

2021-2022

**GUJARAT
INDUSTRY
VISIT
REPORT**

PREPARED BY

**SEMESTER ONE
STUDENTS**

**BY DATA SCIENCE AND
BUSINESS ANALYTICS**

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FYDSBA batch
HSNC University, Mumbai

DAY 1 – TEXTILE INDUSTRY

INDIAN TEXTILE SECTOR ANALYSIS

India's textiles sector is one of the oldest industries in the Indian economy, dating back to several centuries. This industry is extremely varied, with hand-spun and hand-woven textiles sectors at one end of the spectrum, while the capital-intensive sophisticated mill's sector is on the other end. The close linkage of the textiles industry to agriculture (for raw materials such as cotton) and the ancient culture and traditions of the country in terms of textiles makes it unique in comparison to other industries in the country. India's textiles industry can produce a wide variety of products suitable for different market segments, both within India and across the world.

Market Size

India's Textiles industry has around 4.5 crore employed workers. The industry contributed 7% to the industry output (by value) in 2018-19. The Indian textiles market is expected to be worth >US\$ 209 billion by 2029.

Government Initiatives

The Indian government has come up with several export promotion policies for the textiles sector. It has also allowed 100% FDI in the sector under the automatic route. The Rs. 10,683 crores (US\$ 1.44 billion) PLI scheme is expected to be a major booster for textile manufacturers. The scheme proposes to incentivise MMF (man-made fibre) Apparel, MMF Fabrics and 10 segments of Technical Textiles products.

Road Ahead

India is working on major initiatives, to boost its technical textile industry. Owing to the pandemic, the demand for technical textiles in the form of PPE suits and equipment is on rising. The government is supporting the sector through funding and machinery sponsoring. Top players in the sector are attaining sustainability in their products by manufacturing textiles that use natural recyclable materials. The future for the Indian textiles industry looks promising, buoyed by strong domestic consumption as well as export demand. With consumerism and disposable income on the rise, the retail sector has experienced rapid growth in the past decade with the entry of several international players into the Indian market. High economic growth has resulted in higher disposable income. This has led to rising in demand for products creating a huge domestic market.

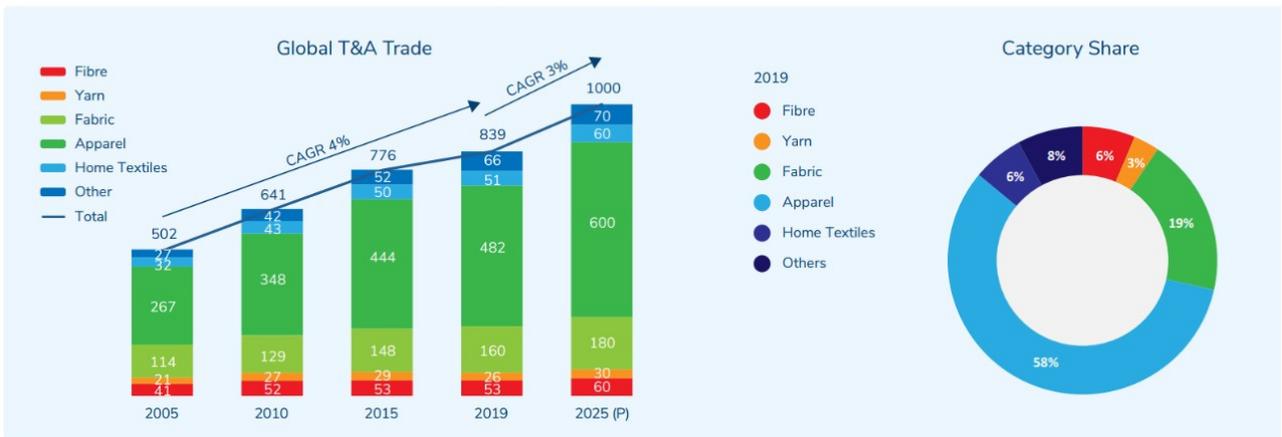
Fibre	 USA	 Australia	 China
Export Value (US\$ Bn)	6.67	3.30	3.12
Market Share	20%	10%	9%

Home Textiles	 China	 India	 Turkey
Export Value (US\$ Bn)	19.20	5.79	4.14
Market Share	37%	11%	8%

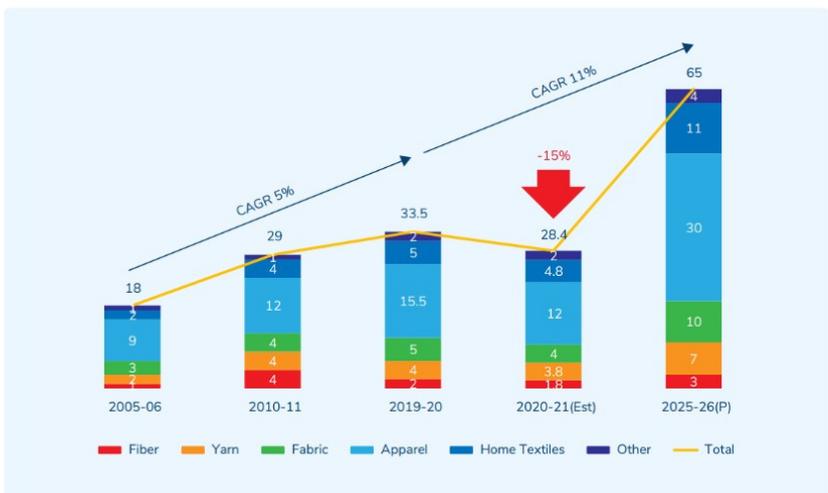
Yarn	 China	 India	 Vietnam
Export Value (US\$ Bn)	5.53	3.69	3.17
Market Share	21%	14%	12%

Apparel	 China	 Bangladesh	 Vietnam
Export Value (US\$ Bn)	149.90	40.90	33.70
Market Share	31%	8%	7%

Fabric	 China	 Italy	 S. Korea
Export Value (US\$ Bn)	72.70	7.57	7.26
Market Share	45%	5%	5%



Indian Textile and Apparel Exports (US\$ billion)



India's T&A exports reached US\$ 33.5 billion in 2019-20.

Due to the impact of Covid-19, India's T&A exports are expected to fall around 15% to reach US\$ 28.4 billion in 2020-21.

India's exports of T&A are expected to grow to US\$ 65 billion by 2025-26, growing at a CAGR of 11%.



About Sanimo

Sanimo Polymers Private Limited is one of the leading manufacturers and exporters of Polyester Dyed yarn in India. It was established in the year 2000 under the leadership and guidance of Mr. Suresh Shah (Founder & CMD). They have state of the art laboratories for R&D. Through this R&D, they offer customized products to our customers. We have in-house facilities of Twisting, Doubling, Dyeing, Multi-fold Plying and Computer Colour Matching.

Their company offers more than 15000 shades and our products are Oekotex certified. The yarns are made from environment-friendly chemicals (AZO free, APEO and NPEO free).

What did we learn at Sanimo?

- **What is yarn?**

Textile yarn is a strand of natural or synthetic fibres or filaments. Fibre is a small short piece of hair. A filament is a long strand of a single substance. In textile yarn, individual fibres or filaments are wound together to make threads.

Textile yarn can be made with natural fibres from substances such as wool from sheep, silk from silkworms, or cotton and linen from plants. It can also be made with synthetic, or man-made, fibres created from a variety of substances like nylon, acrylic, and polyester.

- **What is “yarn processing”?**

After a yarn has been manufactured and before it goes into fabrics of all kinds, there is various way to process it further. This process makes yarn resistant and strong too.

- **What is “yarn twisting” and what factors are involved in it?**

Yarn processing includes the technique of “Yarn Twisting”.

Twisting is a process that helps bind fibres or yarns together in a continuous strand, accomplished. The direction of the twist may be to the right, described as Z twist, or to the left, described as S twist.

FACTORS AFFECTING TWIST:

- The count of yarn to be spun.
- The quality of the cotton used.
- The use to which the yarn is put- is the yarn meant to be used as warp yarn or weft yarn, knitting yarn or any other yarn.
- The fineness of the fibre being spun.
- The softness of the fabric into which the yarn is to be converted.

When we asked about “wastage” we got to know that the industry average stands at 6% while Sanimo only has around 3% wastage after their yarn processing. It was revealed that the “wastage” is sold to carpet manufacturing companies to prepare carpets.

Why do they have so low wastage? Well, most of their “unfit products” are sold to carpet manufacturers and the embroidery industry.

Now, on further asking about the carpet industry (not their forte though) we got to know the following: -

MANUFACTURING PROCESS OF CARPET

WOOLLEN YARN SPINNING

- Spinning involves two steps Carding and Spinning- Carding is sometimes done by hand with help of carding brush or on carding rollers run by hand. The carded wool is spun into yarn by using a charkha or a spinning wheel. The thickness of the yarn depends on the quality of the carpet and generally a 3 ply yarn is used.

YARN DYEING

- The traditional pot dyeing method has been largely replaced by machine dyeing in closed Chambers. Dyes containing harmful substances such as AZO are banned and dye-stuffs from renowned international manufacturers are used. These dyes have a high degree of fastness. Depending on the weather, the dyed yarn has to be dried in the sunlight for one to three days. Pot dyeing and vegetable (natural) dyeing are still being used by some manufacturers.

YARN OPENING OR REELING

- Yarn opening is a process that involves opening the bigger and loose lea and wrapping it into tightly wrapped bunch which is smaller in size.

WASHING & DRYING

- It is done as the first wash to clean the carpet and for removal of dust and dirt or any stains on the carpet. In traditional setup drying is done under the sun, but many manufacturers have drying machine which can control the temperature and moisture of the carpet.

FINAL CLIPPING / FINISHING

- This is the finishing step in the manufacturing of carpet. The clipping is done with minute detailing.

Where does data science fit in the textile field?

The industrial visit at Sanimo Textiles has shown us the importance of coordination required between every team of the company. The textile industry, spread over a large area, has a lot of working staff, and data management is essential. From the starting import to the end customer export, each event has to be tracked, and as of our visit, we also found that the textile industry is facing severe issues with the ERP software. ERP Software helps businesses keep track of the events or works that are done, resources required, sales, marketing, finance, Human Resources, and many such features. At Sanimo, we learnt why ERP is used in Textile industries, how they manage their ERP software, and the issues they are looking forward to students of Data Science to solve and provide them with better solutions. Data science is deeply applied in the textile industry. As we observed, in the case of Sanimo textiles, the ERP software used is a standard one. Every industry has its requirement with ERP. Although, for example, the basic terminology, the data terminology and user usability and easy data management, a standard ERP is made chiefly for companies that sell their physical product directly into the market.

Furthermore, textile industries, especially companies that manufacture raw materials, use different terminology, scales and measurements, followed by processes. Here issue starts is the standard ERP software forces to work according to it, customisation possible in a standard ERP software are very few and are not making the work easy, and for this reason, when paperwork, bills, sales or marketing strategies are done. Moreover, since the data is printed to send it along with the export batch, the data first needs to be figured by the person working, which wastes more time and reduces employee efficiency. Moreover, making ERP software from scratch is not very easy and will not be recommended to any running company. So, students of data science can create some easy custom solutions for the company by using our coding and data management skills.

DAY 2 - PHARMACEUTICAL INDUSTRY

INDIAN PHARMACEUTICAL SECTOR ANALYSIS

India is the largest provider of generic drugs and enjoys an important position in the global pharmaceuticals sector. Globally, India ranks 3rd in terms of pharmaceutical production by volume and 14th by value. The domestic pharmaceutical industry includes a network of 3,000 drug companies and ~10,500 manufacturing units. The country also has a large pool of scientists and engineers with the potential to steer the industry ahead to greater heights.

Market Size

According to the Indian Economic Survey 2021, the domestic market is expected to grow 3x in the next decade.

- India's domestic pharmaceutical market is estimated at US\$ 42 billion in 2021 and likely to reach US\$ 65 billion by 2024 and further expand to reach ~US\$ 120-130 billion by 2030.
 - The Indian biotechnology industry was valued at US\$ 64 billion in 2019 and is expected to reach US\$ 150 billion by 2025.
 - India's medical devices market stood at US\$ 10.36 billion in FY20. The market is expected to increase at a CAGR of 37% from 2020 to 2025 to reach US\$ 50 billion.
 - As of August 2021, CARE Ratings expect India's pharmaceutical business to develop at an annual rate of ~11% over the next two years to reach more than US\$ 60 billion in value.
-

In the global pharmaceuticals sector, India is a significant and rising player. India is the world's largest supplier of generic medications, accounting for 20% of the worldwide supply by volume and supplying about 60% of the global vaccination demand. The Indian pharmaceutical sector is worth US\$ 42 billion and ranks 3rd in terms of volume and 13th in terms of value worldwide.

Exports

India is the 12th largest exporter of medical goods in the world. The country's pharmaceutical sector contributes 6.6% to the total merchandise exports.

Indian drugs are exported to more than 200 countries in the world, with the US being the key market. The foreign direct investment (FDI) inflows in the Indian drugs and pharmaceuticals sector reached US\$130 million between April 2021 and June 2021. In FY21, North America was the largest market for India's pharma exports with a 34% share and exports to the U.S., Canada and Mexico recorded a growth of 12.6%, 30% and 21.4%, respectively.

Government Initiatives

Under Union Budget 2021-22, the Ministry of Health and Family Welfare has been allocated Rs. 73,932 crore (US\$ 10.35 billion) and the Department of Health Research has been allocated Rs. 2,663 crore (US\$ 365.68 billion). The government allocated Rs. 37,130 crore (US\$ 5.10 billion) to the 'National Health Mission'. PM Aatmanirbhar Swasth Bharat Yojana was allocated Rs. 64,180 crore (US\$ 8.80 billion) over six years. The Ministry of AYUSH was allocated Rs. 2,970 crore (US\$ 407.84 million), up from Rs. 2,122 crore (US\$ 291.39 million).

Road Ahead

Medicine spending in India is projected to grow 9-12% over the next five years, leading India to become one of the top 10 countries in terms of medical spending. Going forward, better growth in domestic sales would also depend on the ability of companies to align their product portfolio towards chronic therapies for diseases such as cardiovascular, anti-diabetes, anti-depressants and anti-cancers, which are on the rise.

India Exports by Country	Last	Previous		
United States	483.20	513.70	INR Billion	Jan/22
United Arab Emirates	171.83	195.67	INR Billion	Jan/22
China	95.41	115.08	INR Billion	Jan/22
Netherlands	86.27	90.43	INR Billion	Jan/22
Germany	66.71	69.34	INR Billion	Jan/22
Sri Lanka	62.04	47.31	INR Billion	Jan/22
Singapore	61.19	65.83	INR Billion	Jan/22
Nepal	59.49	73.99	INR Billion	Jan/22
Hong Kong	58.12	67.70	INR Billion	Jan/22
Belgium	57.35	54.60	INR Billion	Jan/22
Australia	51.36	75.38	INR Billion	Jan/22
Italy	47.95	49.18	INR Billion	Jan/22
Indonesia	47.51	61.86	INR Billion	Jan/22
Brazil	45.88	40.95	INR Billion	Jan/22
Thailand	41.87	42.26	INR Billion	Jan/22





Bharat Parenterals Limited

About Bharat Parenterals Limited

Bharat Parenterals Ltd. is a Gujarat based pharmaceutical company, established in 1992 by Mr. Ramesh Desai, who started the company with a vision of making world-class affordable medicines and taking it to the forefront of contract manufacturing units in Gujarat. From the time of its inception in 1992, Bharat Parenterals Ltd. has been completely focused and dedicated to manufacturing an extensive spectrum of pharmaceutical formulation products.

It engages inefficient research, development, manufacturing, marketing, sourcing and distribution of high-quality and top-quality pharmaceutical products. Their clients range from small biopharmaceuticals start-ups to some of the world's largest pharmaceutical companies.

MISSION

- To become a significant global player by providing high quality, affordable and innovative solutions in medicine and treatment.
- Aspires to acquire major share in the Contract Research and Manufacturing Services (CRAMS).
- To cater best medicines in international and domestic market.
- To build mutual beneficial relationship with customers by providing world class facility and high standard medicines.
- To set up an environmental responsible organization.

VISION

Bringing access to affordable and quality medicines to the whole wide world and lead the way for medical innovation.

What did we learn at BPL?

- What are capsules?

A small soluble container, usually made of gelatin, encloses a dose of oral medicine or a vitamin.

- What are vials?

A vial is a small glass or plastic vessel or bottle, often used to store medication as liquids, powders or capsules.

- How many kinds of capsules are manufactured in BPL?

They manufacture many kinds of capsules like RAMOXICILLIN, CLOXACILLIN, CEFIXIME and many more all these medications are antibiotic, antiviral, anticancer etc.

List of some capsules manufactured at BPL: -

- Ramoxicillin, cloxacillin for B-LACTUM ANTIBIOTICS
 - Cefixime for CEPHALOSPORINS ANTIBIOTICS
 - Azithromycin for ANTIBIOTICS
 - Rifampicin for ANTI-TUBERCULOSIS
 - Rabeprazole for ALIMENTARY SYSTEM
 - Ketoprofen, tramadol for ANTI PYRETIC/ANALGESIC
 - Ibandronic acid for SUPPLEMENTS
 - Citicoline, gabapentin, pregabalin for CNS
 - Danazole for HORMONES
 - Etoposide for ANTICANCER
-



About Gujarat Liqui Pharmacaps Pvt. Ltd.

GUJARAT LIQUI PHARMACAPS (PVT) LIMITED (GLPL) is a leading state-of-the-art Indian Pharmaceutical Manufacturing facility specializing in Novel Drug Delivery Systems in Soft Gelatin Capsules. They manufacture, market and distribute these Formulations around the world. In addition, they have their foray into other dosage forms as well. Their special focus on Research, Development of new formulations and validating their Methods of Analysis have made them so unique in Soft-Gels in such a short time in the rapidly changing scenario of the pharmaceutical world.

MISSION

- **Business Excellence:** Through delighted customers with long term win-win-win relationships and technological innovations.
- **Nurturing Human Assets:** By providing an open and challenging working environment charged with passion and aided by emotional intelligence.
- **Responsible Corporate Citizenship:** Through conservation of energy and providing support to Mother Nature.

VISION

- Be global and remain local.
- Build a motivated institution of competent persons and expand our knowledge base.
- Strive relentlessly for excellence in every sphere of our activities through continual up-gradation of knowledge.
- Nurture environment, conserve energy and support human lives with our serious health care efforts

What did we learn at GLPL?

- What is Soft Gelatin?

A soft-gel or soft gelatin capsule is a solid capsule (outer shell) surrounding a liquid or semi-solid centre (inner fill). An active ingredient can be incorporated into the outer shell, the inner fill, or both. They are oral dosage forms for medicine similar to capsules.

Soft-gel shells are a combination of gelatine, water, opacifier and a plasticizer such as glycerine and/or sorbitol(s).

- Advantages of Soft Gelatin
- Easy to swallow, no taste, unit dose delivery, tamper-proof.
- Wide variety of colours, shapes, and sizes.
- Accommodates a wide variety of compounds filled as semi-solid, liquid, gel or paste.
- Immediate or delayed drug delivery.
- Can be used to improve bioavailability by delivering drugs in solution or other absorption enhancing media.
- Requires special manufacturing equipment.
- Stability concerns with highly water-soluble compounds, and compounds susceptible to hydrolysis.
- Limited choices of excipients/carriers compatible with the gelatine.

Now, over to the packaging part.

- Types of Pharmaceutical Packaging:
 - Containers
 - Aluminium foil
 - Injectibles/ Vials
 - Bottles
 - Cartons
 - Paper Board
 - Lamitubes
 - Paper
 - PVC Based Combinations
-

Packaging in the pharmaceutical industry varies from drug to drug but normally there are three levels of packaging commonly referred to as primary, secondary, and tertiary packaging.

PRIMARY PACKAGING SYSTEM	SECONDARY PACKAGING SYSTEM	TERTIARY PACKAGING SYSTEM
<ul style="list-style-type: none">• Primary packaging system is the material that first envelops the product and holds it i.e., those package components and subcomponents that actually come in contact with the product, or those that may have a direct effect on the product shelf-life.• E.g. - ampoules and vials, prefilled syringes, IV containers, blister packs, etc.	<ul style="list-style-type: none">• Secondary packaging system is outside the primary packaging and used to group primary packages together.• E.g. - cartons, boxes, shipping containers, injection trays, etc.	<ul style="list-style-type: none">• Tertiary packaging system is used for bulk handling and shipping.• E.g. - barrel, container, edge protectors, etc.

Some commonly used types of primary pharmaceutical packaging are Ampoules, Vials, Blister packs, Bottles, and Sachet packaging. Let's check out each of them in detail.

Ampoules Packaging: The ampoule packs are mainly taken in use for the packaging of a small number of liquid drugs. These containers are small in size compared to the vials packaging and are mostly used to store single-dose medicines and are made up of glass or plastic materials.

Vials Packaging: Vial containers are also made of glass and plastic materials but are comparatively larger in size than ampoules containers. These containers are also used to store liquid, solid, or powder drugs but their capacity to store drugs is more compared to the ampoules containers.

Blister packs: Blister packs are commonly used for the packaging of solid doses like tablets and capsules. The packs are mainly made up of thermoformed plastics and manufactured with the lidding of aluminium foil or plastic that could be torn using hand. A state-of-the-art blister pack usually comprises a basic coat of aluminium or robust paper or plastic and a transparent plastic film through which the individual tablets can then be squeezed one by one.

Bottles: Pharmaceutical packaging bottles are usually available in two types of glass and plastic bottles. They are mostly available in orange and light brown colour as these colours protect liquid drugs from ultraviolet lights.

Sachet Packaging: Sachet packages are small pouches available in different shapes and sizes e.g: square and rectangle shapes. These pouches are mainly made up of a particular type of plastic, give a paper-pouch kind of look to the pouch and could be easily torn by hand. These pouches are affordable and can only be used once, as once torn couldn't be reused.

- Role of packaging
 - A good packaging always gives assurance of patient safety.
 - Uniformity of the products in different batches and in different production lots.
 - Packaging provides safety of products from heat and cold because pharmaceutical products are sensitive in nature.
 - Pharmaceutical packaging protects the product from physical, chemical and microbial invasion.
 - It must maintain the physical quality of all dosages and protect against all damage and breakage.
 - Packaging maintains the characteristics properties of pharmaceutical products.
 - An ideal packaging should be able to hold the product without loss on account of leakage, spoilage or permeation.
 - An ideal packaging should not absorb or absorb any material containing.
 - The closure should be compatible with pharmaceutical products.
 - The closure should provide airtight closing to the container. so that it prevents the product from microbial growth.
 - An ideal packaging should be able to reduce the risk of toxicity
-

- Benefits of packaging
 - Packaging provides prevention from microbial growth.
 - A good packaging always maintains the sterility of the product.
 - Packaging provides control of degradation of the drug or product by oxygen, moisture and heat.
 - The quality of the packaging is directly related to the quality of the product. so that the company takes higher-quality packaging and the quality of the packaging is outstanding as it maintains the quality of products.
 - protect against any damage caused by external influences that can alter the property of the pharmaceutical product.
 - Due to proper packaging, the product maintains their therapeutic effectiveness from the time of packaging till they are consumed
 - The packaging material is chosen with care and checked for compatibility with active products.
 - It gives protection against moulds and bacteria.
 - Due to that, customers get good quality products without compromising on the content and quality.
 - It protects the pharmaceutical product from light, air and moisture. so, that zero change in the chemical properties of drugs or medicines.
-

Where does data science fit in the pharmaceutical field?

At Gujarat liqui Pharmaceuticals limited, we found that the company does more groundwork and focuses on customer behaviour and sales of products in the offline modes. The company studies products in the market, products sales, and customer feedback. This study can belong as one day or else as long as 12 years also, such as data management, sorting, analysis, cleaning and disposal of data. Furthermore, data scientists are trained experts in this part m where a data scientist can reduce the amount of time consumed to work with data. Moreover, we are also trained to make business analyses, so after the study, the work is made more accessible by giving out the final implementation solution to the company. So, data scientists can reduce the costs, staff required and time consumption.

Bharat parenteral Limited is a complete functional pharmaceutical, so this industry has more work with data. All final batches and products are represented with data from the start to the end. To Keep track of each batch, they require enormous staff power to coordinate the physical data and the soft copies. So, if any rejection of any product happens, it becomes a headache to track back. Furthermore, data science comes into implementation, and data scientists can provide automation to the companies like BPL. Where any rejection happens, the machines will retrieve the data themselves, thus reducing the human work.

CONCLUSION

Overall, SAP is the software used in most industries like textile, pharmaceutical and many. SAP is overall one powerful business solution, but this business solution cannot be tuned to your needs to a considerable extent. Nevertheless, it can solve your issues. However, if the company or its employee fails to manage the sap, the SAP can also double up the work. As seen in Sanimo textiles, the SAP is very professional, and ordinary workers cannot use SAP, whereas the same SAP is causing data retrieval problems in pharmaceutical industries.

So, what is SAP?

Let us have an overview of sap in deep.

SAP is systems, applications and products. This is a powerful tool that helps you to manage your company. From making the lead to its received and final delivery of the product, SAP is very efficient. Nevertheless, it has high disadvantages also. Companies and prominent industries in India, in different fields, try to save costs and time by cutting shorting their hiring process. They hire workers who are talented and hard-working. So here the problem comes in is the SAL being, a professional software it becomes difficult for most Indian industries to handle because the terminology is to be taught to the employees. Here the effect of the communication with the software reduces, if the software is accessible easily the efficiency rate of the employee stays high, due to this problem, sap software is having a high sale with companies which have too much IT equipment. For the textile industry m, the IT equipment does not matter because they still can run on traditional methods. So students of data science having most of the skills can make connected automation better than SAP for specific industries, providing the specific solution, this solution becomes very accessible to the particular type of industries. Data plays a huge role in all industries, and SAP is a standard solution, not a custom one. Though you can make some custom, it can cost you high, and most companies do not prefer to add on cost to their budget. So they manage to use what they have. The data scientist of this new era highly talented, and we have learnt about the problem. Data scientists will solve this problem as soon as possible and disturb this SAP dominant industry by making the solutions from India and selling them worldwide, make in India and made in India.

TESTIMONIALS OF STUDENTS

"It was not just domain knowledge I got but, I also insights on the functioning of a factory as a whole and got to know what a managerial role of the company looks like."

-Hardik Shetty

"I have learnt to apply the knowledge to uncover solutions hidden in the data to take on business challenges and goals."

-Soham Chowkekar

"My interest has always been in the application that can make users make a better decision about the working of an organisation. On the industrial visit, I also got to know about better utilisation of resources we have."

-Juhi Jadhav

"Industrial Visit has been a great opportunity, helping to improve business and data Analytics study in different domains."

-Kalp Jain

"The Industrial visit was too great, learnt many things, experienced new opportunities in data science and business analytics and our communication skill also improved."

-Jayant Jadhav

"The industrial visit to Gujarat enlightened us in various ways. We got to know the insight of various domains and how the applications of data science are being utilized and ways we can explore more of it. The industrial visit also had the domains explained by the professionals of the respective fields which was also a great experience."

-Aditya Singh

"It was an opportunity to practically learn through interaction and working methods."

-Niddhi Parmar

"First of all, I learned how goods are produced in the textile and pharma industry in detail. I learned how the Quality Control department and different kinds of software are used while working across all layers of production. I learned about the kind of data that is collected and how this is used to improve production."

-Abdeali Bootwala

**THANK
YOU**

