: 350 Columbia Rd NW, Washington DC 20009, USA

Post GI

Delete Delivery

Save

Next the goods issue is posted to BCB, simply by entering the GI date and pressing the Post GI button, which will then record into the system that the goods have been delivered.

80000090	17.02.2022	Normal Item (02)	Completely Processed (C)	Not Relevant	Completely Processed (C)
----------	------------	------------------	--------------------------	--------------	--------------------------

The accounting department then see that the delivery has been posted, and create an invoice for the customer. Below is the billing document and customer invoice produced for this sales order.

**Data Entry View**

Document Number: **90000082** Company Code: **US00** Fiscal Year: **2021**  
Document Date: **17.12.2021** Posting Date: **17.12.2021** Period: **12**  
Reference: **904** Cross-Comp.No.:   
Currency: **USD** Texts Exist: ☐ Ledger Group:

Co...	Item	Key	S...	Account	Description	Amount	Curr.	Tx
US00	1	01		25106	Big City Bikes	406.395,00	USD	
	2	50		600001	Sales revenue	450.000,00-	USD	
	3	50		610000	Tax on sls/purch.	50,00-	USD	
	4	40		610000	Tax on sls/purch.	45.005,00	USD	
	5	50		600001	Sales revenue	1.500,00-	USD	
	6	40		610000	Tax on sls/purch.	150,00	USD	

The final step of the fulfilment process is posting the customer receipt. Here the date, month, city, BCB identifier, and amount being paid are all inserted, and then the customer receipt is posted.

**Payment**

Payment

General Information

\*Company Code: **US00**  
\*Posting Date: **17.12.2021**  
\*Journal Entry Date: **17.12.2021**  
Value Date: **17.12.2021**  
Reference:   
Period: **12**  
\*Journal Entry Type: **DZ (Customer Payment)**

Bank Data

\*GL Account: **100000**  
House Bank/Account ID:   
\*Amount: **406.395,00** **USD**  
Fees: **0,00**  
Assignment:   
Exchange Rate:   
Amount/CCode Currency: **0** **USD**

Open Item Selection

Account Type/Account ID: **Customer** **25106**  
Payment Reference:   
Use this section to enter information (such as 1 number, customer number, payment reference payment) to help the system find the right item



**Post Incoming Payments**

Posting Date: 17.12.2021  
 \*Journal Entry Date: 17.12.2021  
 Value Date: 17.12.2021  
 Reference:  
 Period: 12  
 \*Journal Entry Type: DZ (Customer Payment)

House Bank/Account ID:  
 \*Amount: 406.395,00 USD  
 Fees: 0,00  
 Assignment:  
 Exchange Rate:

Proposed Items | Post to G/L Account | Post on Account | Attachments (0) | Notes (0)

Open Items (1) | Standard

Compa...	Account	Journal Entry	Journal...	Item Text	Journal Entry D...	Net Due Date	Amount (USD)	Assignment	Clear
US00	25106	90000082	RV		17.12.2021	17.12.2021	406.395,00	0090000082	Clear >>

The journal entry can then be posted. This document can then be displayed by those involved in the business process and by management. Speed Gear management can use information as such to analyse the amount paid by customers and the relevant information surrounding the payment such as the date and goods bought,

Notes (0)

**Success**

Journal entry 1400000079 (2021, US00) successfully posted

Display | Post Next Payment

...	Net
2021	17.12.2021
	406.395,00
	0090000082

**Journal Entry (1400000079) - Entry View**

Header | Attachments (0) | Notes (0) | Related Documents (0)

Journal Entry Date: 17.12.2021  
 Posting Date: 17.12.2021  
 Posting period: 12 / 2021  
 Journal Entry Type: DZ (Customer Payment)  
 Created: by CS21-GBI-904 on 18.12.2021

Company Code: US00 (Global Bike Inc.)  
 Transaction Currency: USD  
 Company Code Crpy:  
 Company Code Crpy:  
 Company Code Crpy:  
 Company Code Crpy:  
 Company Code Crpy:  
 Company Code Crpy:  
 Company Code Crpy:  
 Company Code Crpy:  
 Company Code Crpy:

Reference:  
 Ref. Document Type: BKPF (Actg doc.direct inpt)  
 Header Text:  
 Reference 1:  
 Reference 2:

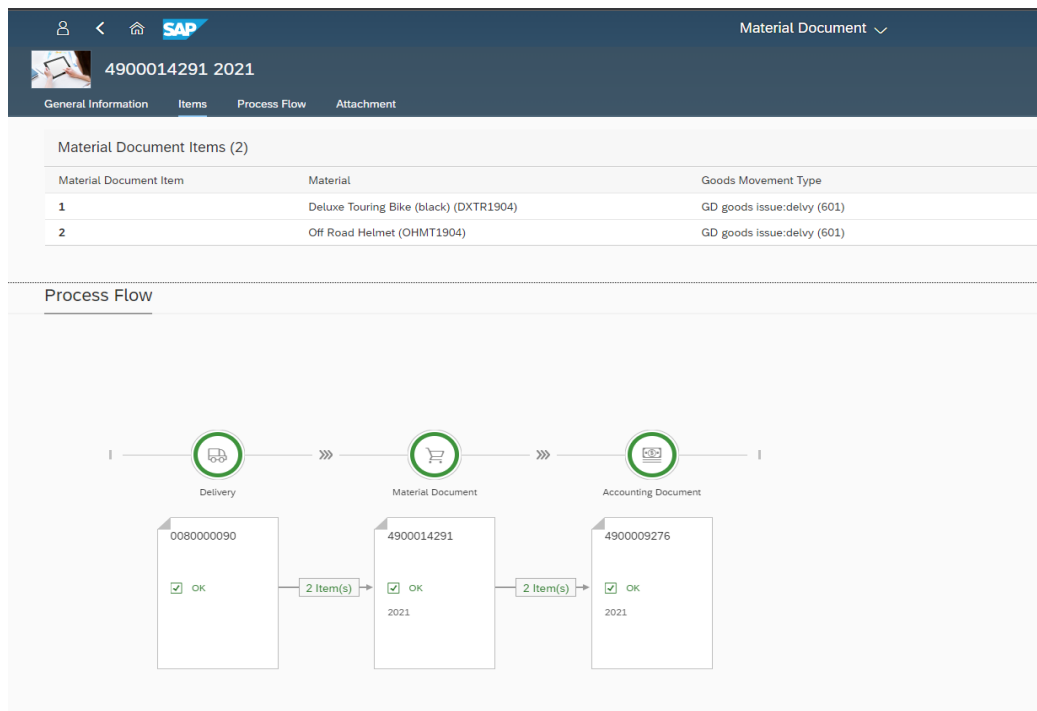
Open Items (2) | Standard

Posting View Item	G/L Account	Profit Center	Debit
00001	100000 (Bank)		406.395,00 USD
00002	110000 (Trade Receivables)		0,00 USD

ax (M) | Standard

On completion of the sales order, SAP generates a report displaying the entire document flow of Big City Bike's sales order where all the documents that were used are linked. The screenshot below

shows the directional links of the delivery, material and accounting documents used in the Big City Bikes sales order. This is beneficial since it can give management at Speed Gear an overview of the entire fulfilment process, enabling them to examine each document without having to spend time manually searching for each one that was involved.



### Recommendations for implementing the ERP SAP System for Speed Gear:

Speed Gear currently meets customer demand through storing large volumes of raw materials and finished bikes in inventory. This manufacturing plan is very costly, since it runs into the risk of products being manufactured that may not be sold, thus leading to a loss in terms of resource consumption expenses (wasted material and labour costs). Furthermore, Speed Gear does not have any demand forecasting methods in place to avoid not meeting customer demand for specific products. This could potentially lead to delivery delays for customers. Therefore, Speed Gear would benefit from implementing Just-In-Time (JIT) manufacturing to mitigate these issues.

As defined by Kootanaee and Babu, JIT manufacturing is a “philosophy applied in manufacturing which involves having the right items of the right quality and quantity in the right place at the right time” (2013, p.8). Applying JIT implies products only being manufactured and procured in response to real-time customer demand and demand forecasting based on purchasing patterns. This is known as demand-pull production since demand drives manufacturing. ERP SAP offers MRP and MRP II when it comes to production planning, where MRP is a method for managing dependent materials in correspondence with a demand schedule, and MRP II is a function which outputs the investment costs needed to carry out MRP. Speed Gear would benefit from utilizing such tools to fulfil JIT since production planning increases the likelihood that the necessary materials to meet the demand of finished goods will be available, keeping the production process efficient. The production consumption expenses are also made transparent through running MRP II, so management can analyse costs and streamline the production process further if need be.

However, a limitation of JIT when compared to Speed Gear's initial approach is that having large volumes of inventory provides safety for times of inaccurate demand forecasts. For example, the recent COVID pandemic caused a lockdown throughout 2020 which led to a shortage of materials due to many suppliers having to close to comply with legislation. The magnitude of the pandemic could not be predicted. In this instance, applying JIT would likely lead to a shortage. Therefore, a recommendation for Speed Gear is to store a small-to-medium volume of raw materials and finished bikes as demand forecasts can never be 100% accurate.

Another recommendation for implementing JIT manufacturing is for Speed Gear to work in close liaison with vendors in its supply chain. A recent article examining the effects of COVID on supply chain management (Pisch, 2020) states that it is precisely due to the nature of an uncertain world that two firms would benefit from working closely together so that they can adapt in a coordinated way, leading to less delays when it comes to procurement and production. Therefore, a recommendation for Speed Gear would be to maintain close communication with suppliers, and to share demand forecasts so that both they themselves and their suppliers can adapt to changes in demand. Also, an ERP system in place would provide Speed Gear the ability to provide direct contact with vendors through inquiry and quotation documents, as well as payments that can be sent and received in real-time.

In a research paper investigating the key areas of success vs failures for SAP implementations (Gargeya, 2005), it was found that a lack of internal organizational readiness was the most important factor determining failure of SAP implementation in 15 companies. It is therefore recommended that Seed Gear invest a significant amount of time on preparation of ERP implementation. For medium sized companies such as Speed Gear, the estimation of total costs to implement an ERP system is \$10-20 million and it would take an estimated 2 years according to Monk and Wagner (2013, p.37).

For all implementation cases, there is a roadmap that can be extracted for successful implementation strategies. Monk and Wagner (2013, p.206) define this roadmap in 5 stages. The first stage is project preparation which consists of organising a team, gathering software and hardware requirements, and identifying the project scope. The second is a business blueprint where the business process requirements would be documented in order to tailor SAP for Speed Gear specifically. In a research paper investigating the key areas of success vs failures for SAP implementations (Gargeya, 2005), it was found that internal readiness was the most important factor contributing to the success of implementation for 29 companies. It is therefore recommended that Seed Gear invest a significant amount of time on project preparation and developing a thorough blueprint.

The third stage is realisation where the project team and hired consultants work together to implement the system in correspondence with the blueprint. In a case study regarding the cause of FoxMeyer Drug's bankruptcy (1999, p. 225), a conclusion was that FoxMeyer should have ensured that knowledge was transferred from the consultants implementing the ERP system to management and employees of FoxMeyer in order to acquire in-house skills to maintain the system once consultant had left. It is therefore recommended that Speed Gear require their consultants to work in close liaison with the project team and employees so that knowledge can be transferred to them. This would avoid future costs of re-hiring specialists.

The fourth is final preparation where system testing occurs, and a helpdesk is set up for supporting employees in their training on the new system. Finally, the fifth stage is go-live and support where the system would actually begin being used for business processes by Speed Gear whilst also supporting employees with real-time helpdesk support as well as monitoring, testing, and adjusting

the system accordingly. The availability of support set up by those at the top at Speed Gear as well as the relationship they have with employees is a significant factor for determining the success of ERP implementation. For example, a case study regarding the implementation of ERP in Rolls-Royce (Yusuf, 2004) found that technical training and support for staff at Rolls-Royce was vital to the overall success of implementing ERP. It was also found that. Furthermore, it was found that managing relationships and offering support to staff from top-level management also played a vital role. For Speed Gear, it is therefore essential that costs are dedicated towards providing excellent employee training and support through hiring competent helpdesk staff.

### Conclusion:

To conclude, it would be an appropriate decision for Speed Gear to implement an ERP SAP System as their business processes are cross-functional processes which can be efficiently performed in SAP. Speed Gear's use of data and their business processes are repetitive. Speed Gear have a network of trusted suppliers to buy materials from and a network of trusted business partners they regularly sell to. They can take advantage of this and set up master data for these vendors and business partners once so that their master data can be called by their corresponding identifier to automate a lot of the business processes, improving the efficiency. Implementing this strategy will save time in the long-term once training and implementation has occurred as well as benefit customer experience through a decrease in delay time. An appropriate response for to reduce inventory levels is for Speed Gear to implement JIT manufacturing in order to lower inventory levels, saving costs on storage space and wasted materials. When implementing the ERP SAP system, Speed Gear should carefully plan the implementation, acquire knowledge regarding its use, and provide support with for staff using the system.

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