Different access levels are provided to users, depending upon their role in the system. Two types of control levels are provided in the system function level control and data level control.

In function level control user authorization is verified before the interfaces are displayed. If the user is not verified then user is not authorized to view the different menus.

In data level control user authorization is verified when user tries to access the data or want to modify the data. If the user is authorized to do so then further action will take place otherwise message will be displayed that user is unauthorized to perform the operation.

- Dynamic Authorization Assignment Strategy Based on Task, Role and Time:

  By using different rules control strategy of multi user management is adopted to harmonize operations, avoid some mistakes such as data loosing and recovery. Set theory is used to design the different rules.

- Distribution Technology of Invocation Conflicts:

  The invocation conflict appears in system, while software invocation and document invocation. The real-time invoking priority should be assigned when the same software/document in the server is invoked by multi users. Each user, software and document is assigned as a node and data invoking priority is assigned to each node.

- Weighted Retrieval Algorithm Based on Dissimilarity:

  The resource configuration history and production scheduling history are saved in databases as instance to provide references for next scheduling. The weighted retrieval algorithmic based on dissimilarity is adopted to search useful instances more rapidly and exactly.

- Introduction of effective IT operations and processes (right sourcing, ITIL/ITSM).
- Consolidation of DPCs (Data Processing Centre) in order to reduce complexity and to provide reliable infrastructure for ERP systems and MES,
- Use of communication technologies with support of SLA (Service Level Agreement).
- Tracking of material flow with using barcodes and RFID (Radio Frequency Identification).

Machine Control	Automation	Profibus, Device/Control net, EthernetIP(CIP)
	Integration Level	MES, MMS/OPC/DDE gateways
MES/ERP	Middleware Components	OPC, WebSphere, B Star
	Data Management	SQL DB, XML, Data warehouses, OLAPs
	Security	Firewalls, Antivirus protection, VPN/LAN with IPSec
	Server IT platforms	HW/RISC/Intel (Clusters, Blades, SANs), SW OS (UNIX, WINTEL)
	Network	Thin client with Windows xp, Linux
	Communication service	GroupWare, Email, LDAP, ADS
	Communication protocols and infrastructure	TCP-IP, secure DHCP, DNS
	Network Infrastructure	Ethernet (10/100 Mbit and Gigabit 10G), WLANs (802.11x), WAN (MPLS)

Figure 3. Building blocks of MES for manufacturing [4]

3.4 MIS for Attendance capturing and Recording [5]

The MIS is implemented for attendance capturing and recording of the employees of the organization. An author used punch card reader to mark the presence of the employee. Each employee punches his card into the punching machine. The punching machine reads