

A3.7 DEL SOLUTION: SSAD APPROACH**DEL: Systems Analysis***✓ System Views***1. Business Function View: Business Systems**

- Finance, accounts and administration
- DVD procurement and Inventory management
- Customer relations and marketing
- HR management

2. Function View: Functional Systems

- Finance, accounts and administration:
Budgeting and planning, accounting of business transactions, receipts and payments, tax management, funds management, accounting of assets, expenses and analysis. Finance administration w.r.t. receipts, payments, management of receivables and payables, bank reconciliation.
- DVD procurement and inventory management
Purchase requisitioning, processing, procurement, inventory management, maintenance of Kardex, inventory analysis based on value, movement, life of DVD, disposal, purchase order management, order tracking, closure, bill passing and payment.
- Customer relations and marketing
Membership management: booking, follow-up, membership fees payment, renewal.
Customer (member) relations: enquiry, complaint, special request processing. Customer analysis by region/branch, age, choice of DVDs, feedback on services. Marketing: membership drive management: contacting, selling and obtaining the membership. Special schemes management.
- HR management
 - Recruitment, training, reviews, promotions.
 - Attendance and leave management and transfers.
 - Payroll and salary administration.
 - Performance reviews, incentives and grievance handling, suggestion schemes.
 - HR skills development.

3. Modular View: Application Systems

For the sake of brevity, customer relations and marketing is taken to explore a modular view through the application system. For the remaining functional systems, the reader is advised to work on the modular view. The applications in the customer relations and marketing are given here

- Customer relations
 - Member enquiry and processing and follow-up
 - Member registration
 - Customer analysis: enquiries, complaints, requests, suggestions, age-wise analysis, DVD *versus* customer analysis, information drive and contacts for business drive.
- Membership Management
 - Automatic renewal
 - Payment advices
 - Follow-up for payment
 - Membership analysis by value, DVD
 - Trend analysis
- Marketing
 - Communication to members on new arrivals of DVD.
 - Special marketing schemes for membership drive and promotion of popular DVDs.
 - Market research on DVDs and preference of members, purchase requisitioning after market research findings.

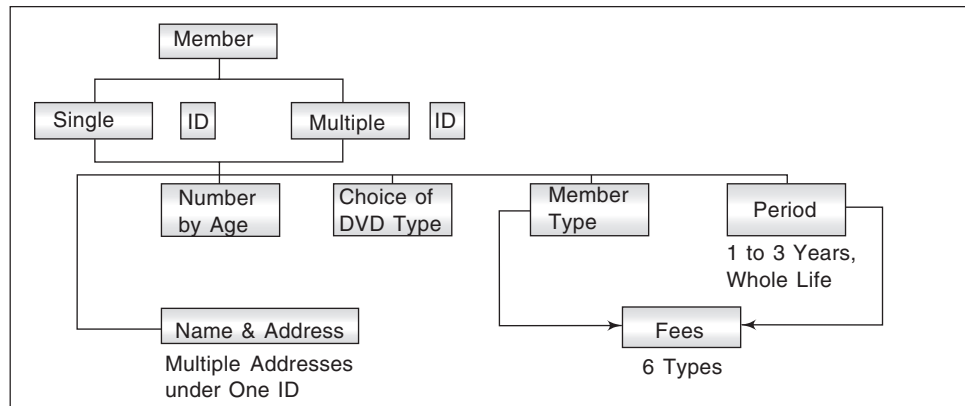
4. Process view: Transaction Processing Applications

We will take a view on Membership Registration (MR). The transactions required to process registration are as follows:

1. MR form entry
 - Paper, web
2. Form processing for validation and verification, correctness and completeness.
3. Membership accounting: number of member types, choices and so on.
4. Membership fees computing.
5. Decision and communication to the member along with payment advice.
6. Payment follow-up and payment processing (use of smart card eventually).
7. Issuing member ID card and password and seeking acknowledgement of its receipt by the member.
8. Application for automatic issue of intimation letter, reminder and payment follow-up letters.
9. Update member/database.
10. Open a member account in finance and accounts system.

5. Data View: Data Processing System

Let us take 'Member/Customer' as an entity for understanding the data/attributes.



ID is unique for member type and address and has no relation to other attributes of the members.

ID is not duplicated or repeated.

Data structure is relatively simple, Hierarchy is not deep and complex. Validation and verification will be around data characters. The focus is on the following:

- Completeness of the form.
- Ensure mandatory data fields like phone number, e-mail, membership type, at least one choice of DVD type.
- Validate fee amount and bank and cheque details.
- Error reports, if any.

6. The System Type

Deterministic and fairly closed as very little exchange of information is required with other systems. It is not sensitive to environment in which it operates. Behaviour of systems/application is predictable with high degree of certainty. The system can be termed as stable for a year or two. Modifications, changes in the system may come due to technology, and competition moves.

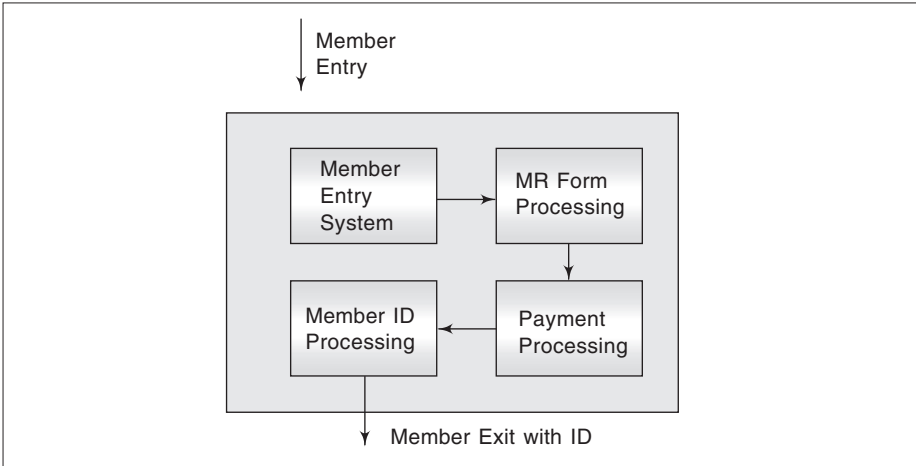
7. System Model: Use of Template

MR form Entry		
Inputs	Process	Output
<ul style="list-style-type: none"> • Web form Entry and Processing • Manual Entry of MR form 	Verify Validate Check Accept/ Reject	<ul style="list-style-type: none"> — Update Member Database — Intimate Member — Reminder for Payment Member
	Keep the Record on Hold till Fees are Paid	<ul style="list-style-type: none"> — Trigger Member IDp Processing

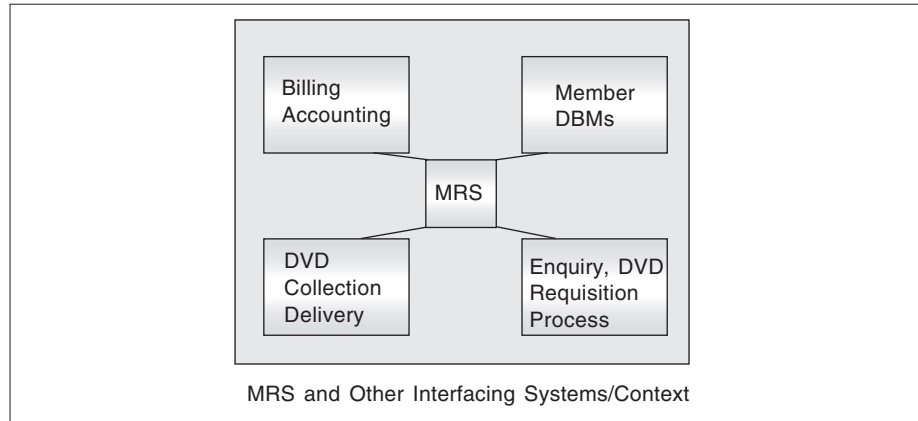
8. Structured Systems Analysis for MRS

Block diagram, context diagram, work flow diagrams, DFDs, system flow chart

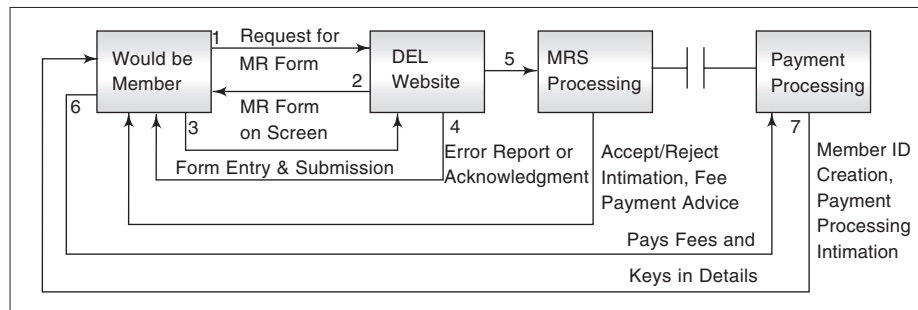
- MRS Block Diagram



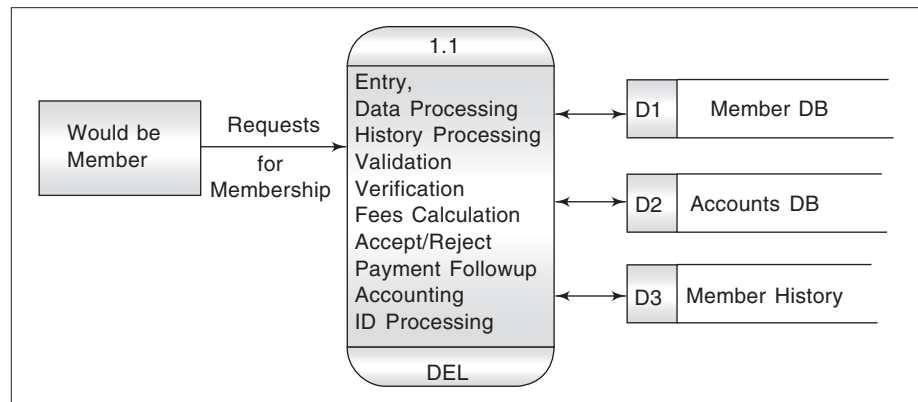
• MRS Context Diagram



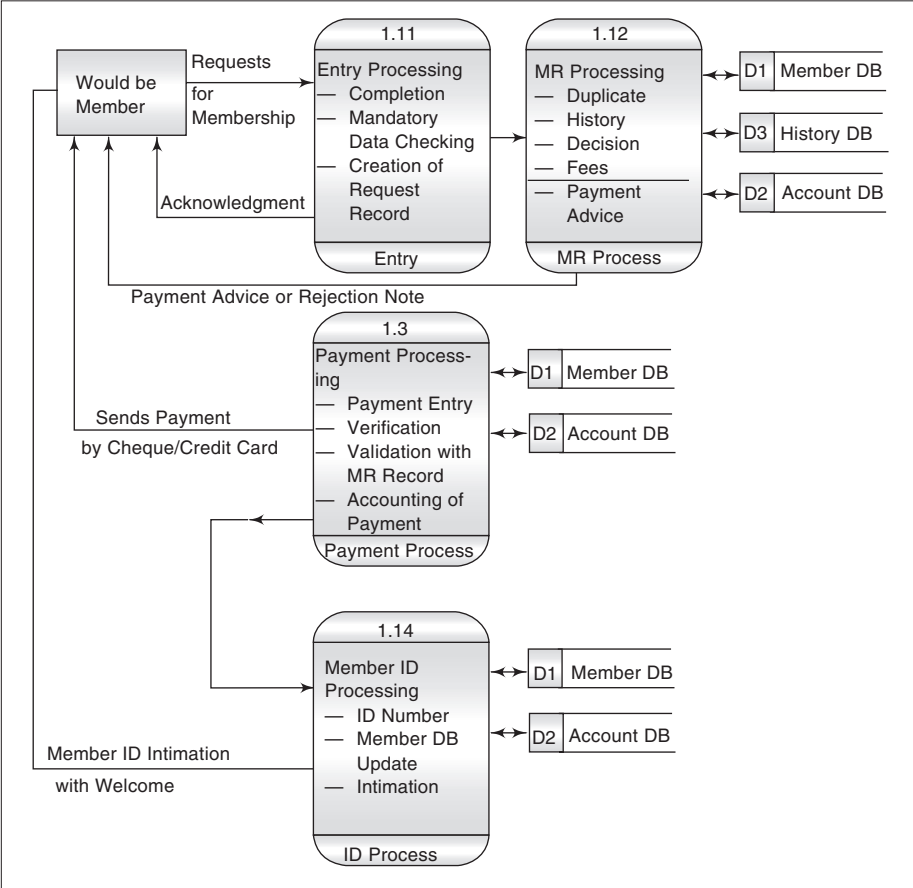
• MRS work flow



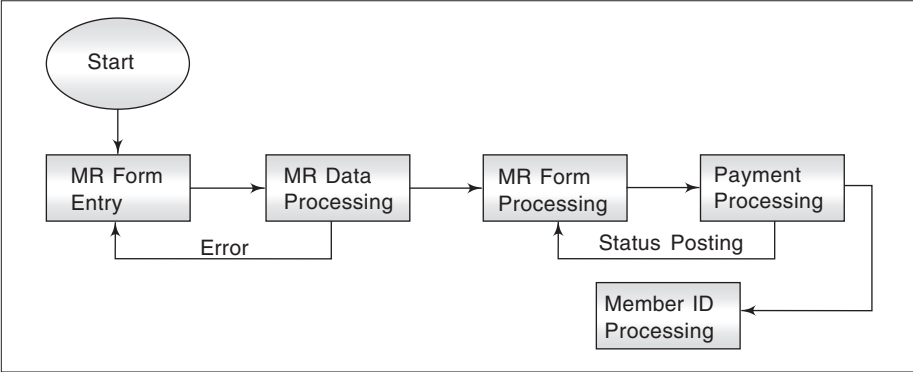
• Level-1 DFD of MRS



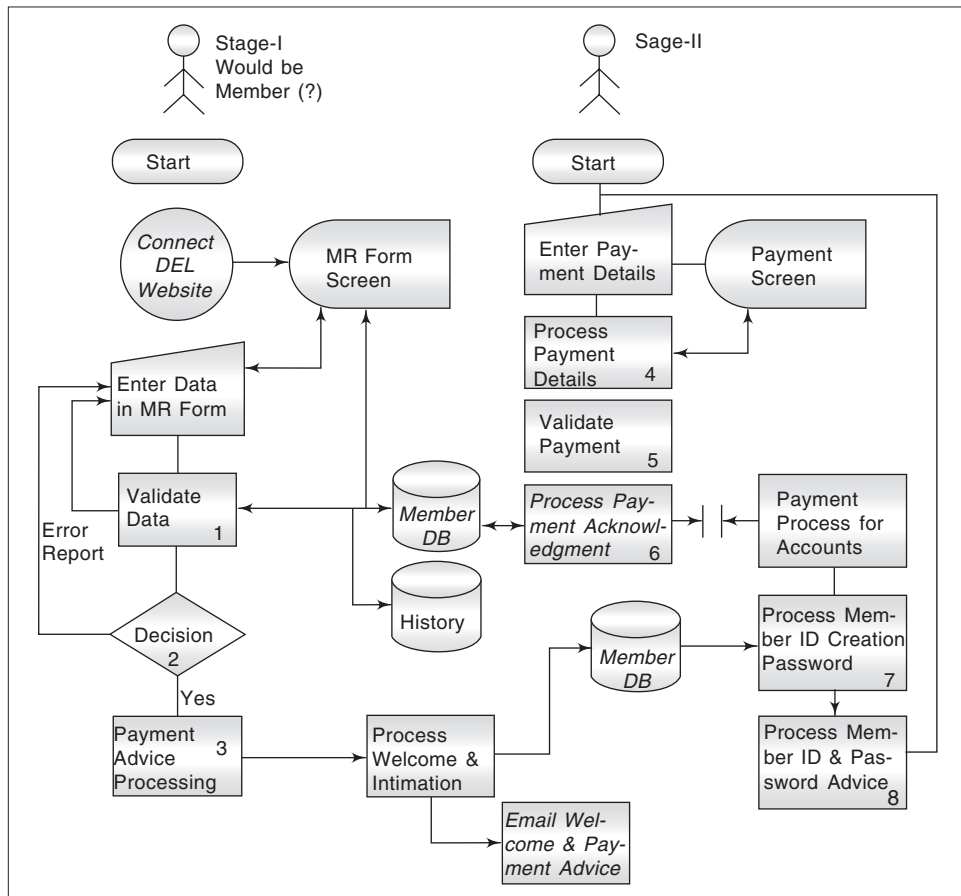
• Level 2 DFD: MRS application view



• MRS system flow chart



9. MRS: Software System Flow Chart

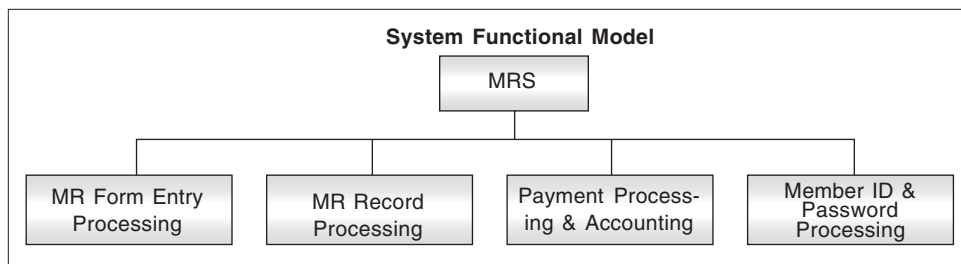


- Screen validation for completeness and mandatory data
 - Check for duplicate member.
 - Check member history.
- To decide on membership based on history.
- Payment advice process
- Process payment details
- Check amount with payment advice and validate.
 - Counter check payment amount with membership type.
- Payment acknowledgement
- Process member—ID is triggered on completion of accounting of payment and after member DB update.
- Process Advice intimating member ID

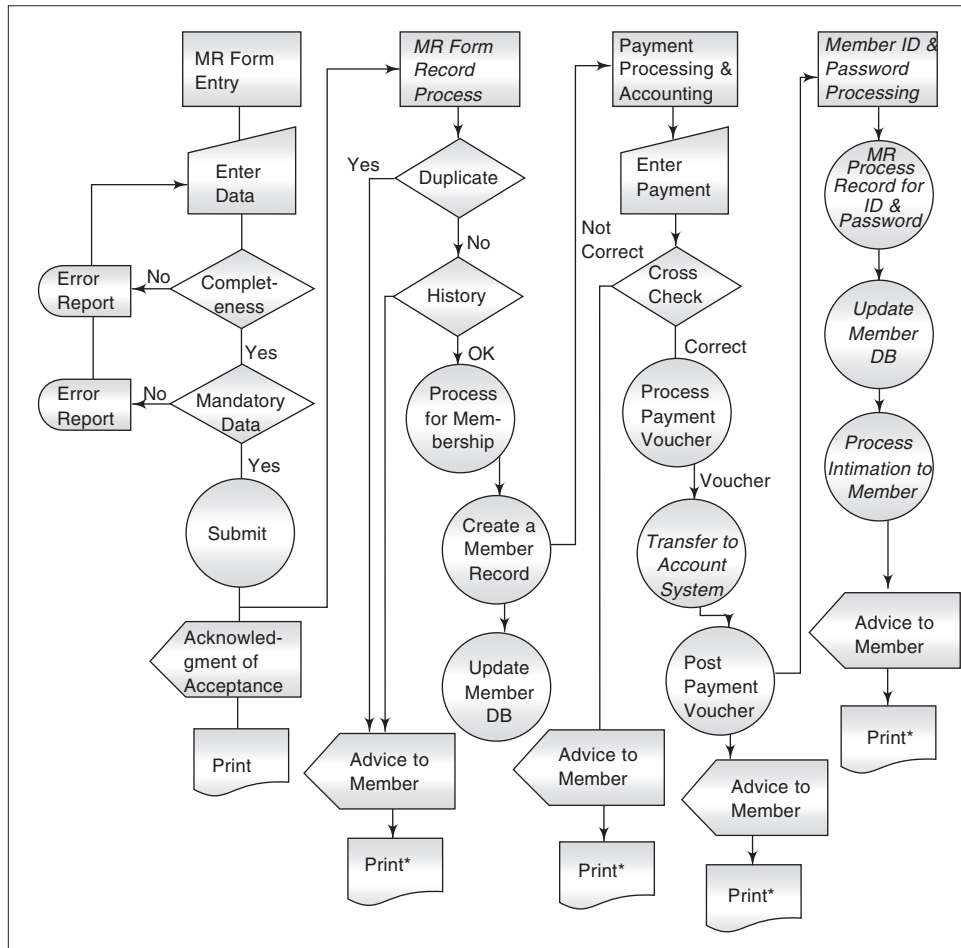
10. MRS: SRS Specifications

1. Requirement specification code – R.03 MRS
2. Main processes: MR entry, MR processing, decision, payment advice processing, payment entry and processing, member ID processing, member DB update, accounting of payment.
3. Number of programs (estimate)

MR entry:	Entry, checking, submission	3
MR processing:	Duplicate, validation, history checking	3
Decision:	Evaluation	1
Payment processing:	Computation, advice, intimation by e-mail	3
Payment entry:	Entry, checking, cross validation	3
Member ID creation:	Processing, creation, recording, update DB	4
Accounting of payment:	Transfer to account system and processing the payment voucher.	3
	Total estimated programs	20
4. Features: Web features of MR and payment entry system.
 - Duplicate member message
 - Submission acceptance only on completion of form data including mandatory data.
 - Automatic acknowledgement, intimations and e-mail.
 - Hold MR record till payment is received.
 - Automatic payment voucher creation and posting in the books of accounts.
5. Facilities: Where required, print facility for printing and mailing advices, acknowledgements etc.

11. MRS: System Design

12. MRS: Software System Process Flow Model

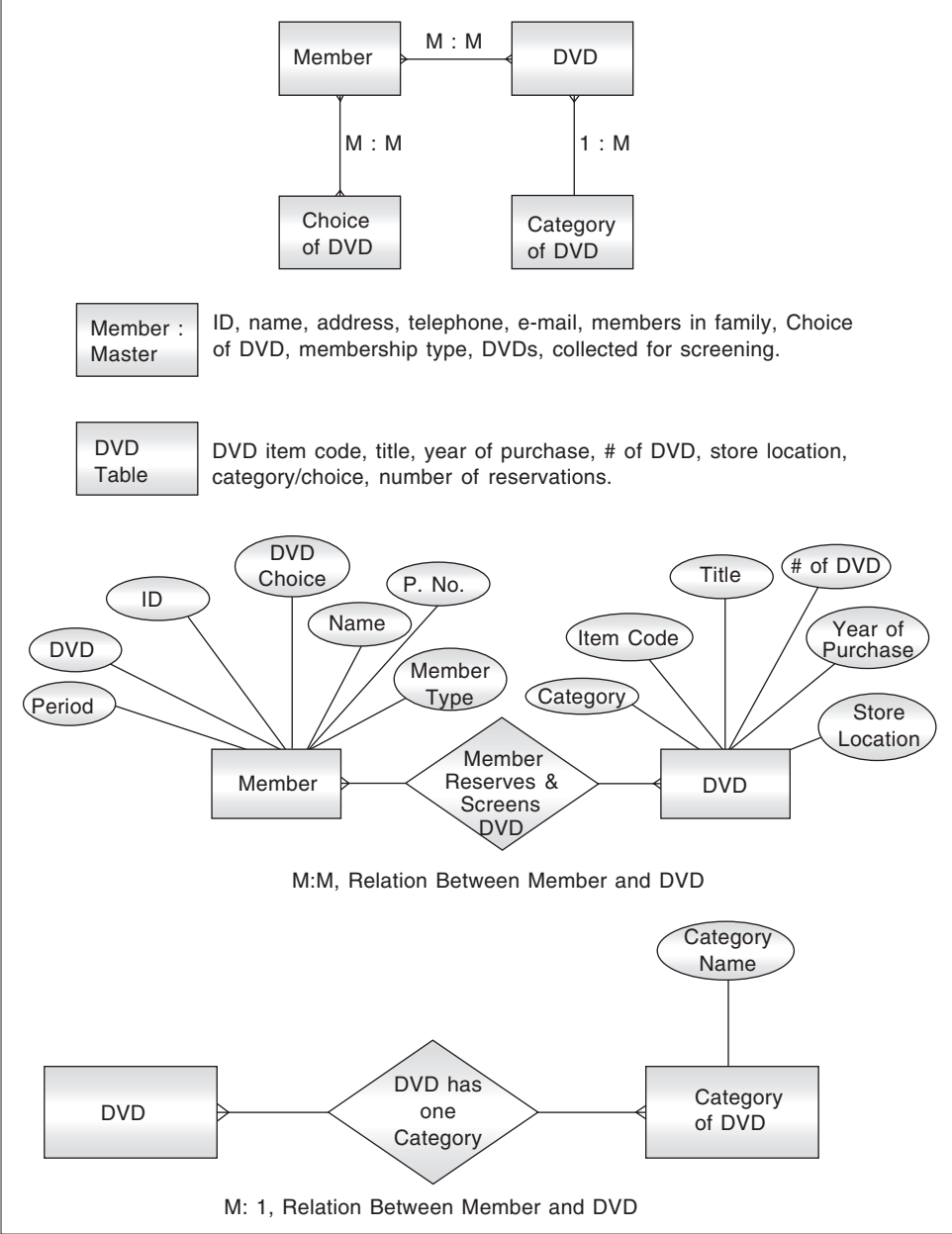


The system is designed with four modules. Each module is independent in itself and autonomous. The program steps are self-reliant and are cohesive units, with little or no interaction with other parts of the system. They are logically coherent. We can make two program clusters, one, MR form entry and processing and second, payment processing and member ID processing.

13. System Design Diagrams

- DFD: already shown in (8)
- System flow charts: already shown in (8 and 9)
- ERD: entity relation diagrams

Main entities in the system are member and DVD. Member has a unique ID and password and other personal details, and choices of DVDs. Similarly, DVD has a unique Item code and other item details. There is a relation between member and DVD.



14. Masters in the MRS

Member master:	Member ID, date of membership, name and address; type of member
DVD master:	DVD item code, title, type, date of purchase.
Branch master:	Branch code, address, P. no.
Employee master:	Employee code, name, designation, branch, home address, telephone.
Vendor master:	Vendor code, name, address.

15. Test Strategy

<i>Unit test</i>	<i>Test focus</i>	<i>Error message</i>
<ul style="list-style-type: none"> MR form data entry test 	<ul style="list-style-type: none"> Entry process Accepts specified field length. Mandatory field checking Acknowledgement on submission of form 	<ul style="list-style-type: none"> Does not move to next field. Not specified length. Not within specified value. Specific fields name absent. Does not acknowledge
Application test <ul style="list-style-type: none"> Member payment processing 	<ul style="list-style-type: none"> Gets correct member record Enters payment detail, checks for validity and correctness. Not correct payment. Creates automatic payment voucher. Voucher transfers to accounting system. Creates advice to member. 	<ul style="list-style-type: none"> Incorrect member record Incorrect payment details Incorrect payment amount No automatic voucher, check '<u>data</u>'. Transfer failed. No advice possible, check '<u>data</u>'.
Integration test <ul style="list-style-type: none"> MRS testing 	<ul style="list-style-type: none"> Moves in steps as shown in flow chart. Creates all intimations and advices Shows charged account status. Should show correct balances Updates member database with ID and other details. Should increase member strength by 1. 	<ul style="list-style-type: none">

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<i>Unit test</i>	<i>Test focus</i>	<i>Error message</i>
<ul style="list-style-type: none"> Customer acceptance test 	<ul style="list-style-type: none"> Delivers correct results through paper form entry. Delivers corrects results through Web entry form. GUI and CUI. Checks member history in case of old member (but discontinued). Does not accept duplicate member Checks on member ID and password Security. Picks up correct payment specifications Correct communication processes between member and DEL. Automatic payment voucher creation and its posting in books of accounts. 	<ul style="list-style-type: none"> Incorrect Incorrect Duplicate member with ID. Incorrect payment amount Shows wrong balance
<ul style="list-style-type: none"> Traceability analysis: 	<ul style="list-style-type: none"> RDD about member registration 	

16.**MRS: Deliverables**

- Web-based registration i.e. e-registration system as per R.03 MRS.
- Manual registration through paper form-based system
- Stage-wise intimations/advices/acknowledgement
 - Intimation on eligibility
 - Follow up letter for payment request
 - Acknowledgement for receipt of payment.
 - Welcome letter with member ID and password communication
 - Member database update
 - System for member ID generation and communication.