ECAD Library Database – Altium Designer

Scope : Database Library ("**.DbLib**")

Application : Components Library Management

ECAD stands for electronic computer-aided design. Libraries are containers to store components in. Components may consist of schematic symbols, PCB footprints (shapes), simulation models and a lot of other parameters, like MPN (Manufacturer Part Number), manufacturer, value, etc.

Components Library Management is to ensure every team has access to the correct component information on-demand. This helps designers to stay productive and focus on designing great new products, Components engineers to handle the up-to date list with revision history of components and Procurement team to maintain the sourcing of components based on the stock availability.

Client's situation before the project commencement

The client used multiple library files with different standards to cater to the diverse design needs with multiple design teams. They kept several spreadsheets to document details about each part and its parameters. At the beginning, there weren't any issues among different teams, such as components engineering and procurement.

Over time, managing the library became challenging as the number of files and spreadsheets increased. It became a hectic task to collaborate with multiple teams. All of the teams faced struggles in handling these files efficiently.
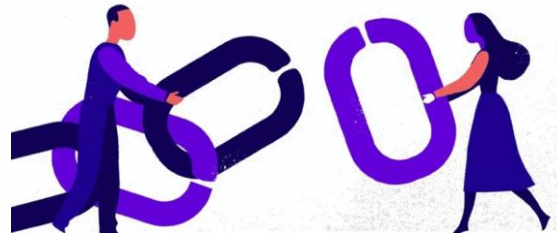
Pros:
- Versatility
- Adaptability
- Customization
- Detailed Information

Cons:
- Risk of Inconsistency
- Complexity Over Time
- Coordination Challenges
- Increased Overhead
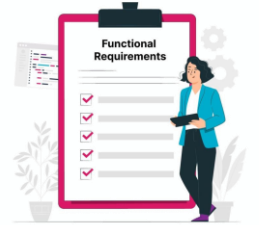
Database Library - SoW

Challenges

- Multiple standalone library files

- Multiple spreadsheet for the component details

- Own variant of Library Design Standards

- BOM Management

- Part duplication

- Unapproved or Obsolete parts

- Collaboration among different teams

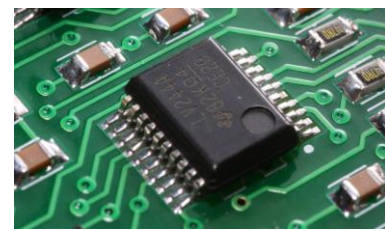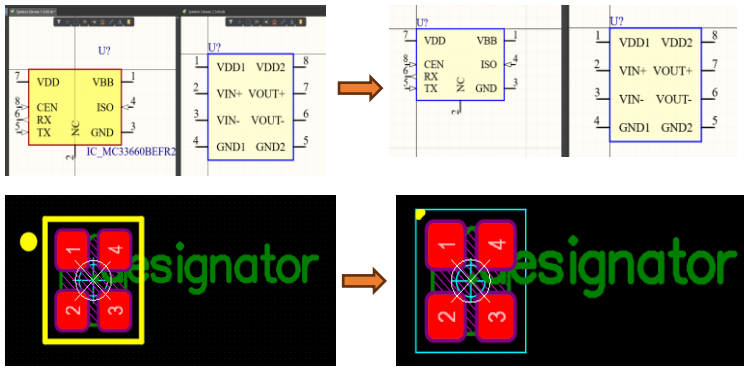- Manage vendor part data and relationships

Requirements

- Centralized Database Library

- Simultaneous access to Different Design teams

- Relationship between different teams

- Access to Design centres at multiple locations
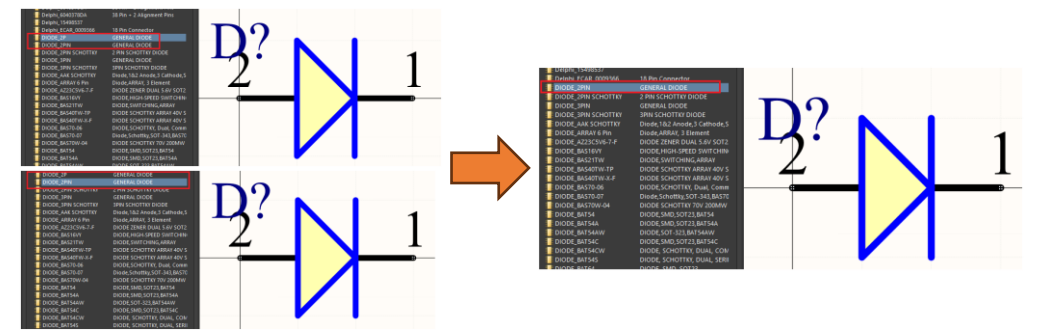
- Ensure Consistency

- Library standards verification

- Deletion of duplicate Parts

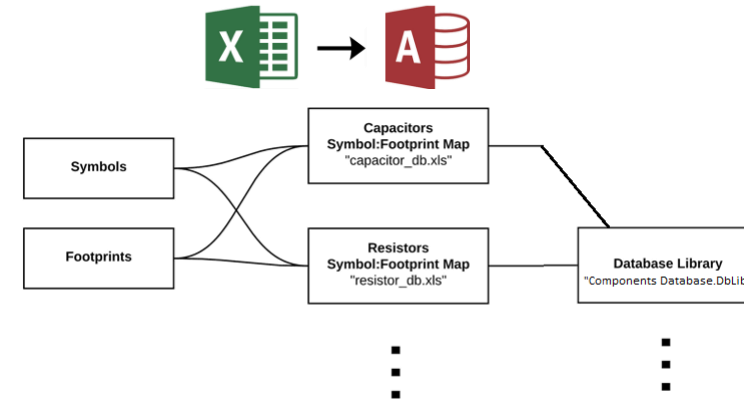- Deletion of unapproved or obsolete parts

- Combine multiple libraries into organized library
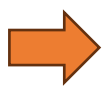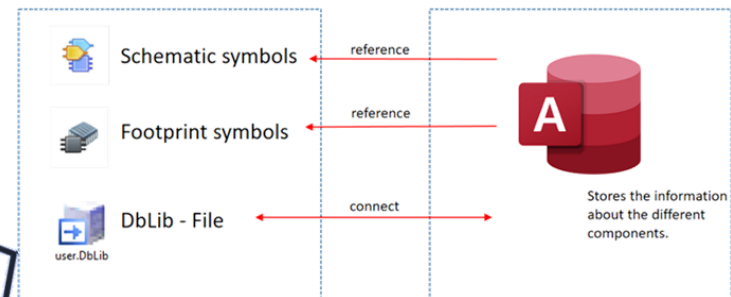
How we executed? (Cont.)

- Split the components into types (capacitor, resistor, IC, etc.)

- Added common and specific parameters for every type

- Introduced Plm Part Numbers for ease identification of components

- Component details in the spreadsheet are converted to Access Tables

- Creation of Access database and Database Library (Altium)

Database Library Connection in Altium

- Created connection between Access.mdb and Alitum

- Link and Foreign keys for the connection

- Updated Field mappings

- Required components are fetched through the components panel as per the design needs

Database Library maintained at centralized location (preferable – Cloud Server) for all the team for the ease of usage/application.

- Sandbox in the cloud (PTC Integrity – Cost effective cloud server)

- Push the Library and Access files and Database Library files into PTC

- Update the Library files as per usage by the respective teams.

- Synchronize every time before the application (to make it up-to date files)
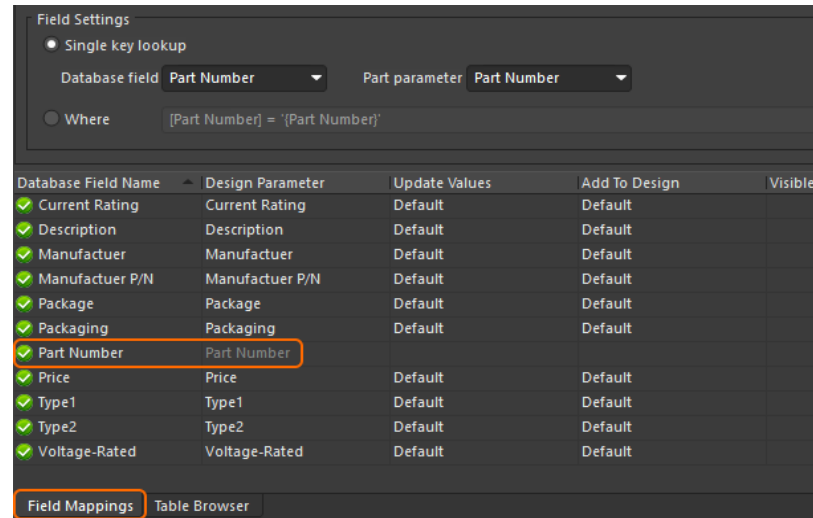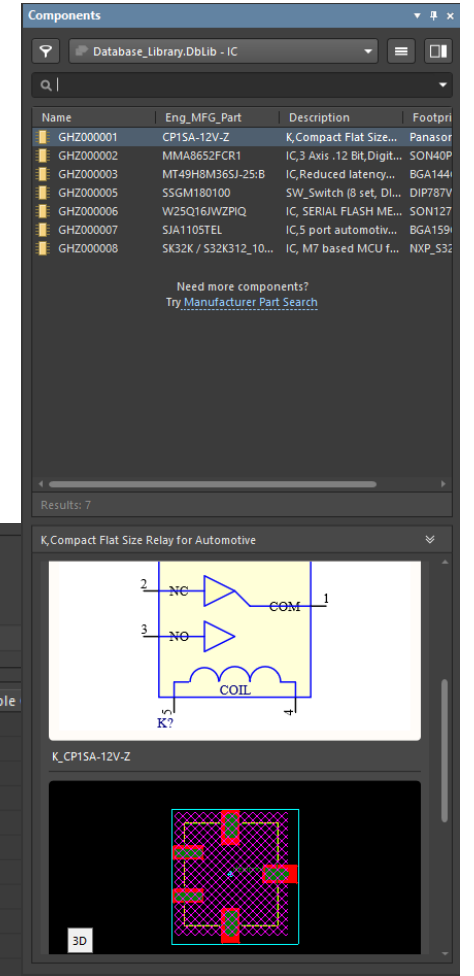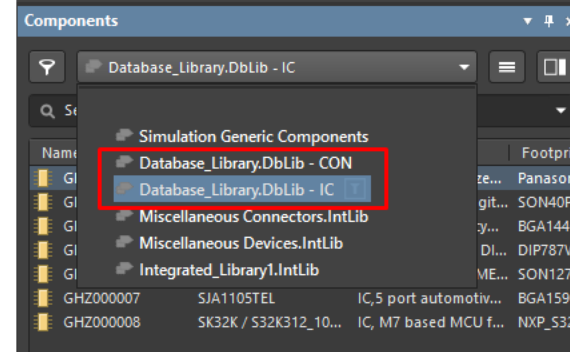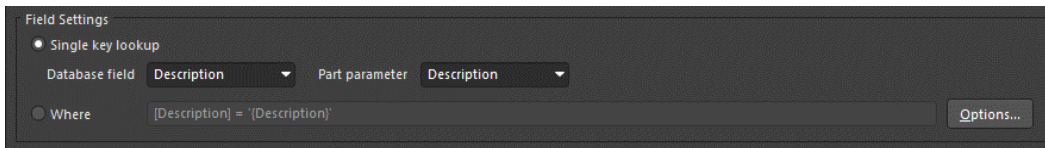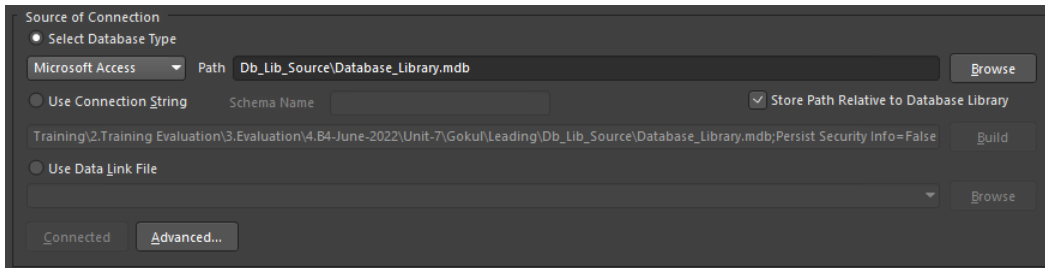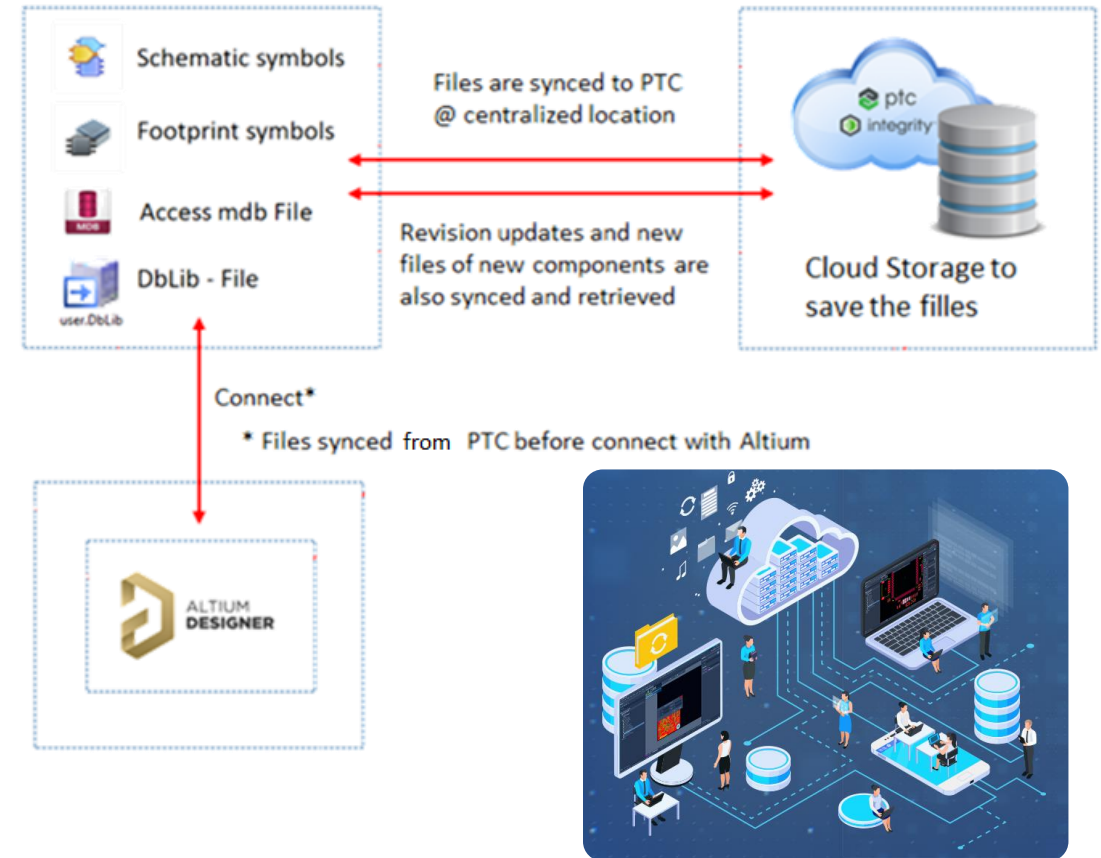
How we executed?

Component Library Management – (Cloud Setup – PTC Integrity)

PTC Integrity Sandbox Setup – With Projects
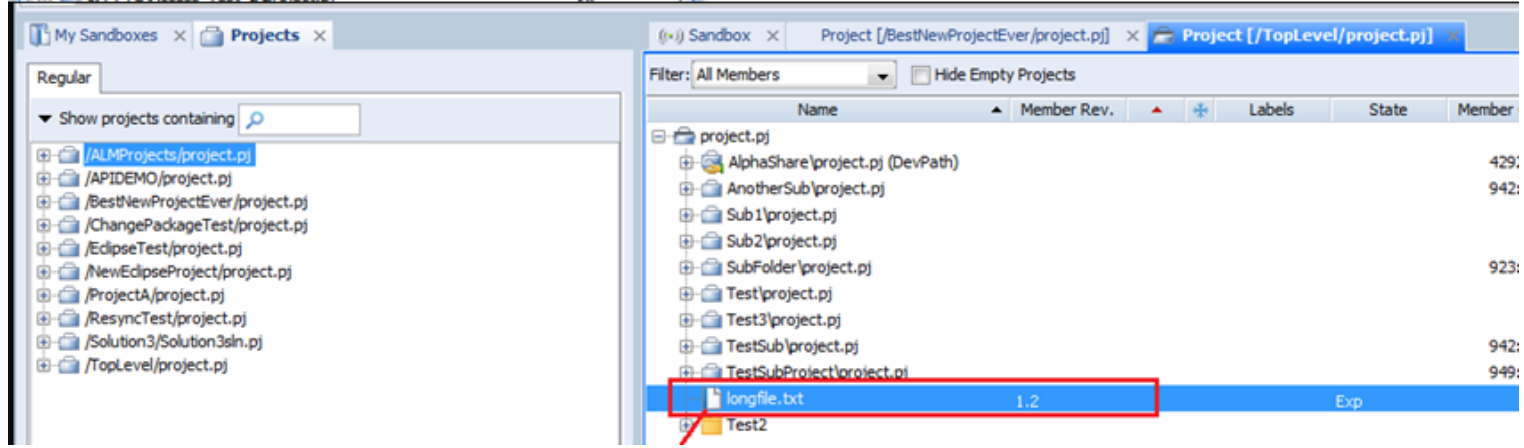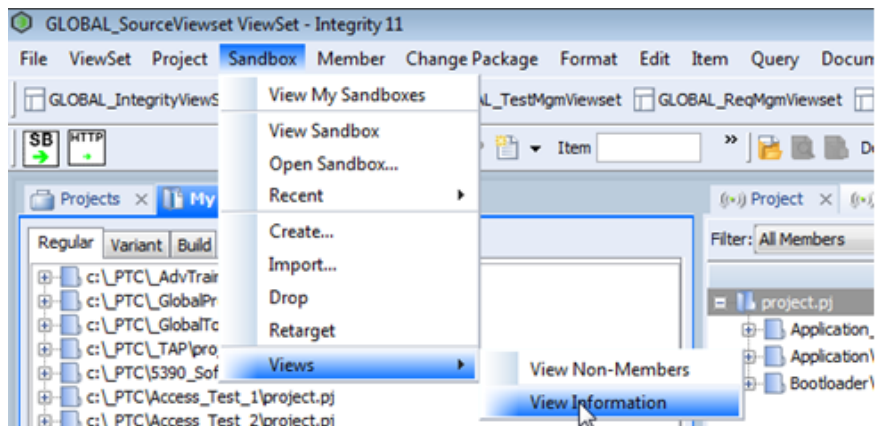
Revision History
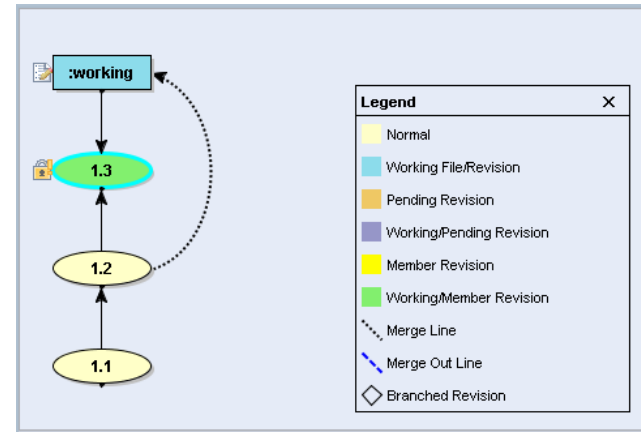
Altium – DbLib & Components Panel
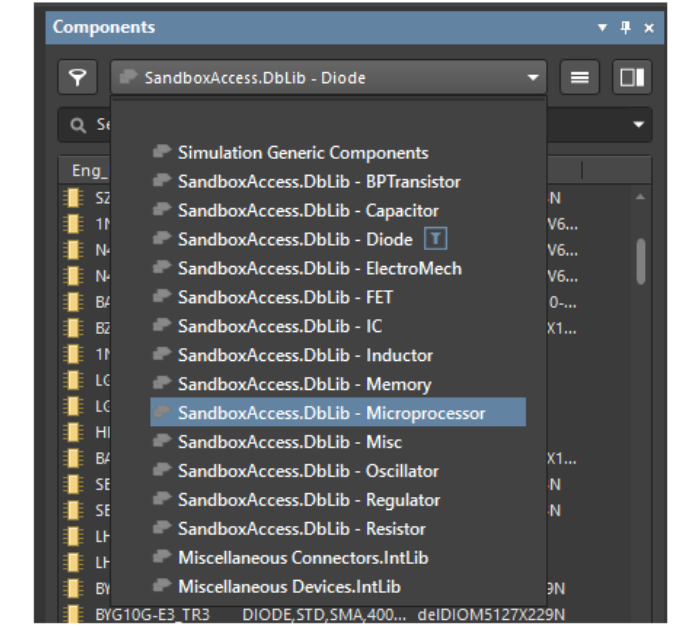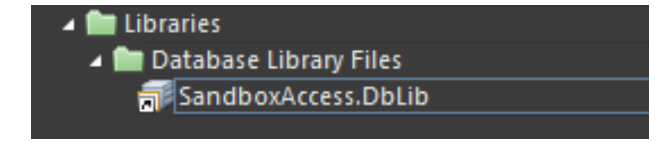
Components Database among different Teams

The usage components database between different teams

Components Database

| Schematic Symbols | | PCB Footprints |
| Access Database | | Database Library |

Procurement Team

- Stock management
- Components Sourcing
- Vendor relationships

Components Engineering Team

- Alternate suggestion
- Library files & Parameter update
- Track of PCN, EOL & others

Design Team

- Existing check
- Library creation
- Maintain consistency
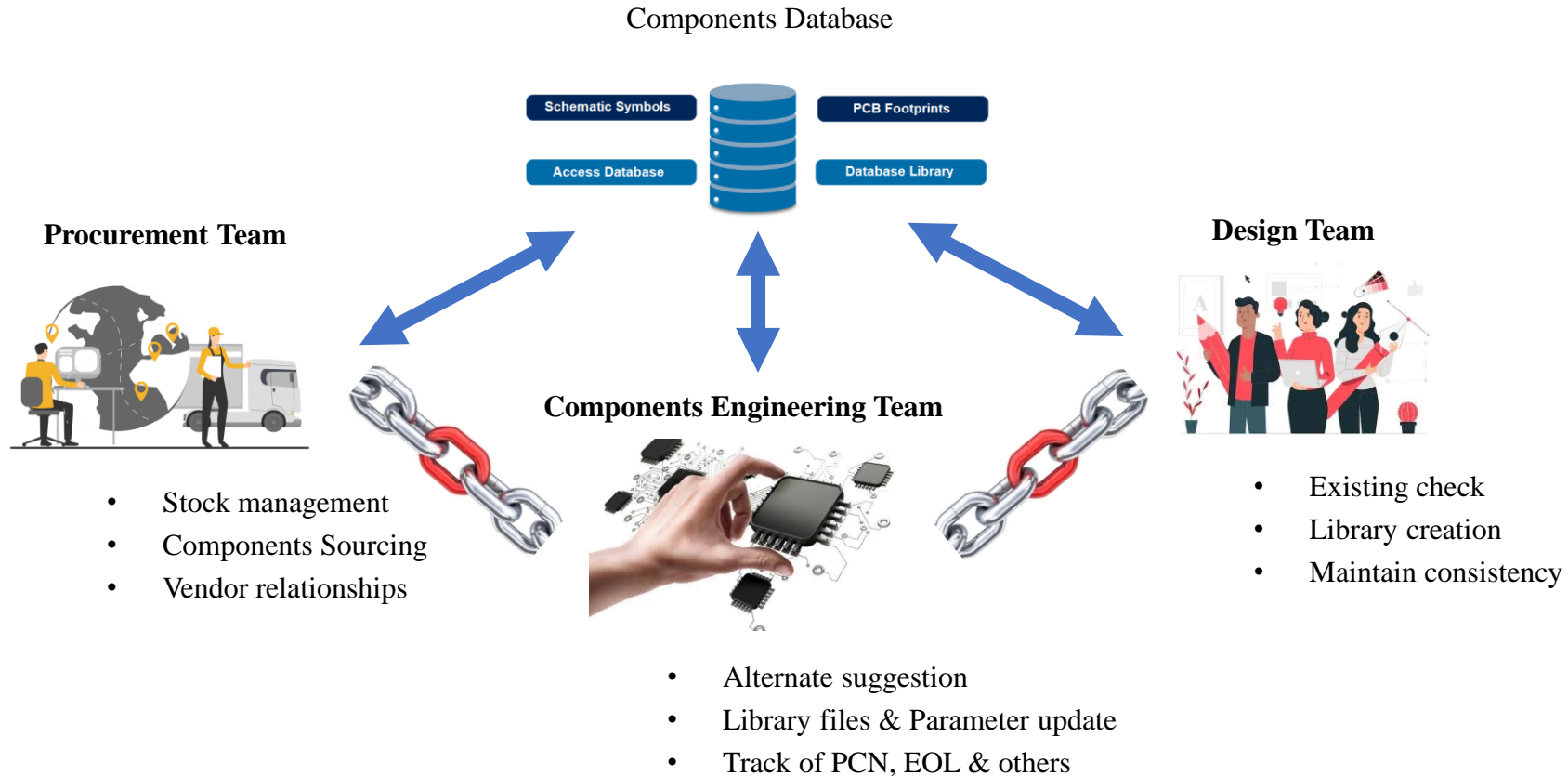
Few steps that are advised to each team member to make "Components Library Management" as a smoother and more streamlined process.

Procurement Team Process

Everyone in different Team use the files from cloud as the primary source for files. In case any updates are made locally (from files downloaded from the server), the corresponding updated files will be synchronized with the cloud server to ensure the most current data. This enables easy access for other teams as well.

Procurement Team

- Check component availability based on the Bill of Materials (BOM) information.

- If a component is unavailable, generate a new PLM Part Number based on the component category.

- Periodically update stock information for all parts in the database.

- Source the components as needed.

- Manage vendor part data and relationships.

Bill of Material (BOM)

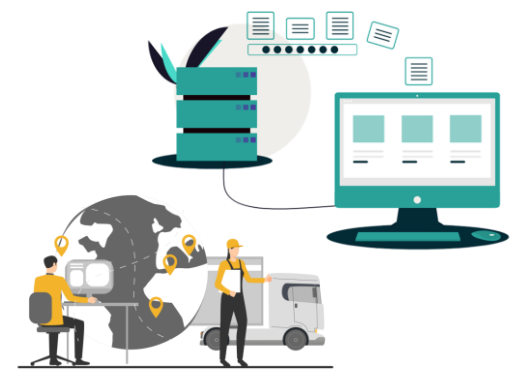| #	Mfg Part No	Mfg Name	Description	Case/Packaging	Count/BOARD, pcs.
1	CR2032 PANASONIC	Panasonic Battery	3V 20 X 3.2 MM 200mA		1
2	C3225C0G1H473J	TDK CORPORATION	CAP CER 47000PF(0.047uf) 50V C0G 5% 1210	1210	1
3	C0805C104K4RACTU	Kemet	CAP .10UF 16V CERAMIC X7R 0805	805	32
4	ERJ-6GEYJ102V	Panasonic - ECG	RES 1.0K OHM 1/8W 5% 0805 SMD	SMD SMT 0805	8
5	9C08052A1002JLHFT	Yageo Corporation	RES 10K OHM 1/8W 5% 0805 SMD	SMD SMT 0805	37
6	9C08052A4701JLHFT	Yageo Corporation	RES 4.7K OHM 1/8W 5% 0805 SMD	SMD SMT 0805	16
7	ERJ-8ENF2490V	Panasonic - ECG	RES 249 OHM 1/4W 1% 1206 SMD	1206	12
8	CRCW08051K20JNTA	vishay/ dale	1/8WATT 1.2KOHMS 5%	SMD SMT 0805	1
9	RC0805JR-075K6L	Yageo Corporation	RES 5.6K OHM 1/8W 5% 0805 SMD	SMD SMT 0805	1
10	ERJ-6GEYJ302V	Panasonic - ECG	RES 3.0K OHM 1/8W 5% 0805 SMD	SMD SMT 0805	1
11	MCR10EZHF1472	Rohm	RES 14.7K OHM 1/8W 1% 0805 SMD	SMD SMT 0805	1
12	RC0805FR-0720KL	yageo corporation	RES 20.0K OHM 1/8W 1% 0805 SMD	SMD SMT 0805	1
13	9C08052A3003JLHFT	yageo corporation	RES 300K OHM 1/8W 5% 0805 SMD	SMD SMT 0805	1

Bill of Material

Product Name: (CAN)
Product Code: 950952-006
Revision: 6
BOM id: 85
BOM Create Date: 7/2/2012 12:35
Date: 7/6/2012 14:55

Vendor:
Currency:
Annual Quantity:
Lead Time:
Component Cost:
Test Cost:
Handling Cost:
Total Cost:

Item	Qty	Part Type	Part Number	Designator	Footprint	Description	Supplier #1	Ordercode
1	1	LM1117-3.3	000776	A1	SOT223	Voltage regulator linear LDO 800mA	National	LM117MP
2	1	78L05	000305	A2	SO8	Voltage Regulator Linear Positive	National	LM78L05/
3	2	22pF	000339	C1, C2	603	Capacitor ceramic NPO 50V zmd	Kemet	C0603C22
4	10	100nF	000294	C3, C6, C8, C9, C10, C11, C12, C13, C14, C15, I5A, II5, IIC, I2, I3, I4, I5A, II5B	603	Capacitor ceramic X7R 50V zmd	Various	Various
5	1	10uF	000305	C4	1210	Capacitor ceramic X5R 35V zmd	Murata	C1210C10X
6	2	10uF	000263	C5, C7	805	Capacitor ceramic X5R 16V zmd	Various	Various
7	4	BAT54J	000411	D1, D2, D3, D4	SOD323F	Diode schottky	NXP	BAT54J
8	1	12.000MHz	000340	K1	JO32	Crystal smt, 4pins	Geyer Electronic	Various
9	1	PUR006L6	000349	M004	NONE	Bare PCB	Various	PUR006L6
10	4	B 2B-EH-A	000225	P100, P101, P103, P104	B 2B-EH-A	Shrouded header, 2p, p=2.5mm, Top Entry, TH	JST	B2B-EH-A
11	1	10k	000259	R1, R3, R4	603	Resistor SMD 5%	Various	Various
12	1	180E-0.05%	000344	R10	603	Resistor SMD 0.05%	Viking Tech Corporation	AR05ATC
13	1	105E-0.05%	000345	R10	603	Resistor SMD 0.05%	Viking Tech Corporation	AR05ATC
14	1	5k62-0.05%	000343	R05	603	Resistor SMD 0.05%	Viking Tech Corporation	AR05ATC
15	1	1M	000257	R06	603	Resistor SMD 5%	Various	Various
16	5	120E	000347	R2, R5, R6, R7, R8, R9, R85, R12, R14	603	Resistor SMD 5%	YAGEO	RC0603J
17	1	LPC11C24	000340	U1	LQFP48	Microcontroller Cortex-M0	NXP	LPC11C24
18	1	HEX-I6+	000306	USV	NONE	Software	Tokheim	hex file
19	3	HAL503	000624	U2, U3, U4	SOT89-HAL5XX	Hall Sensor - Medium sensitivity - Latching	Micronad	HAL503M
20	1	AD7795	000177	U6	TSSOP24	AD Converter 16bit Sigma Delta	Analog Devices	AD7795B

Components Engineering Team Process
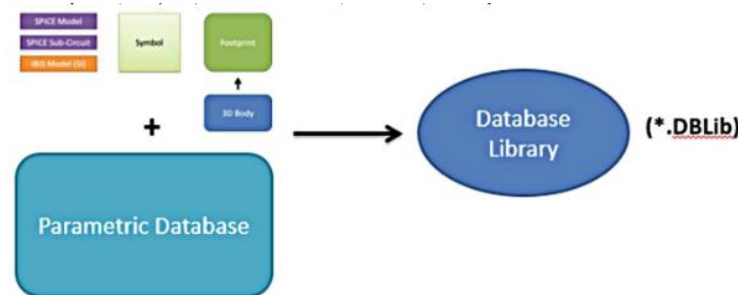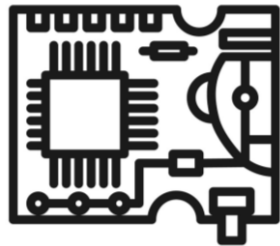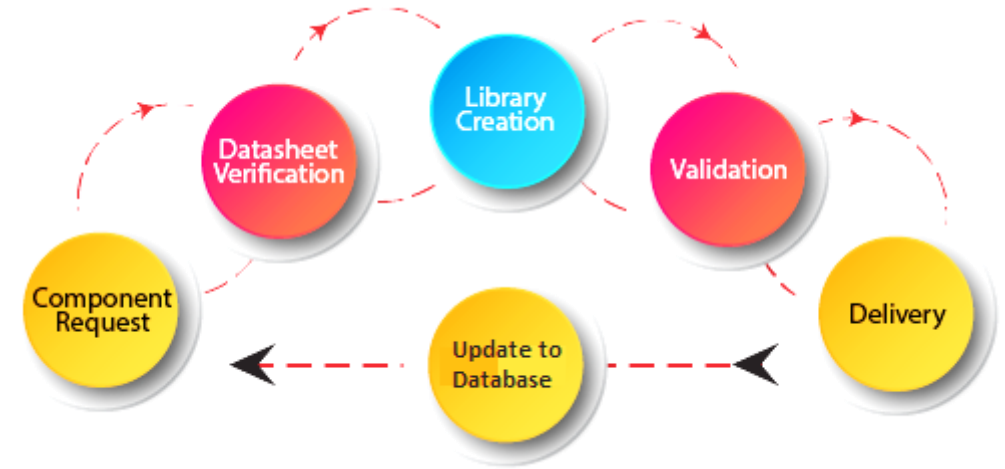
Components Engineering Team

- Review the new PLM Part Numbers created by the procurement team

- Suggest alternate component details for the newly created Plm Part Number components.

- Add essential parameter details of the component in the database.

- Rise a request to the design team to create the Library, for the mapping of symbol, footprint and other files to the respective component.

- Update the Library files (for the request) from the Design to the Cloud server.

- Keep track of PCN, EOL, redundancy, obsolete information and compliance status for the components in the database.
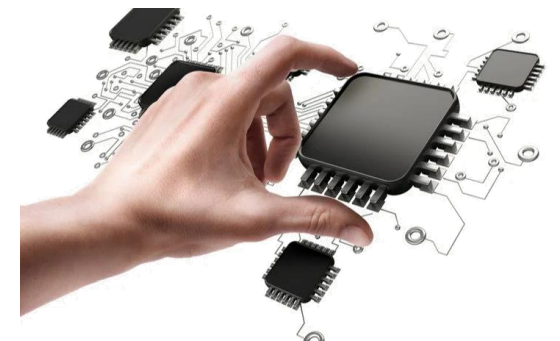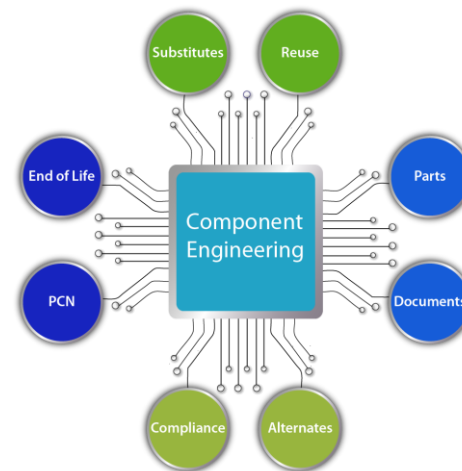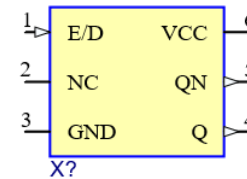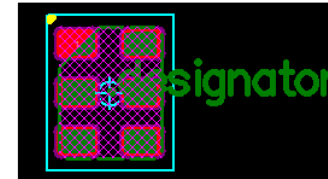
Design Team Process

Design Team

- Check for the existing Symbol, Footprint that can match with the requested component.

- Create required Library files – Symbol and Footprint.

- Use Library design standards with best practices and IPC.

- Share the library details to the component Engineer with Library files.
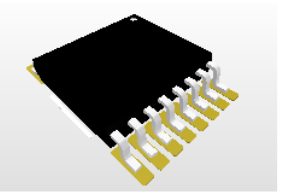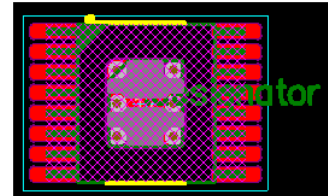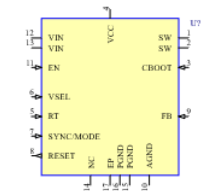
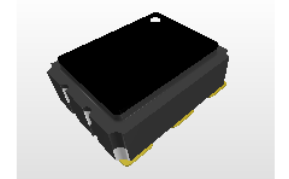- Ensures data consistency across multiple ECAD tools

Component Request → Datasheet Verification → Library Creation → Validation → Delivery → Update to Database

Symbol | Footprint | 3D Model

SPICE Model / SPICE Sub-Circuit / IBIS Model (SI) / Symbol / Footprint / 3D Body + Parametric Database → Database Library (*.DBLib)

Component Library Management with Cloud Integration
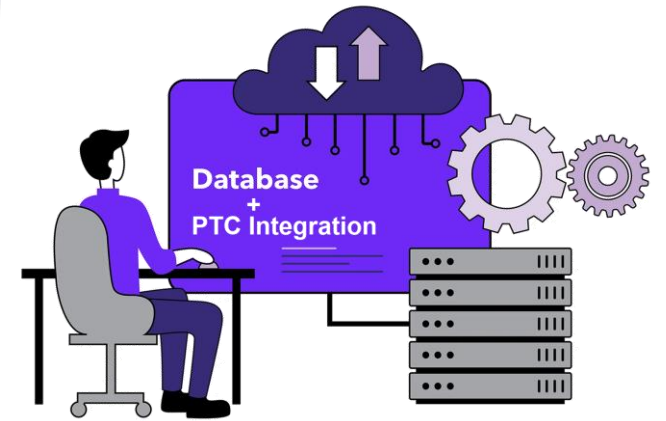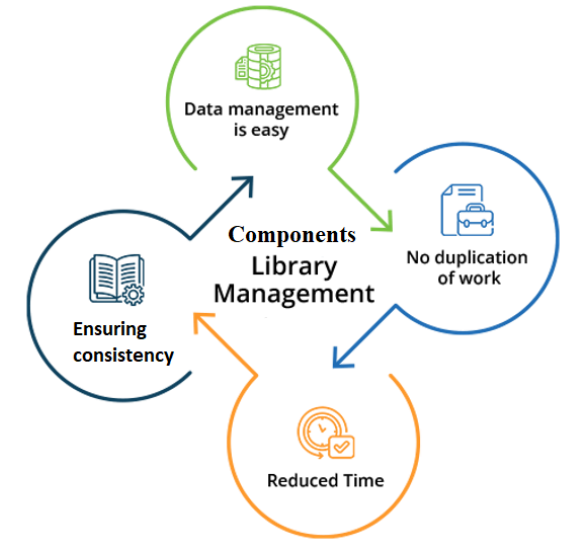
Customer Testimonial

Delighted to share a satisfied client's testimonial that serves as strong evidence of success and impact of the Components Library Management.

"We handed them the task of managing multiple libraries, numerous spreadsheets filled with component details, and libraries with variants of library standards. They not only satisfied our requirements, it was even better than our expectations. They efficiently streamlined our Library Management processes in cost-effective manner, that reduced errors, and ensured consistency across our projects. The capability to effortlessly update and share components across the team has saved us countless hours. Furthermore, their dedication to punctual deliveries has reinforced our trust in their capacity to manage demanding projects."

Conclusion

We provided the client with a Library Database (DbLib) that exactly fit their requirements. Displayed our strong commitment to delivering high-quality work and our technical expertise.

Our partnership goes beyond the technical aspects; it's about streamlining the Library Management process by combining our proficiency with a deep understanding of the client's needs.

We're committed to delivering top-notch Library Management services, which shows that we're good at what we do and can be relied upon to get exceptional results.