

BUSINESS INTELLIGENCE SUITE INTEGRATION FOR HEXAGON-3D COMPANY

SPECIFICATION REPORT




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1. PROJECT OVERVIEW

Project Name	Business Intelligence (BI) Suite Integration Project
Project Company	Hexagon-3D Company 
Project Purpose	Hexagon-3D company would like to improve the process of relating and managing their customer engagement, automate the process of getting insights and analysis based on the historical information of their customers. Currently there is no aggregated platform to engage their customers and efficiently track cases of customers plight to resolve in time. Also, it takes too long to generate data insights for the management. Thus, making their business process reactive.
Project Description	The business intelligence team has been tasked to provide a scalable, low-cost business intelligence suite with a short time to deploy. The proposed BI suite to be developed for this project will provide insights to the business performance and customer support in real time. This solution will be used to setup a central source of intelligence, create instant knowledge on the company's workforce and supply chain, enhance flexibility of the company to collaborate anywhere and on any device. The application will also consolidate some of the business processes to support the digital transformation strategy of the company
Proposed Start Date	June 01, 2020
Proposed End Date	June 15, 2020
Prepared By	<ul style="list-style-type: none">▪ Oluwatobi Ekundayo▪ Esther Oseikhuemen Edeawe-Daniel▪ Kamesh Munuswamy
Role	Business Intelligence Team
Document Version	1.0
Date Prepared	April 19, 2020

2. BACKGROUND INFORMATION

Hexagon-3D Company is a Dublin-based company providing sales of 3D printers, software installations and routine maintenance to colleges, organizations and individuals. The company was founded in 2013 with 5 employees and currently operates with a staff strength of 48, across two countries (Ireland and United Kingdom). Business operations commenced fully by January 2015. Hexagon-3D places high priority on providing the best products on time to their customers.

Marketplace

Hexagon-3D operates as a retail company in the printing and information technology industry. The company is fast becoming one of the largest retail stores for 3D printers in Ireland, as they are known for their readily available products, up-to-date technology and customer friendly prices. The 3D printing space is mostly for a niche market and its rapidly growing. It is expected to be worth over US\$42.9 billion by 2025.

3. PROJECT SCOPE

Hexagon 3D aims at improving their customer relations and business processes as they seek to expand to other countries in Europe and Africa. They intend to change their manual system to an agile business process. To achieve this digital transformation, the management has decided to optimize the Enterprise Resource Planning (ERP) system and Customer Relations Management (CRM) system of the company. This will improve efficiency, collaborations workflow, customer service and revenue in the long run.

3.1 Project Objectives

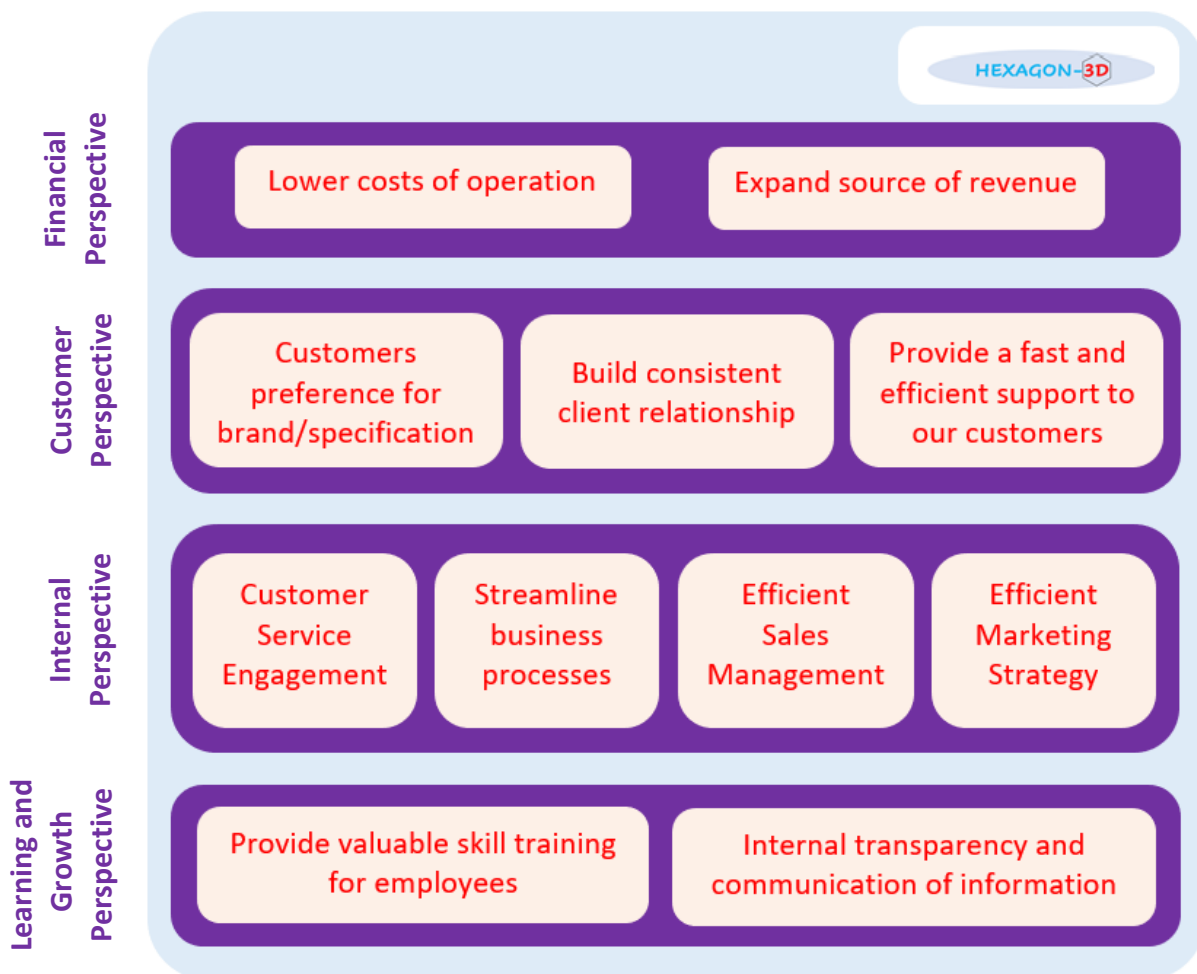
- To provide a unified system to aid communication (enhancing accessibility and transparency of information) across key business processes of the company
- To increase efficiency in customer engagement and support
- To provide timely reports and dynamic dashboards to aid strategic business planning
- To optimize the overall business process and monitor some key business performance

3.2 Balance Scorecard

The balance scorecard shown below is a designed strategy map to highlight the important objectives in each perspective for the leadership of the company.

- **Financial Perspective:** This is the first section of the balance scorecard. It is concerned with financial metrics such as sales, expenditures and income. It mainly focusses on revenue with a goal to increase the number of business and broaden the spectrum of revenue

- **Customer Perspective:** This is the second section of the balance scorecard. This part is concerned with anticipating the customers expectation and perception of the products and services of the company.
- **Internal Perspective:** This is the third section of the balance scorecard. This part focuses on addressing key business processes of the company in other to satisfy the customer.
- **Learning and Growth Perspective:** this is the last section of the balance scorecard. Its focused on the things the company needs to improve or learn to become successful. The employees benefit here as they gain new knowledge for the development and growth of the company and themselves.



3.3 Project Budget

Expense Breakdown	Amount
Microsoft Dynamic 365 Customer service	€ 1,150 per year
Microsoft Dynamic 365 Sales	€ 1,150 per year
Microsoft Power BI	€ 200 per year

4. SYSTEM DESIGN

4.1 Proposed Solution Description

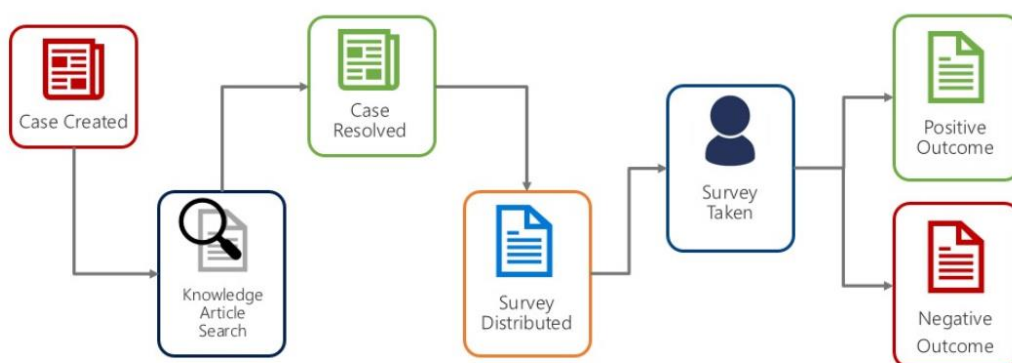
Microsoft Dynamics 365 is strongly recommended to better manage operations and enhance the company's ability to analyse customer data and share it across the front-office functions of marketing, sales and customer service. The platform and its intelligent business applications are built on four building blocks for digital transformation - modern, unified, intelligent, and adaptable.

- **Microsoft Dynamics 365 Customer Service** delivers fast, personalized service and makes it easy for customer service agents to meet rising customer expectations. This service enables end-to-end self-service for the customer and agent-assisted experiences on the customer's preferred terms, devices and channels, creating a seamless customer experience.
- **Microsoft Dynamics 365 Sales** leverages on the embedded intelligence to manage sales opportunities and convert more leads. Also, the company's sales lifecycle process is managed better from start to finish. An overview of what's happening with a customer is all captured all in one place.
- **Microsoft Power BI** provides an interface to turn raw data (excel workbook or local database) into interactive visualizations and business intelligence capabilities with an interface simple enough for end users to create their own reports and dashboards. Power BI is also robust and enterprise-grade, with capabilities for extensive modelling and real-time analytics.

4.2 Process Flow Diagram

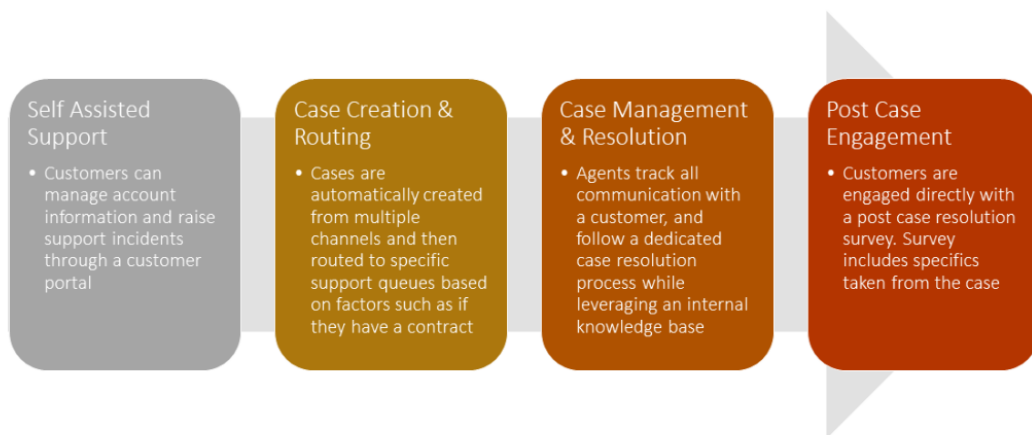
- **Customer Service: Using Dynamics 365 Customer Service**

Process Flow for Customer Service Engagement



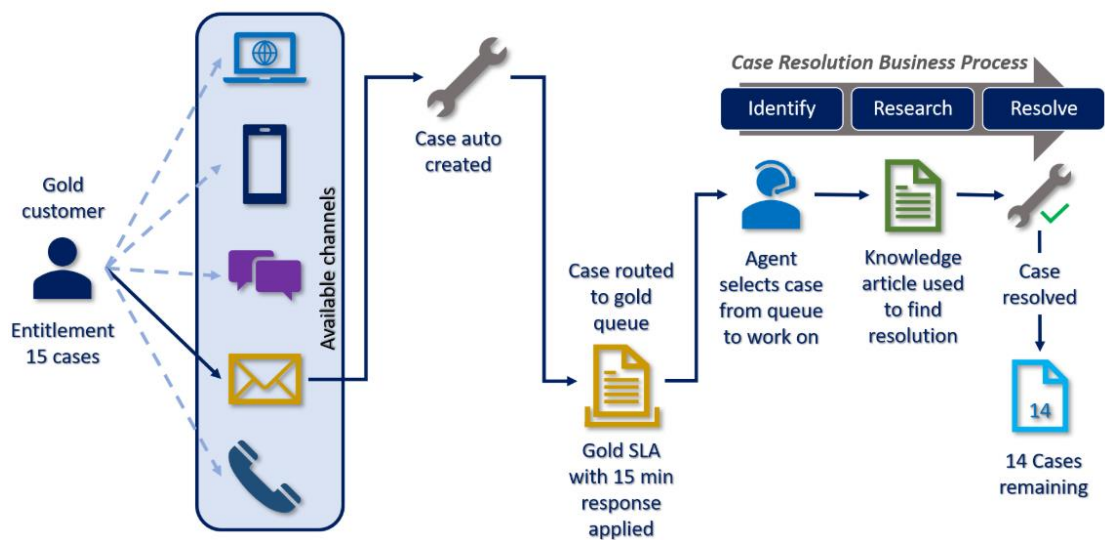
[4]

Flow of Customer Support Journey



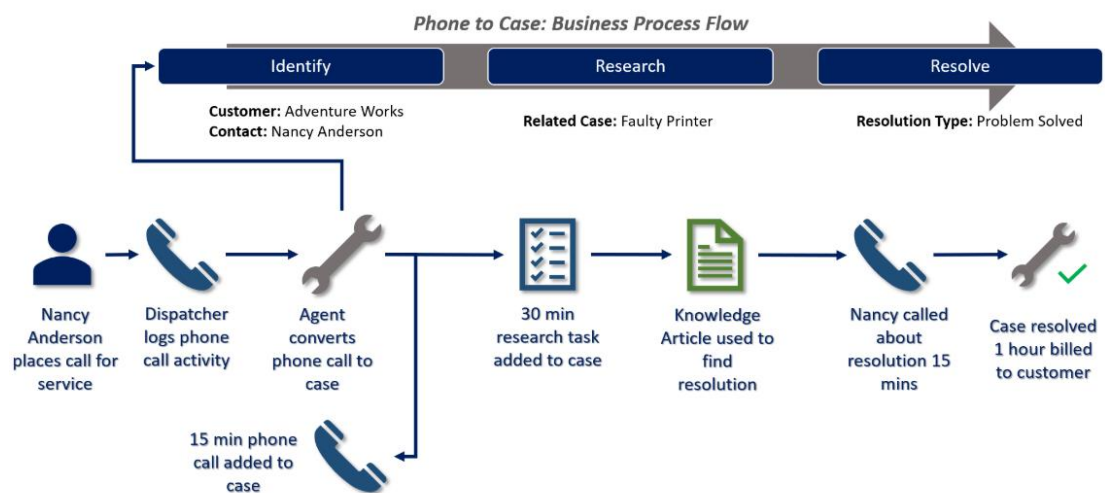
[4]

Breakdown of Case Management with Microsoft Dynamics 365 Customer Service



[4]

Workflow of Phone Call to Case Lifecycle



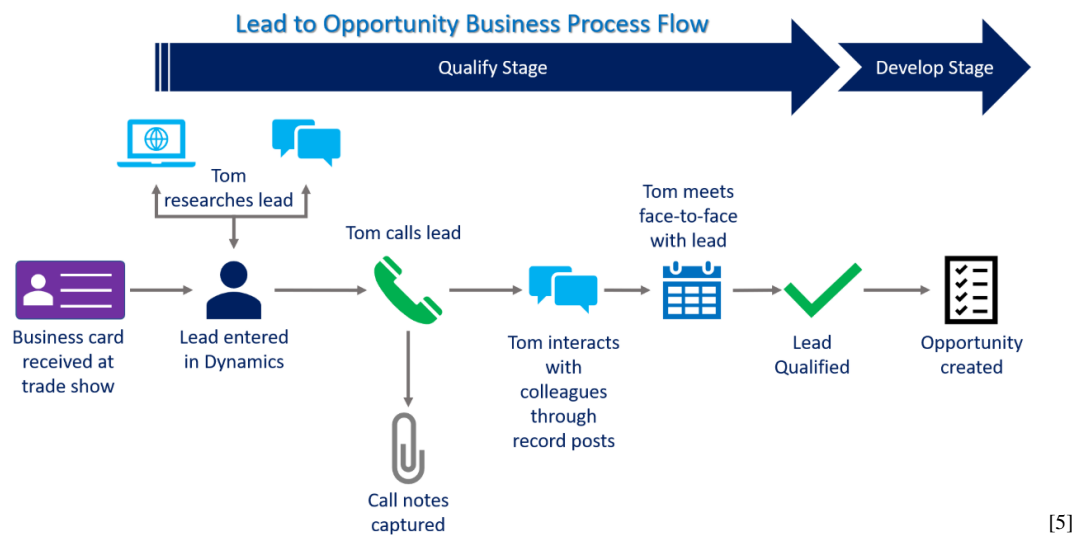
[4]

- **Sales: Using Dynamics 365 Sales**

Overview of the Sales Process Flow

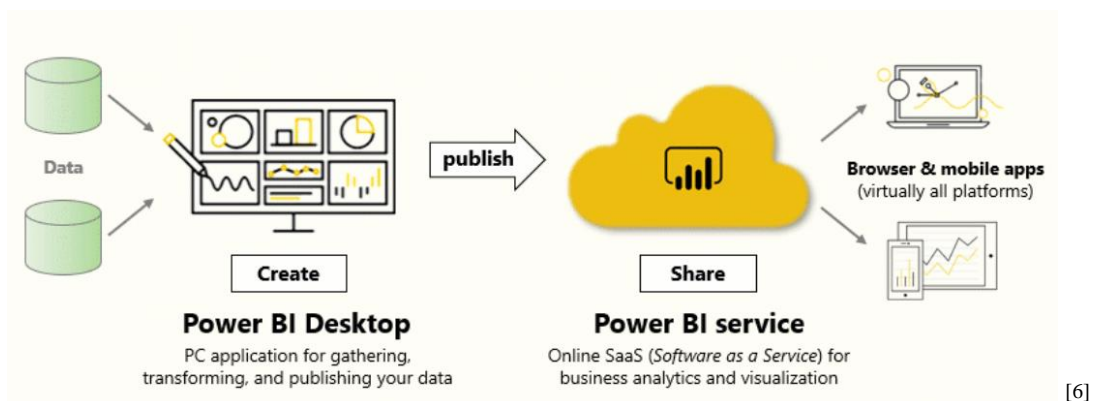


Breakdown of the Sales Business Process Flow



- **Business Analytics: Using Power BI**

Process flow for the analytics platform



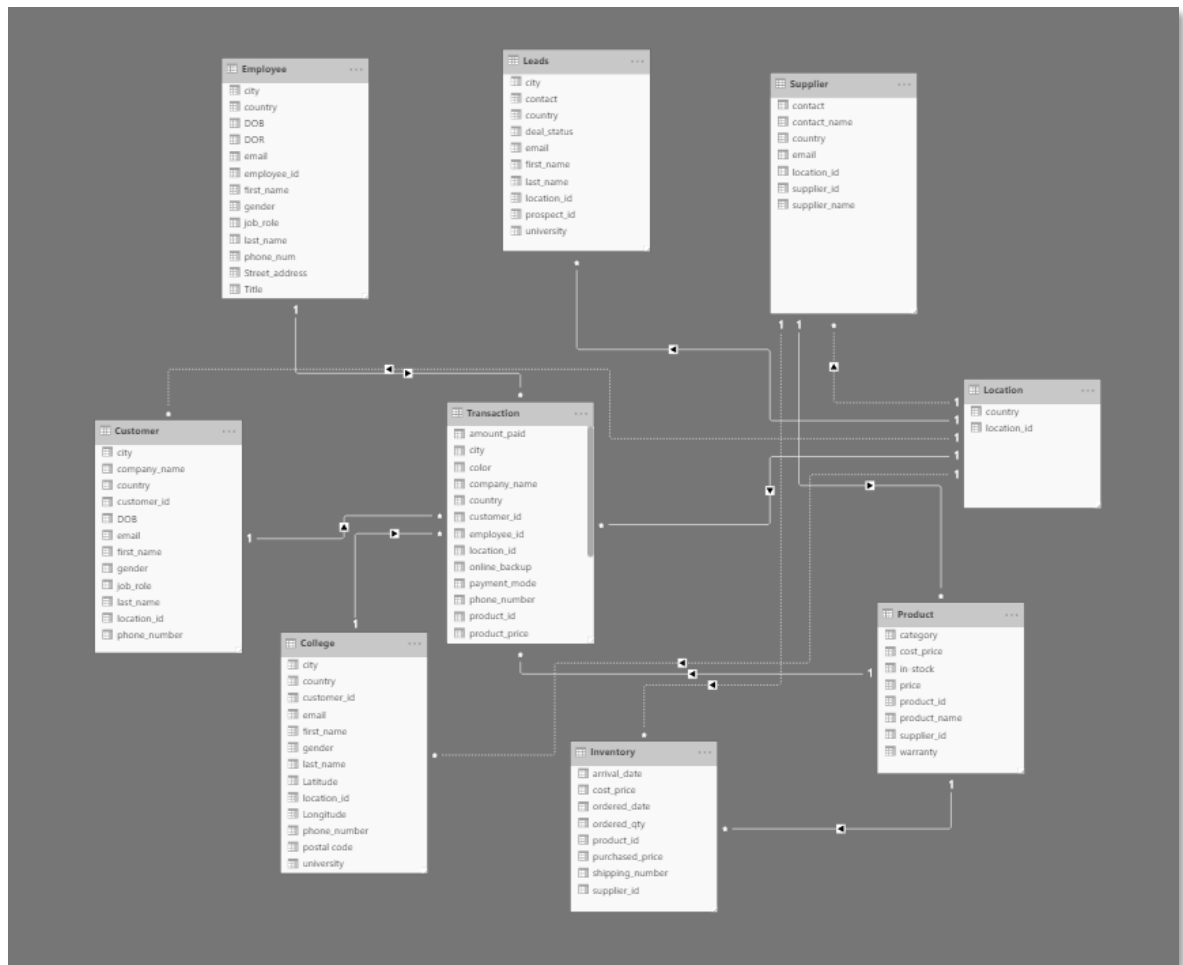
4.3 Data Dictionary

The company possesses various records, capturing historical information from 2015 to 2020. Based on these records the database of the company was revamped. The tables of the database are highlighted below:

1. **Employee:** This table contains relevant information about the employees of the company across the two (2) countries of operation. The unique primary key for this table is represented as “employee_id”.
2. **Supplier:** This table contains relevant information about the suppliers of the company’s products (3D printers and materials). The unique primary key for this table is represented as “supplier_id”.
3. **Customer:** This table contains relevant information of the customers (individuals/researchers). The unique primary key for this table is represented as “customer_id”.
4. **College:** This table contains relevant information about the customers (colleges/universities). This category of customers is very important to the business, as they generate quality revenue for the business. The unique primary key for this table is represented as “customer_id”.
5. **Transaction:** This table contains relevant information about the day-to-day transactions carried out with the company. This table also shows if customers required and paid for tech support at the point of purchase. The unique primary key for this table is represented as “transaction_id”.
6. **Product:** This table contains relevant information of the available products of the company and its corresponding prices. The unique primary key for this table is represented as “product_id”.
7. **Inventory:** This table contains relevant information about the ordered products, quantity, purchase price etc. The unique primary key for this table is represented as “shipping_number”.
8. **Leads:** This table contains relevant information about the target customers, the company seeks to makes to. The unique primary key for this table is represented as “prospect_id”.
9. **Location:** This table contains relevant information about the location (country) of the customers, suppliers and business prospects. The unique primary key for this table is represented as “location_id”.

4.4 Database Schema Diagram

Database schema diagram, which can also be referred to as entity-relationship diagram illustrates below the relationships among entities/tables stored in the database.



4.5 Database Design

The structure, data type and data size for the tables in the database are shown below

College Table		
Name	Type	Width
customer_id	String	14
first_name	String	12
last_name	String	13
email	String	31
gender	String	6
city	String	13
country	String	14
university	String	70
phone_num...	String	12
location_id	String	10
postalcode	String	4
Latitude	Numeric	10
Longitude	Numeric	11

Employee Table		
Name	Type	Width
employee_id	String	10
title	String	3
first_name	String	10
last_name	String	11
email	String	29
job_role	String	28
gender	String	6
phone_num	String	12
DOB	Date	10
Street_addr...	String	22
city	String	13
country	String	14
DOR	Date	10

Customer Table		
Name	Type	Width
customer_id	String	14
first_name	String	13
last_name	String	21
gender	String	6
email	String	36
DOB	String	10
phone_num...	String	12
location_id	String	10
city	String	19
country	String	14
job_role	String	36
company_n...	String	13

Leads Table		
Name	Type	Width
prospect_id	String	6
first_name	String	11
last_name	String	13
university	String	102
deal_status	String	10
email	String	31
contact	String	12
location_id	String	10
city	String	21
country	String	12

Inventory Table		
Name	Type	Width
shipping_nu...	String	14
product_id	String	9
purchased_...	Numeric	5
cost_price	Numeric	3
supplier_id	String	6
ordered_qty	Numeric	3
ordered_date	String	10
arrival_date	Date	10

Transaction Table		
Name	Type	Width
transaction_id	String	15
customer_id	String	14
product_id	String	9
amount_paid	Numeric	4
product_price	Numeric	3
quantity	Numeric	2
purchase_d...	String	10
purchase_ti...	String	5
employee_id	String	10
company_n...	String	13
color	String	6
payment_m...	String	25
phone_num...	String	12
location_id	String	10
city	String	19
country	String	14
warranty	String	7
tech_support	String	3
techsupport...	Numeric	2
sub_charge	Numeric	2
online_backup	String	3

Product Table		
Name	Type	Width
product_id	String	9
product_name	String	34
category	String	13
price	Numeric	3
warranty	String	7
supplier_id	String	6
instock	Numeric	2
cost_price	Numeric	3

Supplier Table		
Name	Type	Width
supplier_id	String	6
supplier_na...	String	12
contactno	String	18
country	String	7
location_id	String	10
contact	String	13
email	String	18

Location Table		
Name	Type	Width
location_id	String	10
country	String	14

5. PROJECT REQUIREMENTS

5.1 Functional Requirements

- The system should be capable of tracking customer historical information
- System should be able to provide timeline, status, visual insight and trend of activities
- System should enhance communication across the business

5.2 High-Level and Analytical Requirements

- Quality reports and dashboards to show key business insights
- Accessibility: Reports should be accessible via various platforms at any time
- Availability: The system should be available for operations with little or no down time
- Interpretability: Use of appropriate visuals to correctly depict business insights
- Colour distinction & less ambiguity in the visualizations

5.3 Non-Functional Requirements

- Usability: The system should be relatively simple to understand and operate
- Reliability: The system should capable of working little or no operational errors
- Scalability: The application must be capable of being scalable without a negative influence on performance
- Performance: Responsiveness of the system should be of good speed
- Security: The system & customers data should be protected from unauthorised access

6. DATA ANALYSIS

6.1 Business Insights

After carrying out data transformation on the historical data of the company, some analysis and insights were generated based on the data. This was done using **Microsoft Power BI** application.

s/n	Insights	Visualization																																																																														
1	There was more revenue generated in Ireland than in United Kingdom (UK)	<p>Total revenue by country</p> <table><thead><tr><th>country</th><th>Total revenue</th></tr></thead><tbody><tr><td>Ireland</td><td>€1.37M</td></tr><tr><td>United Kingdom</td><td>€0.83M</td></tr></tbody></table>	country	Total revenue	Ireland	€1.37M	United Kingdom	€0.83M																																																																								
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2	The company experienced more sales in Year 2019	<p>Total revenue by Year</p> <table><thead><tr><th>Year</th><th>Total revenue</th></tr></thead><tbody><tr><td>2015</td><td>€0.36M</td></tr><tr><td>2016</td><td>€0.42M</td></tr><tr><td>2017</td><td>€0.40M</td></tr><tr><td>2018</td><td>€0.41M</td></tr><tr><td>2019</td><td>€0.52M</td></tr><tr><td>2020</td><td>€0.09M</td></tr></tbody></table>	Year	Total revenue	2015	€0.36M	2016	€0.42M	2017	€0.40M	2018	€0.41M	2019	€0.52M	2020	€0.09M																																																																
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3	Benchmark revenue performance showed that more sales were made in May, July and November	<p>Revenue performance per month by year</p> <table><thead><tr><th>Month</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th></tr></thead><tbody><tr><td>January</td><td>€32K</td><td>€35K</td><td>€30K</td><td>€32K</td><td>€35K</td></tr><tr><td>February</td><td>€30K</td><td>€32K</td><td>€28K</td><td>€30K</td><td>€32K</td></tr><tr><td>March</td><td>€32K</td><td>€35K</td><td>€30K</td><td>€32K</td><td>€35K</td></tr><tr><td>April</td><td>€30K</td><td>€32K</td><td>€28K</td><td>€30K</td><td>€32K</td></tr><tr><td>May</td><td>€35K</td><td>€38K</td><td>€32K</td><td>€35K</td><td>€38K</td></tr><tr><td>June</td><td>€32K</td><td>€35K</td><td>€30K</td><td>€32K</td><td>€35K</td></tr><tr><td>July</td><td>€35K</td><td>€38K</td><td>€32K</td><td>€35K</td><td>€38K</td></tr><tr><td>August</td><td>€32K</td><td>€35K</td><td>€30K</td><td>€32K</td><td>€35K</td></tr><tr><td>September</td><td>€30K</td><td>€32K</td><td>€28K</td><td>€30K</td><td>€32K</td></tr><tr><td>October</td><td>€32K</td><td>€35K</td><td>€30K</td><td>€32K</td><td>€35K</td></tr><tr><td>November</td><td>€35K</td><td>€38K</td><td>€32K</td><td>€35K</td><td>€38K</td></tr><tr><td>December</td><td>€30K</td><td>€32K</td><td>€28K</td><td>€30K</td><td>€32K</td></tr></tbody></table>	Month	2015	2016	2017	2018	2019	January	€32K	€35K	€30K	€32K	€35K	February	€30K	€32K	€28K	€30K	€32K	March	€32K	€35K	€30K	€32K	€35K	April	€30K	€32K	€28K	€30K	€32K	May	€35K	€38K	€32K	€35K	€38K	June	€32K	€35K	€30K	€32K	€35K	July	€35K	€38K	€32K	€35K	€38K	August	€32K	€35K	€30K	€32K	€35K	September	€30K	€32K	€28K	€30K	€32K	October	€32K	€35K	€30K	€32K	€35K	November	€35K	€38K	€32K	€35K	€38K	December	€30K	€32K	€28K	€30K	€32K
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6	More Customers were seen to have purchased more of the Resin type of 3D Printers.	<p>Total revenue by product category</p> <table><thead><tr><th>Product Category</th><th>Revenue (€K)</th></tr></thead><tbody><tr><td>Resin</td><td>844</td></tr><tr><td>ABS</td><td>750</td></tr><tr><td>PLA & ABS</td><td>606</td></tr></tbody></table>	Product Category	Revenue (€K)	Resin	844	ABS	750	PLA & ABS	606																												
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7	The product with the highest revenue generated is Form 3L SLA 3D Printer	<p>Total revenue by product</p> <table><thead><tr><th>Product</th><th>Revenue (€K)</th></tr></thead><tbody><tr><td>Form 3L SLA 3D printer</td><td>275</td></tr><tr><td>Form 3 SLA 3D printer</td><td>186</td></tr><tr><td>UP Mini 2 3D printer</td><td>186</td></tr><tr><td>Ultimaker S5 Pro Bundle...</td><td>182</td></tr><tr><td>UP Plus 2 3D printer</td><td>147</td></tr><tr><td>UP Box+ 3D printer</td><td>141</td></tr><tr><td>Form 2 SLA 3D printer</td><td>128</td></tr><tr><td>Ultimaker 2 3D printer</td><td>115</td></tr><tr><td>Ultimaker S3 3D printer</td><td>113</td></tr><tr><td>Ultimaker 3 3D printer</td><td>104</td></tr><tr><td>Form 1 SLA 3D printer</td><td>97</td></tr><tr><td>ABS Material</td><td>95</td></tr><tr><td>UP 300 3D printer</td><td>95</td></tr><tr><td>Ultimaker S5 3D printer</td><td>92</td></tr><tr><td>UP Plus Mini 2 3D printer</td><td>86</td></tr><tr><td>Fuze 1 SLA 3D printer</td><td>84</td></tr><tr><td>Resin Material</td><td>74</td></tr></tbody></table>	Product	Revenue (€K)	Form 3L SLA 3D printer	275	Form 3 SLA 3D printer	186	UP Mini 2 3D printer	186	Ultimaker S5 Pro Bundle...	182	UP Plus 2 3D printer	147	UP Box+ 3D printer	141	Form 2 SLA 3D printer	128	Ultimaker 2 3D printer	115	Ultimaker S3 3D printer	113	Ultimaker 3 3D printer	104	Form 1 SLA 3D printer	97	ABS Material	95	UP 300 3D printer	95	Ultimaker S5 3D printer	92	UP Plus Mini 2 3D printer	86	Fuze 1 SLA 3D printer	84	Resin Material	74
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8	Payment of purchased products was mostly done via electronic check	<p>Revenue by payment mode</p> <table><thead><tr><th>payment_mode</th><th>Revenue (€K)</th><th>Percentage (%)</th></tr></thead><tbody><tr><td>Electronic check</td><td>768</td><td>34.89</td></tr><tr><td>Bank transfer (automatic)</td><td>494</td><td>22.44</td></tr><tr><td>Mailed check</td><td>471</td><td>21.42</td></tr><tr><td>Credit card (automatic)</td><td>467</td><td>21.24</td></tr></tbody></table>	payment_mode	Revenue (€K)	Percentage (%)	Electronic check	768	34.89	Bank transfer (automatic)	494	22.44	Mailed check	471	21.42	Credit card (automatic)	467	21.24																					
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9	Tech support provided to the customers' accounts for 90.11% of sales made	<p>Tech Support Service For Customers</p> <table><thead><tr><th>tech_support</th><th>Count</th><th>Percentage (%)</th></tr></thead><tbody><tr><td>Yes</td><td>2834</td><td>90.11</td></tr><tr><td>No</td><td>311</td><td>9.89</td></tr></tbody></table>	tech_support	Count	Percentage (%)	Yes	2834	90.11	No	311	9.89																											
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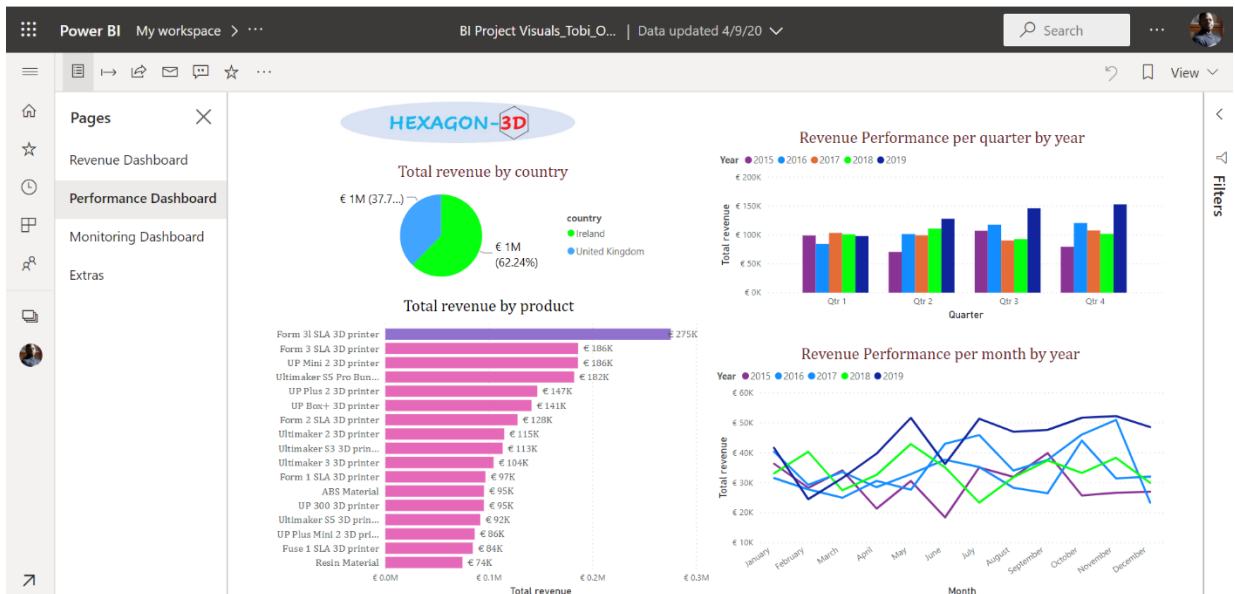
6.2 Reports

- **Revenue Report:** This report will go out to the top management and the finance team. It will provide insights on historical trend as well as help with proper planning and business strategy
- **Performance Report:** This is a high-level report which will go out to the top management at specific times (configurable) or upon request
- **Operations Report:** This report is applicable to the Sales team and Marketing team
- **Customer Service Report:** This report goes out to the customer service team and its Manager. It also captures the customer service performance

6.3 Dashboard (Desktop View)

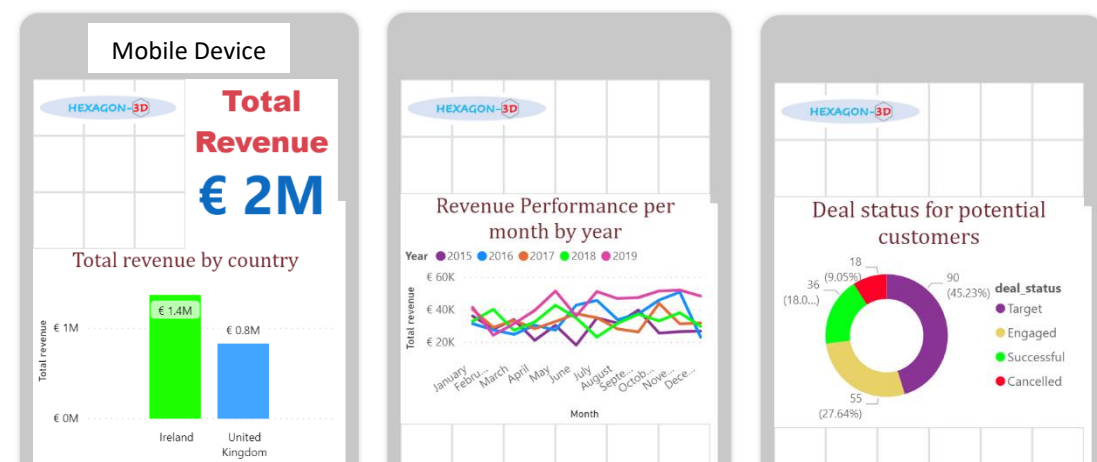
The dashboards were designed with keen focus on clarity, ease of use and quick understanding. Choice of colour, chart type and layout were all taken into consideration to achieve this, as per requirements. Dashboard can be viewed for customer service and sales on its corresponding application. Other business analytical requirements are carried out using power BI application. Below is a sample dashboard created using power BI.

Desktop View for the Dashboard



6.4 Dashboard (Mobile View)

The developed dashboard can also be accessed via a mobile device. By publishing the created dashboards, a user can view reports or dashboards by logging onto the shared portal. The mobile view for the developed dashboard is shown below.



7. DATA SOURCE

Using the sample data acquired from **mockaroo** (a random data generator application), the data was extracted, transformed using excel & then loaded into the database and power BI.



Highlighted below are the steps used to prepare the data.

7.1 Generate Random Data

The screenshot shows the Mockaroo web application interface. At the top, it says 'mockaroo random data generator'. Below this, there's a table with columns 'Field Name', 'Type', and 'Options'. The table contains fields like 'id', 'customer_id', 'first_name', 'last_name', 'email', 'gender', 'phone_number', 'purchased_date', 'purchased_time', 'employee_id', and 'company'. Each field has a dropdown for its type and options for formatting. At the bottom, there are controls for the number of rows (1000), format (CSV), line ending (Unix LF), and include options (header, BOM). There are also buttons for 'Download Data', 'Preview', and 'More'.

7.2 Evaluate Downloaded Data

	A	B	C	D	E	F	G	H	I	J
1	id	EID	Title	first_name	last_name	gender	email	DOB	phone_num	job_role
2		1 71-1093552	Ms	Franky	Ruppele	Male	fruppele0@samsung.com	09/18/1982	646-396-7103	Electrical Engineer
3		2 75-8718210	Honorable	Celestyna	Skoyles	Female	cskoyles1@icq.com	02/14/1979	827-369-8902	Sales Associate
4		3 47-6858957	Ms	Gran	Tilliard	Male	gtilliard2@china.com.cn	10/24/1975	871-299-4013	Geologist III
5		4 24-0797369	Rev	Cheryl	Cars	Female	ccars3@unc.edu	03/13/1980	746-160-7453	Cost Accountant
6		5 84-5803695	Ms	Lonny	Tooley	Male	ltooley4@columbia.edu	03/18/1988	690-577-5471	Recruiting Manager
7		6 65-0576389	Dr	Carlyle	Riggert	Male	criggert5@gov.uk	08/23/1984	327-360-9219	Systems Administrator I

7.3 Transform to Realistic Data

- The IDs were customised to reflect a uniqueness to its corresponding table
- Product names were obtained from sample 3D printers on the web

- Using Excel VLOOK-UP function, corresponding values for the looked-up values were obtained to fill up the table
- Duplicate records were removed
- Unique transaction records were created for each customer
- Quantity purchased, tech support was evenly distributed across the record

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
sn	transaction_id	customer_id	product_id	amount_paid	product_price	quantity	purchase_date	purchase_time	employee_id	company_name	color	payment_mode	phone_number	location_id
1	M_ID_000025127f	CID-93-7284336	PD_3D_014	€ 930	€ 230	4	2015-03-20	16:52	EE-016-028	Voomm	Purple	Electronic check	780-969-3995	LID-IE-353
2	M_ID_0000699140	CID-07-2453920	PD_3D_010	€ 810	€ 260	3	2017-08-26	10:58	EE-014-009	Eimbee	Orange	Mailed check	328-388-1686	LID-IE-353
3	M_ID_0000a6b0b2d	CID-18-3727062	PD_3D_009	€ 380	€ 120	3	2016-03-10	15:05	EE-016-028	Vinte	Maroon	Mailed check	615-501-8920	LID-IE-353
4	M_ID_0000eb2bf	CID-51-1528111	PD_3D_002	€ 1,435	€ 285	5	2016-06-15	11:24	EE-014-009	Vinte	Purple	Bank transfer (automatic)	437-267-6258	LID-IE-353
5	M_ID_0001c38687	CID-36-6038380	PD_3D_001	€ 585	€ 185	3	2017-08-30	15:08	EE-015-013	Roombo	Orange	Electronic check	113-186-0938	LID-UK-044
6	M_ID_0002237144	CID-75-9976499	PD_3D_013	€ 693	€ 221	3	2016-08-02	14:28	EE-017-030	Dabjam	Orange	Electronic check	739-163-5814	LID-IE-353
7	M_ID_0002812aa2	CID-02-6894897	PD_3D_006	€ 665	€ 127	5	2016-11-01	13:02	EE-017-034	Skynoodle	Yellow	Credit card (automatic)	670-170-0682	LID-UK-044
8	M_ID_0002a794ad	CID-77-0318400	PD_3D_001	€ 380	€ 185	2	2015-07-04	15:17	EE-018-047	Jabbercube	Green	Mailed check	151-894-9959	LID-IE-353
9	M_ID_0002e246b1	CID-32-0767598	PD_3D_003	€ 405	€ 375	1	2019-08-04	10:54	EE-016-028	Zooxo	Black	Electronic check	497-213-7312	LID-IE-353
10	M_ID_00037f6a5d	CID-47-5457257	PD_3D_006	€ 665	€ 127	5	2019-04-04	16:38	EE-018-043	Nlounge	Pink	Bank transfer (automatic)	338-663-8278	LID-UK-044

7.4 Balance Account (Prices and Dates)

In order to achieve ideal and proper visualizations for the business, much effort was made to ensure the mocked-up numbers and dates added up. Highlighted below is an account summary for the 5 years of operation of the company.

- Transaction table with QTY (9381) The total revenue was at £2,199,605
- Inventory table with QTY (9921) The total cost price was at £1,719,306
- Product table had a total of QTY (540) products left in-stock

A	B	C	D	E	F	G	H	I	J
Primary Keys				Amount Paid per Transaction					
Key	Table	ID Name	Format	Table					
PK	Employee	employee_id	EE-013-001	Calculation					
PK	Supplier	supplier_id	SP_001	Transaction					
PK	Inventory	shipping_number	SN-710-79-1581	(product_price x quantity) + sub_charge + techsupport_fee = amount_paid					
PK	Location	location_id	LID-IE-353	Prices for Ordered Products					
PK	College	customer_id	CID-24-4731971	Table					
PK	Customer	customer_id	CID-93-7284336	Calculation					
PK	Product	product_id	PD_3D_001	Inventory					
PK	Transaction	transaction_id	M_ID_000025127f	(cost_price x ordered_qty) = purchased_price					
PK	Leads	prospect_id	PP-001	Product					
				Arrival Date per Suppliers country of origin					
				Table					
				Supplier (Country)					
				Calculation					
				Inventory					
				Germany					
				ordered_date + 7 days = arrival_date					
				Inventory					
				USA					
				ordered_date + 14 days = arrival_date					

8. REFERENCES

Joseph Lucco, (2015). A Full Balanced Scorecard Example (Including 6 Templates). [Viewed on 7 April 2020]. Available from: <https://www.clearpointstrategy.com/full-exhaustive-balanced-scorecard-example/>

Vivek K., (2016). Enhancing Enterprise Intelligence - Leveraging ERP, CRM, SCM, PLM, BPM, and BI. CRC Press.

Microsoft, © 2020. Digital transformation is business transformation. [Viewed on 8 April 2020]. Available from: <https://docs.microsoft.com/en-us/learn/wwl/introduction-dynamics-365/2-digital-transformation-business-transformation>

Microsoft, © 2020. Get started with Dynamics 365 Customer Service. [Viewed on 9 April 2020]. Available from: <https://docs.microsoft.com/en-us/learn/modules/get-started-with-dynamics-365-for-customer-service/>

Microsoft, © 2020. Manage leads with Dynamics 365 Sales. [Viewed on 9 April 2020]. Available from: <https://docs.microsoft.com/en-us/learn/modules/manage-leads-dynamics-365-sales/>

Microsoft, © 2020. Get data with Power BI Desktop. [Viewed on 9 April 2020]. Available from: <https://docs.microsoft.com/en-us/learn/modules/get-data-power-bi/>