



**Hochschule Offenburg**  
offenburg.university

**ENTERPRISE AND IT COMPUTING (ENITS)  
OFFENBURG UNIVERSITY OF APPLIED SCIENCES**

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**SOFTWARE SECURITY  
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## **PMS SYSTEM DESIGN REPORT**

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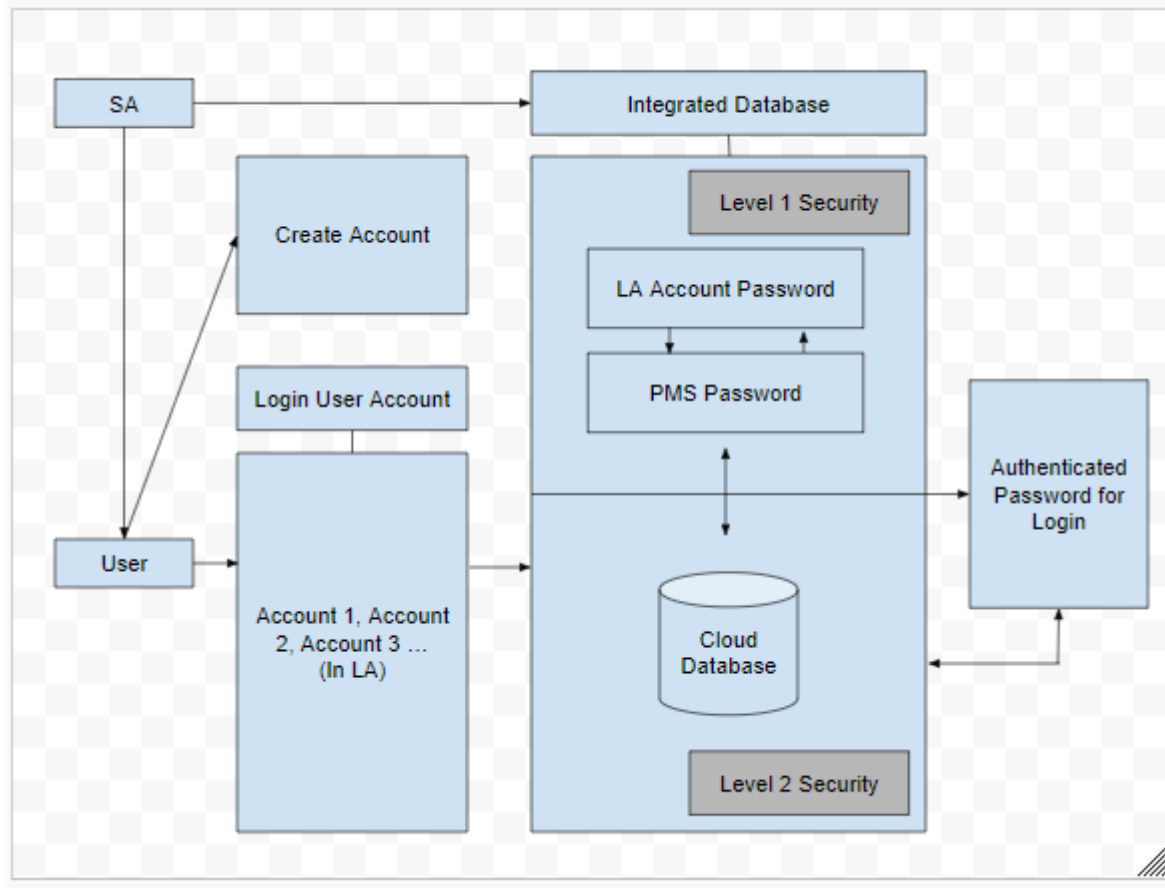
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## **DOCUMENT CONVENTIONS**

The following conventions are applied in this document:

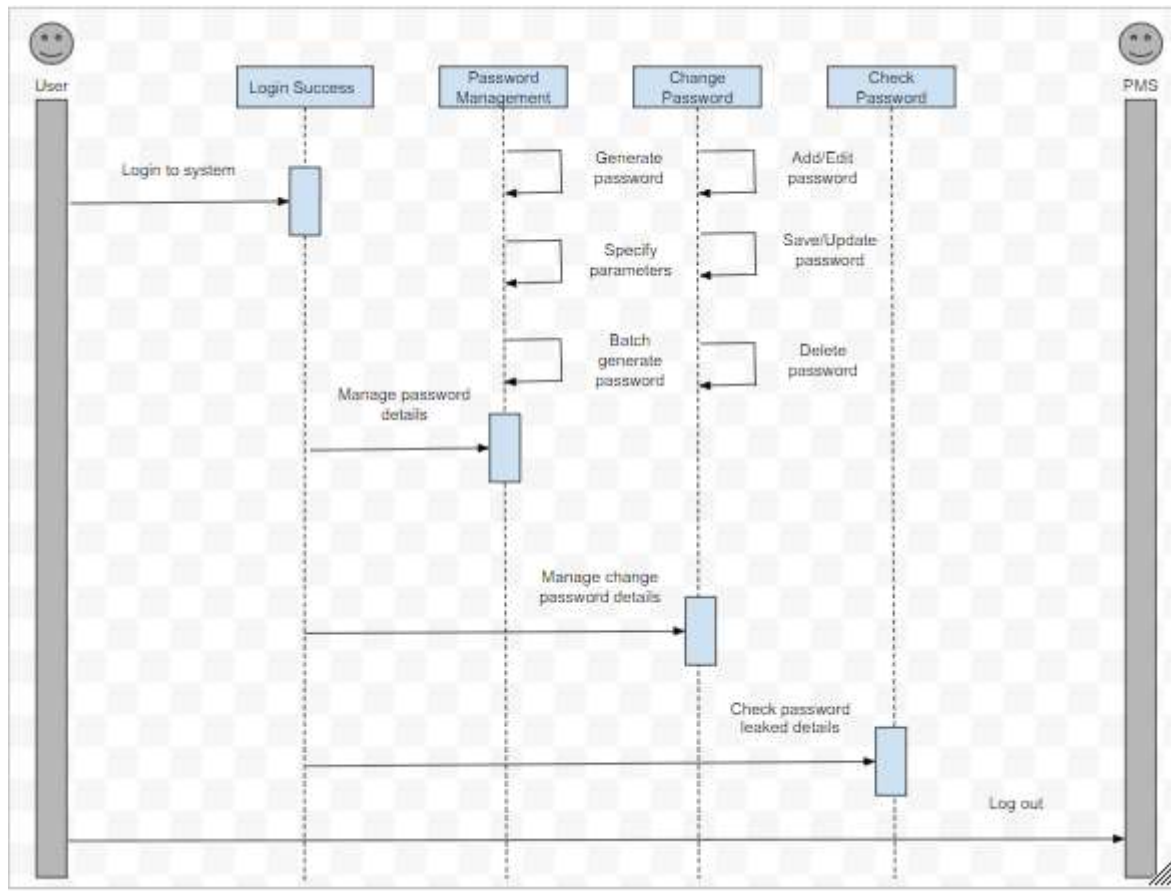
- PMS: Password Management System
- LA: Legacy App
- SA: System Admin

## TAM DIAGRAM

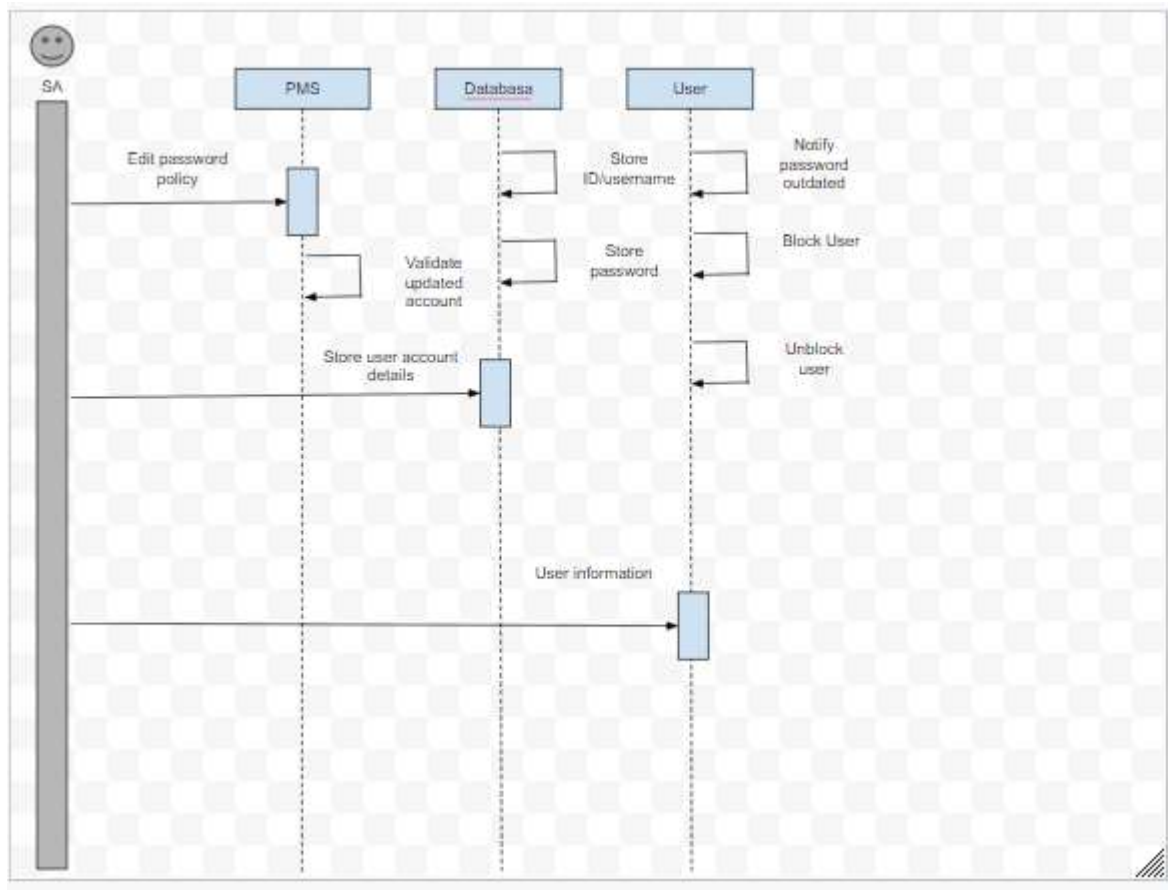


*Technical Architecture Modeling Diagram*

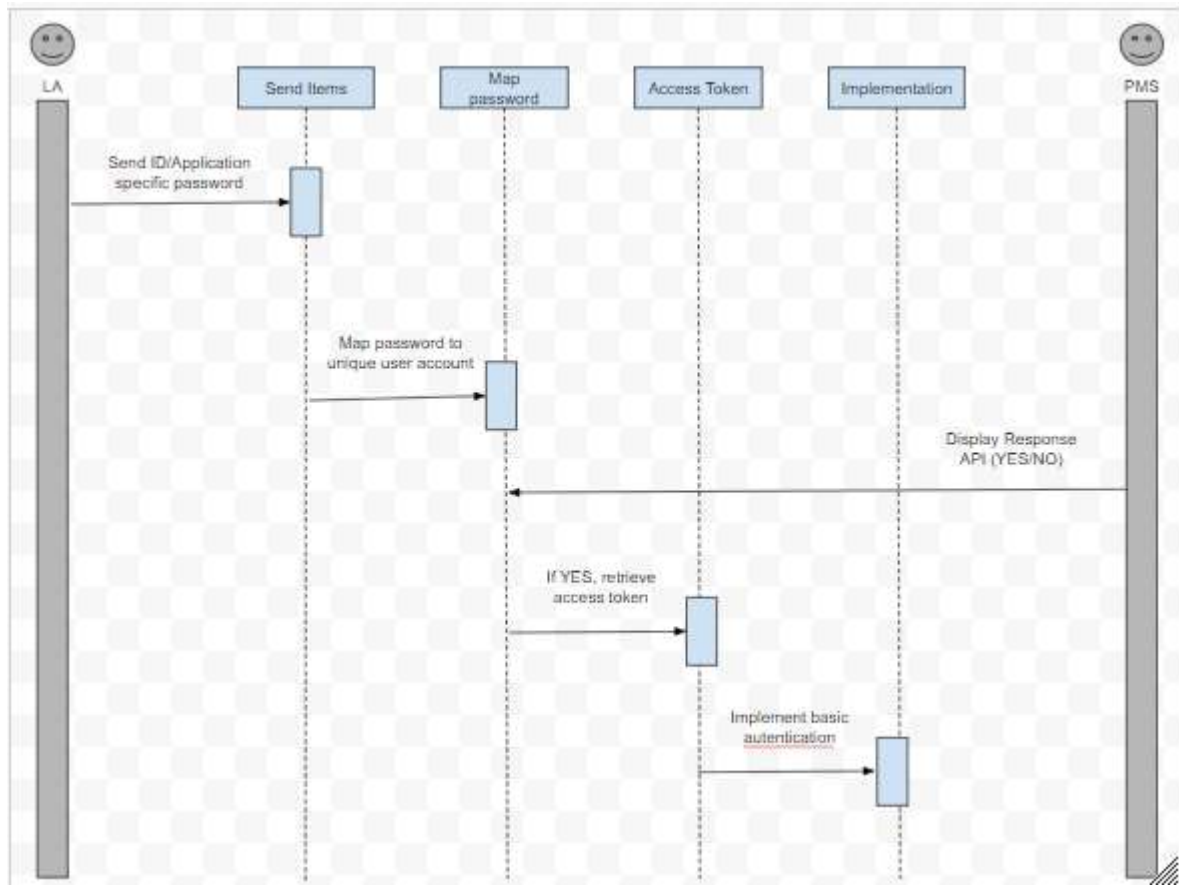
## SEQUENCE DIAGRAM



*User – PMS Sequence Diagram*

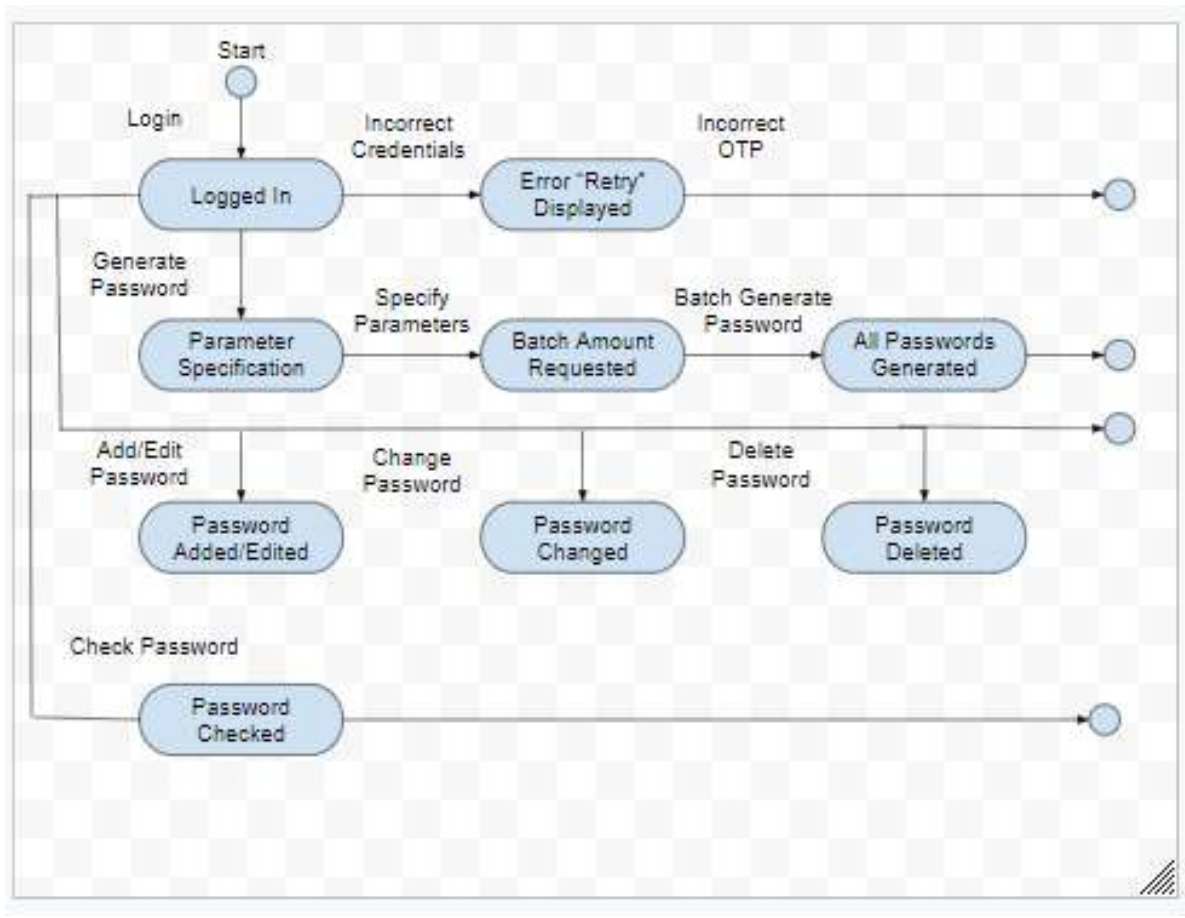


*SA Sequence Diagram*



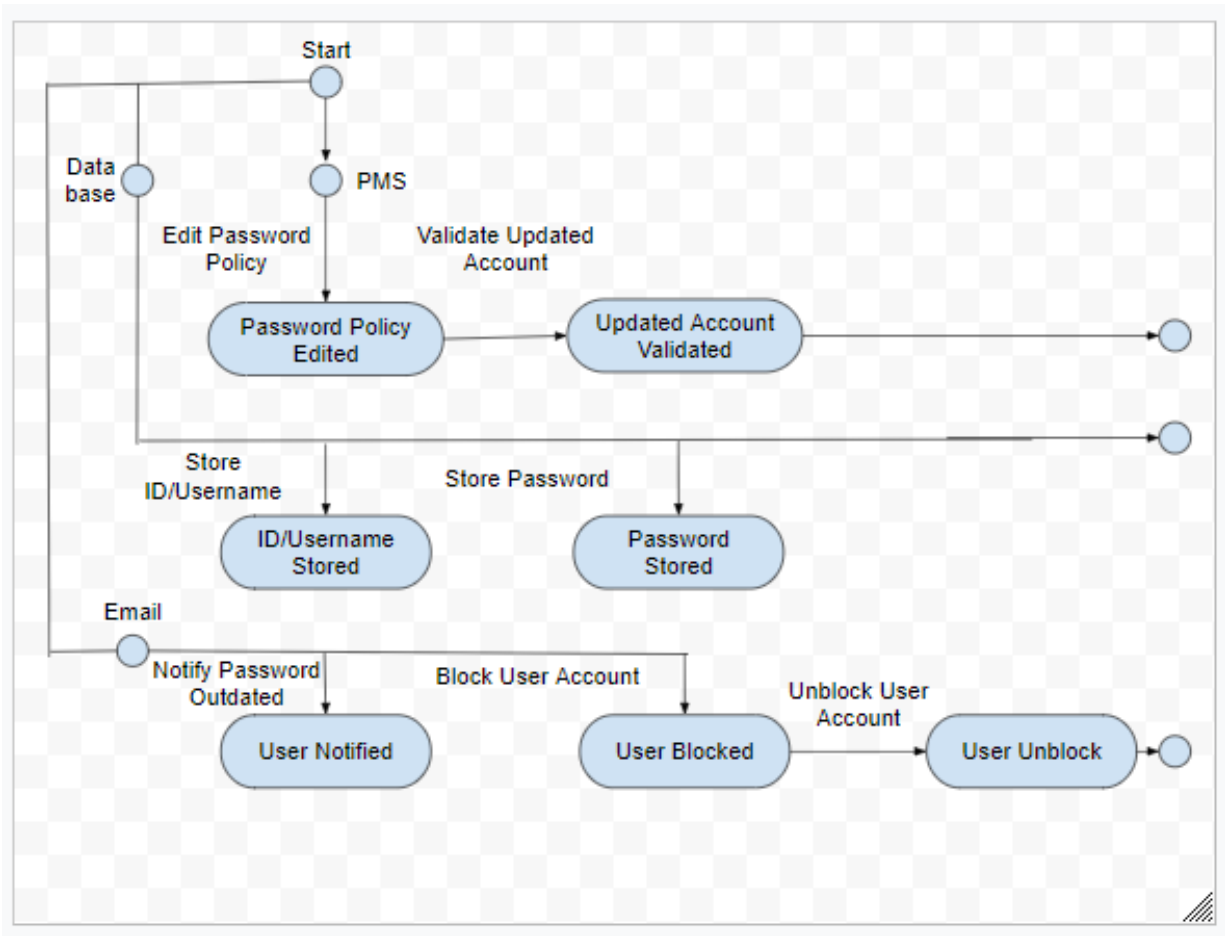
*LA – PMS Sequence Diagram*

## STATE MACHINE

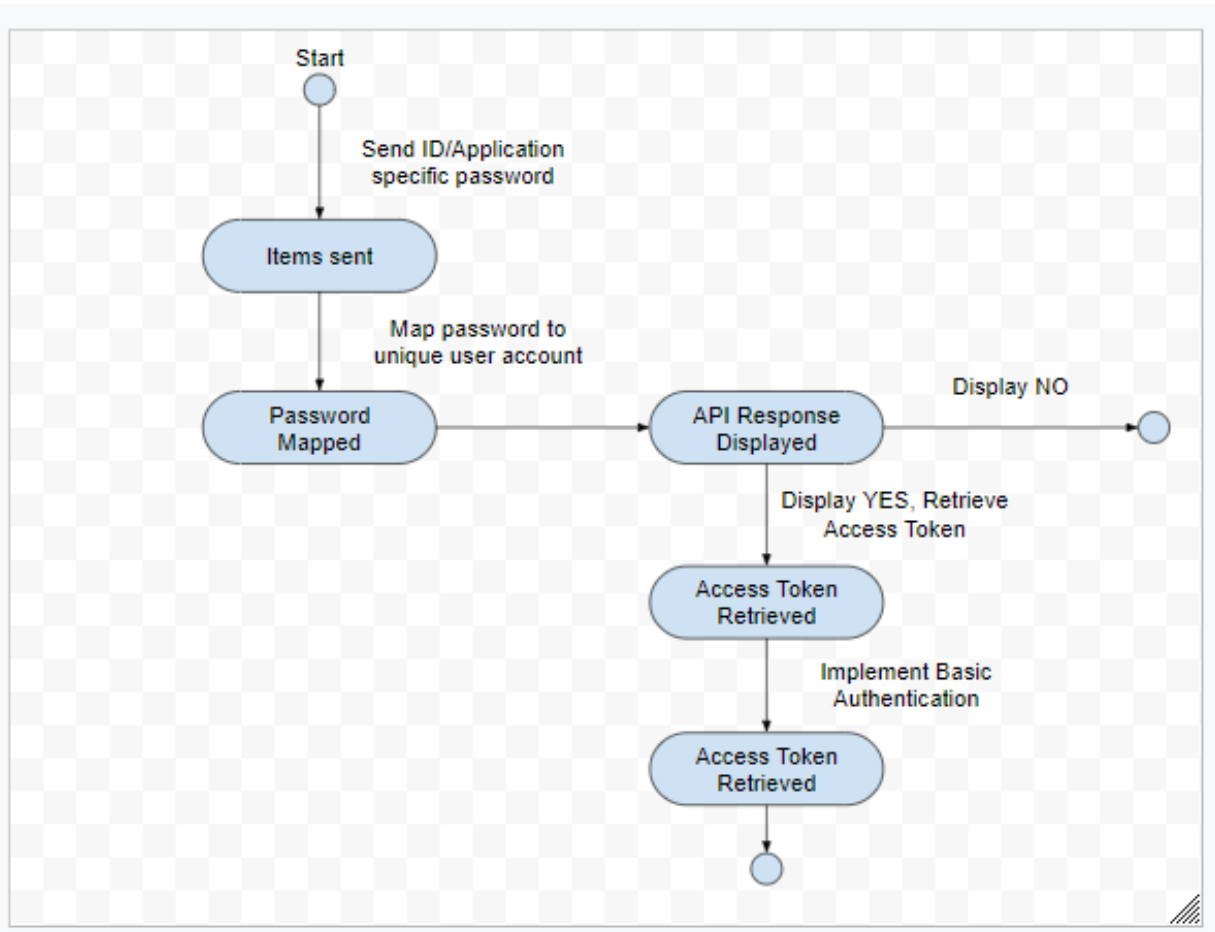


*User – PMS State Machine Diagram*





SA State Machine Diagram



*LA-PMS State Machine Diagram*

## DATA STRUCTURES

```
1 {
2   "name": "Password Management System",
3   "version": "1.0.0",
4   "description": "The Password Management System built connecting User/System Admin/Legacy Application, based on JSON.",
5   "main": "main.js",
6   "scripts": {
7     "postinstall": "install-app-deps",
8     "start": "electron .",
9     "pack": "electron-builder --dir",
10    "dist": "electron-builder"
11  },
12  "build": {
13    "productName": "Password Management System"
14  },
15  "repository": {
16    "type": "git",
17    "url": "git+https://github.com/xtrp/JSON-Password-Manager.git"
18  },
19  "keywords": [
20    "Password",
21    "Management",
22    "System"
23  ],
24  "Reference": "Gabriel Romualdo <xtrp@xtrp.io>",
25  "license": "MIT",
26  "bugs": {
27    "url": "https://github.com/xtrp/JSON-Password-Manager/issues"
28  },
29  "homepage": "https://github.com/xtrp/JSON-Password-Manager#readme",
30  "devDependencies": {
31    "electron": "^11.5.0",
32    "electron-builder": "^22.7.0"
33  },
34  "dependencies": {
35    "encrypt-with-password": "^1.0.0",
36    "lodash": "^4.17.21",
37    "lodash.clonedeep": "^4.5.0",
38    "monaco-editor": "^0.20.0",
39    "monaco-json": "^2.9.0",
40    "monaco-languages": "^1.10.0",
41    "uuid": "^3.4.0"
42  }
43 }
```

### Results

valid JSON

## API DESCRIPTIONS

### 1. User

#### Generate Password

URL	<code>https:// &lt;Host-Name-of-PMP-Server OR IP address&gt; :&lt;Port&gt;/restapi/json/v1/passwords/generate</code>
Header	<code>AUTHTOKEN=&lt;&lt;Authtoken_generated_from_PMP&gt;&gt;</code>
HTTP Method	GET
Input Data	<code>INPUT_DATA={ "operation" : { "Details" : { "POLICY" : "Strong" } } }</code>
Sample Output	<pre>{   "operation": {     "name": "GENERATE PASSWORD",     "result": {       "status": "Success",       "message": "Password generated successfully."     },     "Details": {       "PASSWORD": "u%mdh7gfN"     }   } }</pre>

## Batch Generate Password

URL	https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/accounts/passwordaccessrequests
Header	AUTHTOKEN=<<Authtoken_generated_from_PMP>>
HTTP Method	GET
Input Data	None
Sample Request	curl -k -H "AUTHTOKEN:<<Authtoken_generated_from_PMP>>" https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/accounts/passwordaccessrequests
Sample Output	<pre>{   "operation":{     "name":"GET_PASSWORDREQUEST"     "result":{       "status":"Success"       "message" : "Password Request fetched successfully"     }     "Details": {       "REQUESTER USERID":"2"       "REQUESTED BY":"guest"       "REQUESTED BY FULLNAME" : "Guest guest"       "PASSWORDREQUESTLIST" : [         {           "ACCOUNT ID" : "1"           "ACCOUNT NAME" : "ACCOUNT1"           "RESOURCE ID":"1"           "RESOURCE NAME":"apt-server1"           "PASSWD ID" : "1"           "STATUS":""           "REQUESTED TIME":"Nov 27           "REASON" : "For connecting the machine and update the PMP server".         }       ]     }   }</pre>

	<pre>"ACCOUNT ID" : "2" "ACCOUNT NAME" : "ACCOUNT2" "RESOURCE ID": "2" "RESOURCE NAME": "apt-server2" "PASSWD ID" : "2" "STATUS": "" "REQUESTED TIME": "Nov 28 "REASON" : "For connecting the machine and update the PMP server". }}}}</pre>	
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## Change Password

URL	https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/resources/<Resource ID>/accounts/<Account ID>/password
Header	AUTHTOKEN=<<Authtoken_generated_from_PMP>>
HTTP Method	PUT
Input Data	<pre>INPUT_DATA={   "operation":{     "Details":{       "NEWPASSWORD":"Test@12345\$",       "RESETTYPE":"LOCAL",       "REASON":"Password Expired",       "TICKETID":"7"     }   } }</pre>
Sample Request	<pre>curl -X PUT -k -H "AUTHTOKEN&lt;&lt;Authtoken_generated_from_PMP&gt;&gt;" https://&lt;Host-Name-of-PMP-Server OR IP address&gt;: &lt;Port&gt;/restapi/json/v1/resources/2/accounts/2/password --data-urlencode INPUT_DATA={"operation":{"Details": {"NEWPASSWORD":"Test12345\$","RESETTYPE":"LOCAL","REASON":"test","TICKETID":"7"}}}</pre>
Sample Response	<pre>{   "operation":{ "name":"CHANGE PASSWORD",   "result":{     "status":"Success",     "message":"Password changed successfully"   } }</pre>

## Delete An Account Under Specific Resources (Account and Password)

URL	https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/resources/<Resource ID>/accounts/<Account ID>/
Header	AUTHTOKEN=<<Authtoken_generated_from_PMP>>
HTTP Method	DELETE
Sample Request	curl -X DELETE -k -H "AUTHTOKEN:<<Authtoken_generated_from_PMP>>" -H "Content-Type: text/json" https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/resources/1/accounts/1
Sample Response	{ "operation":{ "name":"DELETE ACCOUNT", "result":{"status":"Success","message":"Account Test123 deleted successfully."}}}



## Edit An Account Under Specific Resources (Account and Password)

URL	https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/resources/<Resource ID>/accounts/<Account ID>/
Header	AUTHTOKEN=<<Authtoken_generated_from_PMP>>
HTTP Method	PUT
Sample Input	{ "operation": { "Details": { "ACCOUNTNAME": "Test account", "ACCOUNTPASSWORDPOLICY": "Strong", "NOTES": "Created for quality assurance", "ACCOUNTCUSTOMFIELD": [ { "CUSTOMLABEL": "Secure Account", "CUSTOMVALUE": "YES" } ] } } }
Sample Request	curl -X PUT -k -H "AUTHTOKEN:<<Authtoken_generated_from_PMP>>" -H "Content-Type: text/json" https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/resources/1/accounts/1 --data-urlencode "INPUT_DATA={ \"operation\": { \"Details\": { \"ACCOUNTNAME\" : \"Test account\", \"ACCOUNTPASSWORDPOLICY\": \"Strong\", \"NOTES\": \"Created for quality assurance\", \"ACCOUNTCUSTOMFIELD\" : [ { \"CUSTOMLABEL\" : \"Secure Account\", \"CUSTOMVALUE\" : \"YES\" } ] } } }"
Sample Response	{ "operation": { "name": "EDIT ACCOUNT", "result": { "status": "Success", "message": "Account Test account modified successfully" } } }

## 2. SA

### Lock User (Block)

URL	https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/user/lock?USERNAME=(username)
Header	<div>AUTHTOKEN=&lt;&lt;Authtoken_generated_from_PMP&gt;&gt;</div> <div>orgName= &lt;&lt;org display name&gt;&gt;</div>
HTTP Method	PUT
Input Data	None
Sample Request	https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/user/lock?USERNAME=apiuser
Sample Response	{ "operation": { "name": "LOCK USER", "result": { "status": "Success", "message": "User account apiuser locked successfully." } } }

## Unlock User (Unblock)

URL	<code>https://&lt;Host-Name-of-PMP-Server OR IP address&gt;:&lt;Port&gt;/restapi/json/v1/user/unlock?USERNAME=(username)</code>
Header	<code>AUTHTOKEN=&lt;&lt;Authtoken_generated_from_PMP&gt;&gt;</code> <code>orgName= &lt;&lt;org display name&gt;&gt;</code>
HTTP Method	PUT
Input Data	None
Sample Request	<code>https://&lt;Host-Name-of-PMP-Server OR IP address&gt;:&lt;Port&gt;/restapi/json/v1/user/unlock?USERNAME=apiuser</code>
Sample Response	<code>{"operation":{"name":"UNLOCK USER","result":{"status":"Success","message":"User account apiuser unlocked successfully. "}}}</code>

Reset Two-Factor Authentication

URL	https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/user/resetMFA?USERNAME=<username>
Header	AUTHTOKEN=<<Authtoken_generated_from_PMP>>
HTTP Method	PUT
Parameter	USERNAME=<username>
Sample Request	https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/user/resetMFA?USERNAME=<username>
Sample Response	<pre>{   "operation":{     "result":{       "message": "Two Factor Authentication reset successfully",       "status": "Success"     },     "name": "Reset MFA"   } }</pre>

## Edit Resources (Edit Password Policy)

URL	<code>https://server-name:port/restapi/json/v1/resources/{RESOURCEID}</code>
Header	<code>AUTHTOKEN=&lt;&lt;Authtoken_generated_from_PMP&gt;&gt;</code>
HTTP Method	PUT
Sample Input	<pre>{   "operation": {     "Details": {       "RESOURCENAME": "Test",       "LOCATION": "4th floor",       "RESOURCEURL": "http://test",       "RESOURCEPASSWORDPOLICY": "Strong",       "DEPARTMENT": "Test",       "RESOURCEDESCRIPTION": "Created for quality assurance",       "RESOURCETYPE": "Windows",       "RESOURCECUSTOMFIELD": [         {           "CUSTOMLABEL": "Secure Resource",           "CUSTOMVALUE": "YES"         }       ]     }   } }</pre>
Sample Request	<pre>curl -X PUT -k -H "AUTHTOKEN:&lt;&lt;Authtoken_generated_from_PMP&gt;&gt;" https://&lt;Host-Name-of-PMP-Server OR IP address&gt;: &lt;Port&gt;/restapi/json/v1/resources/1 -data-urlencode "INPUT_DATA={\"operation\":{\"Details\": [\"RESOURCENAME\": \"Test\", \"LOCATION\": \"4th floor\", \"RESOURCEURL\": \"http://test\", \"RESOURCEPASSWORDPOLICY\": \"Strong\", \"DEPAR TMENT\": \"Test\", \"RESOURCEDESCRIPTION\": \"Created for quality assurance\", \"RESOURCECUSTOMFIELD\": [{\"CUSTOMLABEL\": \"Secure Resource\", \"CUSTOMVALUE\": \"YES\" } ] ] } }"</pre>
Sample Response	<pre>{ "operation": { "name": "EDIT RESOURCE", "result": { "status": "Success", "message": "Resource Test modified successfully." } } }</pre>

### Approve A Password Requested (Updated Account Validated)

URL	https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/accounts/{accountid}/requester/{requesterid}/approve
Header	AUTHTOKEN=<<Authtoken_generated_from_PMP>>
HTTP Method	POST
Input Data	None
Sample Request	curl -X POST -k -H "AUTHTOKEN:<<Authtoken_generated_from_PMP>>" -H "Content-Type: text/json" https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/accounts/7/requester/34/approve
Sample Response	{ "operation": { "name": "ADMIN_REQUEST_APPROVE" "result": { "status": "Success" "message": "Password Approved successfully" } } }

### 3. LA

#### Get the Password of An Account that is Part of A Resource (Map Password)

URL	https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/resources/<Resource ID>/accounts/<Account ID>/password
Header	AUTHTOKEN=<<Authtoken_generated_from_PMP>>
HTTP Method	GET
Input Data	INPUT_DATA={"operation":{"Details":{"REASON":"Need the password to Login Windows Server","TICKETID":"7"}}}
Sample Request	curl -k -H "AUTHTOKEN:<<Authtoken_generated_from_PMP>>" https://<Host-Name-of-PMP-Server OR IP address>:<Port>/restapi/json/v1/resources/303/accounts/307/password

	<pre>curl -X GET -k -H "Content-Type: text/json" -H "AUTHTOKEN:&lt;&lt;Authtoken_generated_from_PMP&gt;&gt;" https://&lt;Host-Name-of-PMP-Server OR IP address&gt;:&lt;Port&gt;/restapi/json/v1/resources/2/accounts/2/password --data-urlencode INPUT_DATA={"operation":{"Details":{"REASON":"Need the password to Login Windows Server"}}}</pre>
Sample Response	<pre>{   "operation":{     "name":"GET PASSWORD",     "result":{       "status": "Success",       "message":"Password fetched successfully"     },     "Details":{       "PASSWORD":"fqxdB7ded@4"     }   } }</pre>

Fetch All SSH Keys (Retrieve Access Token)

URL	https://<Host-Name-of-PMP-Server OR IP address>:<Port>/api/pki/restapi/getAllSSHKeys
Header	AUTHTOKEN=<<Authtoken_generated_from_PMP>>
HTTP Method	GET
Input Data	None
Sample Request	https://<Host-Name-of-PMP-ServerORIPaddress>:<Port>/api/pki/restapi/getAllSSHKeys
Sample Response	{ "name": "GetAllSSHKeys", "result": [ { "status": "Success", "message": "All SSH Keys fetched successfully" }, { "totalRows": 1, "details": [ { "KeyName": "testkey", "KeyType": "ssh-rsa", "KeyLength": "2048", "FingerPrint": "SHA256:v28/AIRYrpBKjAp4JoTRphLOkf dVb1ummVcyFH5fC5f", "isPassphraseAvailable": false, "CreatedBy": "mm", "CreationTime": "Today" } ] } ] }



## **REFERENCES**

- [https://www.researchgate.net/figure/Architectural-framework-for-the-proposed-Password-Manager-System\\_fig1\\_283121397](https://www.researchgate.net/figure/Architectural-framework-for-the-proposed-Password-Manager-System_fig1_283121397)
- <https://www.freeprojectz.com/uml-diagram/login-management-system-sequence-diagram>
- <https://www.geeksforgeeks.org/state-diagram-for-online-banking-system/>
- <https://github.com/coderpass/CoderPass/commit/78668c1cbd663a721c0a837beb98dfe4f59f78b7>
- <https://jsonlint.com/>
- <https://www.manageengine.com/products/passwordmanagerpro/help/restapi.html#getresource>