1. **Preface**
2. **Introduction**

The following document outlines the requirements for the creation of a software information system intended for use by a standalone movie rental store. The system should be able to allow the rental store staff to process the rentals of blu-rays, DVD’s and VHS cassettes to registered members and issue a receipt along with other various administration tasks outlined in the user requirements definition section. This document also outlines in detail and with graphical representations the system requirements, architecture, dependencies, models and evolution of the system.

1. **Glossary**

The following terms are used throughout the various requirements definitions:

**System:** the software, network and hardware aspects of the application can be referred to as system components.

**Software:** the part of the system that isn’t a physical object (such as a PC or server) and it comprised of programming code.

**User/End user**: the video store employee who is using the application

**Database/file**: the area of the application where the data is stored

**Data**: any information stored or inputted into the system by the user

1. **User requirements definition**

There are certain key day to day operations which need to be carried out by a movie rental store clerk/manager and the software needs to allow these users the facility to carry out the following operations in quick and easily executable steps:

* **Create a customer**: the user shall be able to create a new customer by entering their key details (name, address, phone number, e-mail address) into the software which will immediately return a membership number for the customer and allow a rental transaction to be processed straightaway. Due to the ratings classifications on movie titles only customers aged 18 or over can create an account and proof of ID and address need to be provided.
* **Remove customer**: the user can remove a customer record from the system by searching for it using various criteria such as name, address or phone number and then choosing the remove customer function on the selected record.
* **Customer account maintenance:** the user shall edit or update a customer record including options such as name, address, phone number and outstanding transactions and fees. An account can be closed here rather than completely removing the record from the system as per the previous option.
* **Add title**: the user shall have ability to add a rental title to the system manually including details of the artists involved, format of the media and quantity of individual titles available in stock.
* **Delete title**: the user shall have the ability to remove a title from the system by searching for it using various criteria such as title, director or actor and then choosing the remove title function on the selected title.
* **Rent title**: the user shall have the ability to rent a title to a customer which remove a quantity of 1 of the title from available stock and place it at a “rented” status against the customer’s record. At this point the user will have the option to take payment for the transaction and issue a receipt to the customer if required. The user can also see if the customer owes an amount/fee on a previous late return of a title.
* **Return title**: the user shall have the option of taking returned titles and marking them as “returned” against the customer account which in turn increases the available stock for the title by 1 so it is available for rental again.
* **Late returns**: the user shall have the option of applying a fine for late returns based on the number of days over the due return date the title has been physically returned. The user can take payment of the fine or leave it outstanding on the customer’s record until it is paid in future.
* **Reserve a title**: the user shall have the option to reserve a title against a specific user account.
* **Maintain stock**: The user shall have the option of manually adjusting the stock quantity of movie titles in the event that titles are lost, found, damaged or stolen.
* **Stock checking**: The user shall have the option of generating a full stock check for all titles in the inventory.
* **Reporting features**: The user shall be able to run predefined reports or create their own bespoke queries to obtain, for example, a list of expired customers, a list of late returns, a list of customers with amounts outstanding, a list of reserved titles or a listing of available stock.

Due to the high volume of turnover in transactions at peak times it is a requirement that none of the above processes should take longer than 30 seconds to complete by a trained experienced user. The system should also be easy to use with each operation requiring a minimum number of steps to enter the data and process the transaction.

It should take no longer than 2 hours to train a new user on the standard functions of the system.

The system must be available 99.99% of the time during trading hours (11:00 – 22:00, 7 days a week) with any scheduled maintenance to take place outside of these hours.

For security and audit purposes each user will be required to enter their own login and password to access the system and this password will be required to be changed every 2 months and cannot be a password which was previously used by the same user.

It is required that the data be backed up on a daily basis and this will be scheduled to run automatically at 23:00 each evening when trading has ceased.

The system must comply with the Data Protection Acts 1988 & 2003 which governs the protection and privacy of individuals with regards to personal data in particular in relation to the processing, right of rectification, security and transfer of personal data.

The system will also hold transactional data and audit logs for use during a financial audit.

The system will be tax compliant and have the ability to issue receipts, statements, tax statements and VAT reconciliations on request.

1. **System Architecture**

Having analysed and consulted with the Video Store management a decision has been reached that the most appropriate system architecture to use is a Client-Server setup using a web browser application accessed through the 3 PC’s in-store (via their network) with the database residing in a hosted environment. This will keep costs low and as the store currently has a high speed broadband connection there will be no issues regarding speed of data transfer.

Security measures will be enforced in relation to the data transfer using encryption (AES 256 bit encryption during transfer), the requirement of credentials and the security on the store network will be bolstered by adopting user intrusion software and employing the use of a router and switch either side of the firewall between the network and application web server.

On each PC running the application the users will require an internet connection (to the local network) and a web browser (Google Chrome, Microsoft Internet Explorer, Mozilla Firefox, Opera) no less than 3 versions lower than the most recent update. Updated anti-virus software is also required. Operating system on PC must be Windows 7 or Windows 8.

1. **System requirements specification**

The system database will be a relational database comprised of 4 main files linked together using unique references for combinations of movies, customers, transactions and payments and this same structure will form the basis of the application :

**Customer file**: This file will store data pertaining to the customer record including the following fields – unique reference (membership number), first name, surname, date of birth, address (lines 1 to 5), gender, number of previous rentals, rental transaction sequence number, date added to system, date account closed, account active flag, account stopped flag, customer fine amount outstanding, current rental 1, current rental 2, current rental 3, current rental 4, current rental 5.

The customer unique references will begin at 10000 and increment sequentially to an upward limit of 99999999.

**Movie file**: This file will store data pertaining to the movies which can be rented in store including the following fields – unique reference, movie name, movie format, year, director, studio, genre, ratings classification, actors 1, actor 2, actor 3, number of movies in stock, number currently rented, overall stock quantity, date added to system, price of rental, barcode number, reserved membership number 1 – 20,

The movie unique references will begin at 10000 and increment sequentially to an upward limit of 99999999.

**Transaction file**: This file stores all details of all transactions for movie rentals. Each transaction has its own unique reference number which is the key for the file. Other fields on the transaction file include – transaction date, customer unique reference (membership number), movie unique reference, staff member id, amount paid, date due return, actual return date, adjustment reason,

The types of transactions which can be recorded are “OUT” for a rental, “IN” for a return, “ADJ” for a stock adjustment and “PAY” for a payment.

The transaction unique reference willbegin at 1 and increment sequentially to an upward limit of 99999999.

**Accounts file**: This files keeps a record of all financial transactions carried out and is reconciled against the store receipt amount in the cash register at the end of each day. The fields on this file are: payment unique reference, customer unique reference (membership number), amount paid, payment type, payment date, user id, VAT amount, transaction unique reference 1 – 10.

The payment unique reference willbegin at 1 and increment sequentially to an upward limit of 99999999.

The system will also contain some smaller files for storing user data (user details, priorities within the system etc), system parameters and configuration data.

The user will update the files in the database using a combination of the following transactional methods:

* **Create a customer**: the user shall be able to create a new customer by selecting the “Create new customer” option which will open a form where they can enter the customer’s key details (minimum requirement is name, address, phone number, e-mail address) into the system which will immediately allocate the next available membership number from the customer file to the customer record.
* **Remove customer**: the user can remove a customer record from the system by entering the membership number or else searching for the record using various criteria such as name, address or phone number and from the resulting list choosing the “Remove Customer” function on the selected record. This will remove the entry from the customer file but the customer unique reference will still be stored against the transactions and payments entries in the other system files for historical data purposes.
* **Customer account maintenance:** the user shall have the option to edit or update a customer record including options such as name, address, phone number and also the option to settle or write-off outstanding fees. Upon saving the record the changes are immediately written back to the database. If a fee is processed the data will update to the Accounts file and a receipt automatically printed which includes the membership number, date, amount paid, amount outstanding, staff member name, vat number and registered business number.
* **Add title**: the user shall have ability to add a rental title (or numerous titles sequentially in a batch) to the system manually. Mandatory data which will be required to be entered by the user are the movie title, movie year, format of the media, movie classification rating and quantity of individual titles available in stock. Optional data which can be entered includes the movie director, up to 3 actors and the studio name. When the ‘save’ option is selected the data will be written to the Movie file and immediately allocated the next available unique movie reference number and written back to the database.
* **Delete title**: the user shall have the ability to remove a title from the system by searching for it using various criteria such as title, director or actor and then choosing the “Remove title” function on the selected title. They can also remove the movie by scanning the barcode or entering the movie reference number and selecting the “Remove title” function. The movie entry is then removed from the Movie file in the database but historical transactional data will remain in the Transaction File.
* **Rent title**: the user shall have the ability to rent a title to a customer which removes a quantity of 1 of the title from available stock in the Movie File, increase the quantity rented on the Movie File and place it at a “rented” status against the customers record in the Customer File. The transaction updates to the transaction file (an “OUT” transaction). At this point the user will have the option to take payment for the transaction and issue a receipt to the customer if required. This payment will generate an entry in the Accounts file. The user can also see displayed onscreen if the customer owes an amount/fee on a previous late return of a title. If this amount is settled it will reduce the “customer fine amount outstanding” on the Customer File for this customer and will generate an entry in the Accounts file. A receipt is then automatically printed which includes the membership number, date, title(s) rented, amount paid, amount outstanding, staff member name, vat number and registered business number of the movie store.
* **Return title**: the user shall have the option of taking returned titles and marking them as “returned” against the customer account (in the Customer File)which in turn increases the available stock for the title by 1 (in the Movie File)so the quantity is available for rental again. It also reduces the “number currently rented” in the Movie File and enters a returns transaction (“IN”) on the Transaction File.
* **Late returns**: the user shall have the option of applying a fine for late returns based on the number of days over the *date due return* field the title has been physically returned. The system can compare the *date due return* against the current date and calculate a fine or this value can be manually overridden by the user. The user can take payment of the fine( in which case the Transaction File (“PAY” entry) and Accounts File are updated and a receipt printed which includes the membership number, date, amount paid, amount outstanding, staff member name, vat number and registered business number of the movie store) or leave it outstanding on the customer’s record on the Customer File until it is paid in future.
* **Reserve a title**: the user shall have the option to reserve a title against a specific user account. The membership number of the customer reserving the title is stored on the movie record in the Movie File and the available stock is reduced by 1 (but the rented stock does not increase until the customer collects the rental). A single movie title can have 20 copies reserved at any 1 time.
* **Maintain stock**: The user shall have the option of manually adjusting the stock quantity of movie titles in the event that titles are lost, found, damaged or stolen. An adjustment reason must be entered by the user. The adjustment is recorded on the Transaction file as an adjustment and updates the quantity in stock on the Movie File.
* **Stock checking**: The user shall have the option of generating a full stock check for all titles in the inventory (on the Movie File). The system will generate a printout which the user can use to visit all the rental shelves and write down the stock quantities. The stock quantities are then inputted on the system by the user (the titles will be listed on the screen in the same sequence as the printout to make the input easy as possible) and any changes in quantity are recorded to the Transaction File (“ADJ” entry) and updated to the quantity in stock on the Movie File.
* **Reporting features**: The user shall be able to run predefined reports or create their own bespoke queries to obtain, for example, a list of expired customers, a list of late returns, a list of customers with amounts outstanding, a list of reserved titles or a listing of available stock. For data security reasons reports which update values in the database are prohibited.

Default templates for reports which link the 4 main system files in various ways will be setup and can be used as a basis by the user for their own bespoke queries. This will reduce the technical knowledge and training required by the end user.

1. **System models**

Diagrams to be displayed here.

1. **System evolution**

The maintenance and evolutionary development of the system is expected to be relatively hassle-free and low cost due to the following factors:

* The application will be programmed using the Java programming language which is widely used and can be understood by most developers. The application will use an SQL database with a relational style structure which is also a widely adopted standard.
* A low failure related is expected with the application due to it’s relative simplicity and low reliance on external networks and data exchange.
* The application will be newly developed using up to date standards and technologies which will future-proof the system and protect against obsolescence.
* Maintenance and support costs will also be low due to the previously stated architectural elements of the system.
* The system will have good interoperability with other system if required due it being developed using Java where vast libraries of code can be called on to deal with other languages and data types.
* Full documentation and user notes are available for developers which define the system structure and processes.
* The system is easy to understand which will aid future development.
* Certain aspects of the system are parameterised and this can be used in future development if the behaviour of the program needs to be changed for example if new tax rates need to be applied after a budget change.
* Test data and test environments for the software exist and can be used as development environments for future system changes.
* The performance of the system isn’t dependant on end users with a lot of experience on the system and no IT knowledge is required.

1. **Appendices**
2. **Index**