API Specification

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This document defines the technical specification for the integration between Smart and Different Hospital Systems.

INTRODUCTION

The Hospital Management Information System (HMIS) is the primary system used for purposes of managing the hospital processes including patient invoicing and various other aspects of patient servicing.

The Smart solution is an automated medical scheme management solution that delivers guaranteed member identification at the point of service, electronic management of member listing and member benefits as well the electronic capture and delivery of claims information for healthcare services rendered at point of service.

This document is an integration specification of the HMIS, and the Smart system deployed at your facility. This involves exchange of data between the two systems for the purposes of enhanced efficiency in operations and value addition.

Objectives of HMIS to Smart System Integration

The integration of the Smart system to the HMIS realizes the following: -

1. Seamless exchange of data between the hospital system and the Smart system for increased efficiency.
2. Automated validation of the patient through biometrics on the Smart system which assures that the correct patient is being treated on the hospital system since the same validated patient data is shared between the two systems.
3. Reduced manual data entry on patient records for registration and billing as this is picked directly from the patient's smart card which already has the patient information from the medical insurer.
4. Quicker servicing and reduced patient turnaround time through elimination of double capture of the patient claim information in both the HMIS and Smart systems as happens in nonintegrated modes.
5. Reduced risk of over servicing since the member balance is availed to the HMIS which through the integration monitors the limit passed to it against the services being charged. This reduces the risk of rejected claims by the hospital.
6. Enhanced Smart system compliance since the integrated HMIS system prompts the attendant to use the smart card for patients from smart card schemes whichare marked as such in the hospital system.
7. The same invoice/claim as captured on the Hospital system is also transferred to the Smart system for onward online transmission to the medical insurer through the Smart system.
8. Assured hospital revenue since the integration ensures that the hospital staff processes the scheme patients on Smart through the agreed rules of running the smart card as stipulated by the medical scheme administrator.
9. Online invoice tracking.

This document defines the technical specification for the Integration between Smart and Hospital Management Information System (HMIS).

The aim for this project is aimed at improving the Integration process Provider process and the support that goes around the Provider Integrations.

API CREDENTIALS

The API has been designed to use OAUTH2 (Bearer) token, below is the process of generating the token.

- Generate OAUTH2 (Bearer)Token

Generate bearer OAUTH2 access token using client_id and client secret, username and password provided using /ap/oauth/token URL. Sample postman json attached.

SAMPLE POSTMAN JSON_PROVIDER_API.

Example Value

End Point: https://data.smartapplicationsgroup.com/providerapi-dev/oauth/token

Validations and Validation Responses

The validation messages have been categorized into the following categories

1. Success messages: A successful fetching or submitting of a claim, member benefits and any other related details, the success code shall be Code 200. This is derived from the http codes. . e.g.
    a. Member benefits posted successfully – response code is 200.
    b. Diagnosis Captured successfully – response code is 200.
2. Warning Messages: These are the notifications messages and codes that shall be returned incase there is a warning/a notification to a user. The notification code shall be 200.0 i.e. 200 with a decimal.
3. Error messages: Incase there is an error in an operation during the transactions, the error codes shall start with 400.1000,400.2000.. 400 is a default prefix of the error code, it is borrowed from http codes.
    a. Claim error : shall have an error warning with error code 400.1000 to 400.1999.
    b. Error Code Starting from 400.2000…. will be an error for another operation e.g. for Preauthorization.

NB: The base endpoints in this document are for smart testing environment. On production the https://data.smartapplicationsgroup.com/providerapi-dev will change to Smart server IP hosted at the Medical Provider.

Process Flow

This will be achieved through two methods, and in the following models,

Models

i. Visit Controller – It is for linking the HMIS visit ID and Smart sessions ID.
ii. Member Controller - These are member details including the benefit details.
iii. Benefits Controller – These are the benefits allocated to a member(patient) by the insurer.
iv. Claim-Controller – This contains claims details.
v. Claim Status - For confirming the status after the authentication has happened on smarlink.
vi. End session Controller -These enables HMIS to end an active session.
vii. Clinical record – This contains clinical information like diagnosis.

Visit-Controller

The Visit controller is responsible for managing member visit session in the system, Once the Smart System Posts data in the API for the Hospital system to fetch, the session is created but remains in a pending state until a visit number is generated by the Hospital system. The Hospital system then pushes the visit number to the API to set the session to active state.

Sessions are of two different types

i. **Outpatient Type:** The session remains open until 24hours and then it closes/ends.
ii. **Inpatient Type:** The session remains open until when the patient is discharged.

End Points

1. **GET:** **/api/visit** - This endpoint is responsible for fetching a visit

Parameters

Name	Description
patientNumber * **string** *(query)*	patientNumber

Name	Description
sessionStatus * **string** *(query)*	sessionStatus *Available values* : Pending, Active, Closed *Default value* : Pending

Example Value:
https://data.smartapplicationsgroup.com/providerapidev/api/visit?patientNumber=111&sessionStatus=PENDING

2. PUT **/api/visit/{id}/visit-number/{visitNumber}** : The endpoint is responsible for updating the session into active state.

Parameters

Name	Description
id * **integer**($int64) *(path)*	Session Id fetched from the GET session endpoint
visitNumber * **string** *(path)*	visitNumber generated by the HMIS

Responses

Code	Description
200	***OK*** • **Example Value** • Model {}
201	***Created***
401	***Unauthorized***
403	***Forbidden***

Code	Description
404	*Not Found*

401	*Unauthorized*
403	*Forbidden*
404	*Not Found*

Example Value:
https://data.smartapplicationsgroup.com/providerapi-dev/api/visit/101/visit-number/1

Member/Patient Information

1. **GET:** This endpoint allows the hospital Smart System to fetch the member cover details and the Member BIO data from the API, to enable for processing of an invoice during the service through the Patient's Visit to the hospital. The details are submitted to the API by the Smartsystem.

Get Endpoint: /api/member

Parameters

Name	Description
patientNumber * **string** *(query)*	patientNumber
sessionID * **string** *(query)*	sessionid

Responses

Code	Description

Code	Description
200	*OK* • Example Value • Model {}
401	*Unauthorized*
403	*Forbidden*
404	*Not Found*

Example Value:
https://data.smartapplicationsgroup.com/providerapi-dev/api/member?patientNumber=111&sessionId=486


```
{
 "admit_id": "string",
 "benefits": [
  {
   "amount": 0,
   "claimable": true,
   "groups": [
    {
     "code": "string",
     "name": "string"
    }
   ],
   "pool_desc": "string",
```

```
    "pool_nr": "string",
    "sp_id": 0
  }
],
"card_serial_number": "string",
"co_pay_amount": 0,
"global_id": "string",
"has_copay": true,
"medicalaid_code": "string",
"medicalaid_expiry": "yyyy-MM-dd",
"medicalaid_name": "string",
"medicalaid_number": "string",
"medicalaid_plan": "string",
"medicalaid_regdate": "yyyy-MM-dd",
"medicalaid_scheme_code": "string",
"medicalaid_scheme_name": "string",
"member_name": "string",
"patient_dob": "yyyy-MM-dd",
"patient_forenames": "string",
"patient_gender": "string",
"patient_number": "string",
"patient_surname": "string",
"policy_country": "string",
```

```
  "policy_currency": "string",
  "policy_id": "string",
  "session_type": "Outpatient",
  "vip_message": "string"
}
```


Benefits Controller/Member Benefits

1. **GET:** The get benefits endpoint enables the Hospital System to

   Endpoint: /api/benefits :- for fetching Member Benefit

Parameters

Name	Description
patientNumber **string** *(query)*	patientNumber
poolNumber **string** *(query)*	poolNumber
sessionId **integer**($int64) *(query)*	sessionId
spID **string** *(query)*	spID

Responses

Code	Description
200	***OK*** **Example Value** | Model

Code	Description	

	<pre>{
	"amount": 0,
	"claimable":
	true, "groups":
	[
	{
	"code": "string",
	"name": "string"
	}
	],
	"pool_desc":
	"string", "pool_nr":
	"string", "sp_id": 0
	
	}</pre>	

201	*Created*	
401	*Unauthorized*	
403	*Forbidden*	
404	*Not Found*	

Example:
https://data.smartapplicationsgroup.com/providerapi-dev/api/benefits?patientNumber=111&sessionId=486


```
[
 {
  "amount": 0,
  "claimable": true,
  "groups": [
   {
    "code": "string",
    "name": "string"
   }
```

```
    ],
    "pool_desc": "string",
    "pool_nr": "string",
    "sp_id": 0
  }
]
```


Claim Controller

GET: **/api/claims** :The end point enables Smart system to get results/submitted bill from the hospital system.

1. POST: This enables the hospital system to submit the bill including diagnosis,invoices and Invoice lines (breakdown/list of services),preauthorization and admission details

Parameters

Name	Description
patientNumber **string** *(query)*	patientNumber
claimData *	claimData
sessionId **integer**($int64) *(query)*	sessionId
spID **string** *(query)*	spID

Example:
https://data.smartapplicationsgroup.com/ providerapi-dev /claims?patientNumber=11111&sessionId=4

```
{
        "claim_code": "MMCC00030",
        "payer_code": "SMP",
        "payer_name": "SAMPLE PAYER NAME",
        "medicalaid_code":  "string", "amount":
        2630,
        "gross_amount": 2630,
        "batch_number": "batch4",
        "dispatch_date": "2018-01-05",
        "patient_number": "42087",
        "patient_name": "SAMPLE NAME",
        "location_code": "BURUBURU",
        "location_name": "Buruburu",
        "scheme_code": "SCH2018",
        "scheme_name": "SAMPLE SCHEME",
        "member_number": "222/04",
        "visit_number": "11244323",
        "visit_start": "2018-01-03T00:00:00Z",
        "visit_end": "2018-01-03T00:00:00Z",
        "currency": "KES",
        "doctor_name": "DR. Omondi",
        "sp_id": 0,
        "diagnosis": [{
                        "code": "string",
                        "coding_standard": "string",
                        "is_added_with_claim": true,
                        "name": "string",
                        "primary": true
                },
                {
                        "code": "string",
                        "coding_standard": "string",
                        "is_added_with_claim": true,
                        "name": "string",
                        "primary": true
                }
        ],
          "pre_authorization": [{
                   "code": "P150",
                "amount": 5000,
                "authorized_by": "Esther",
                "message": "Authorized up to 5000 by Esther"
        }],
        "admission": [{
                "additional_info": "string",
                "admission_date": "string",
                "admission_number": "string",
                "discharge_date": "string",
                "discharge_summary": "string"
        }],
        "invoices": [{
                "amount": 0,
                "gross_amount": 0,
```

```
                        "invoice_date": "string",
                        "invoice_number": "string",
                        "invoice_ref_number": "string",
                        "lines": [{
                                        "additional_info": "string",
                                        "amount": 0,
                                        "charge_date": "string",
                                        "charge_time": "string",
                                        "item_code": "string",
                                        "item_name": "string",
                                        "pre_authorization_code": "string",
                                        "quantity": 0,
                                        "service_group": "string",
                                        "unit_price": 0
                                },
                                {
                                        "additional_info": "string",
                                        "amount": 0,
                                        "charge_date": "string",
                                        "charge_time": "string",
                                        "item_code": "string",
                                        "item_name": "string",
                                        "pre_authorization_code": "string",
                                        "quantity": 0,
                                        "service_group": "string",
                                        "unit_price": 0
                                }
                        ],
                        "payment_modifiers": [{
                                        "type": "ROUNDED-OFF",
                                        "amount": 0.74,
                                        "reference_number": "string"
                                },
                                {
                                        "type": "NHIF",
                                        "amount": 2000,
                                        "reference_number": "string"
                                }
                        ],
                        "pool_number": "string",
                        "service_type": "string"
                }]
}
```


Responses

Code	Description
200	***OK***

- **Example Value**

Code	Description
	• Model {}
201	*Created*
401	*Unauthorized*
403	*Forbidden*
404	*Not Found*

2. GET: / claim-status?invoiceNumber= &visitNumber=- Check Claims Status

Parameters

Name	Description
invoiceNumber * **integer**($int64) *(query)* ***visitNumber****	invoiceNumber visitNumber
status **string** *(query)*	Status *Available values* : Pending, Cancelled, Billed *Default value* : Billed

Responses

Code	Description
200	*OK* • Example Value • Model
201	*Created*
401	*Unauthorized*

Code	Description
403	*Forbidden*
404	*Not Found*

Types of Payment modifiers:

Type 0 = Cash claim (claims more than pool amount)

Type 1 = Copay Fixed amount charged to patient

Type 2 = Copay % of claim amount charged to patient

Type 3 = Tier Cash

Type 5 = NHIF

Type 6 = Discount

End/ Close session

PUT: **/** /api/session/{id}/session number/{sessionNumber}**:** This end point will enable the HMIS to end an active session, the cashier will call the end point once a claim has successfully been retrieved and billed on smart. The cashier can then end the session, then forward the card again to start another new session.

https://data.smartapplicationsgroup.com/providerapi-dev/api/visit/8689/close-session

Parameters

Name	Description
id * **integer**($int64) *(path)*	Session Id fetched from the GET session endpoint

SBB Rules Controller

1. GET: The Get Items endpoint is responsible for availing the serviceable Items to the Hospital system. The endpoint also avails the Rules set on a member insurance cover, some of the rules that are exposed are include Preauthorization rules, Exclusion rules, Price setting rules, …… etc.

Parameters

Name	Description
medicalaidCode **string** *(query)*	medicalaidCode
medicalaidNumber **string** *(query)*	medicalaidNumber
sessionId*	Session id
patientNumber*	Patient file number
providerItemCode * **string** *(query)*	providerItemCode

Response

Code	Description
200	*OK*

Example Value | Model


```
{
  "code": "string",
  "content": [
    {
      "excluded": "string",
      "exclusion_id": 0,
      "exclusion_level": 0,
      "exclusion_rule_code": "string",
      "exclusion_rule_level": 0,
      "gid": 0,
      "group_code": "string",
      "group_name": "string",
      "is_map_group": 0,
      "is_map_service": 0,
      "item_ranking": "string",
      "nhif_amount": 0,
      "nhif_id": 0,
      "nhif_level": 0,
      "nhif_rule_code": "string",
      "nhif_rule_level": 0,
      "parent_group_code": "string",
      "pg_id": 0,
```

```
    "preauth_amount": 0,
    "preauth_id": 0,
    "preauth_level": 0,
    "preauth_rule_code": "string",
    "preauth_rule_level": 0,
    "price_amount": 0,
    "price_id": 0,
    "price_level": 0,
    "price_rule_code": "string",
    "price_rule_level": 0,
    "prov_group_code": "string",
    "prov_group_name": "string",
    "prov_service_code": "string",
    "prov_service_name": "string",
    "service_code": "string",
    "service_name":  "string",
    "sid": 0
  }
],
"message": "string",
"page_details": {
  "page": 0,
  "per_page": 0,
```

```
  "report_name": "string",
  "report_period": "string",
  "total_elements": 0,
  "total_page": 0
 }
}
```


401 *Unauthorized*

403 *Forbidden*

404 *Not Found*

Clinical record

1. POST : /api/diagnosis: The endpoint is responsible for Posting the patient's diagnosis from the Hospital System.

Parameters

Name	Description
clinicalData * *(body)*	clinicalData

Example: https://data.smartapplicationsgroup.com/providerapi-dev/diagnosis?patientNumber=111&visit_number=40


```
{
                    "diagnosis": [
                    {
                      "code": "string",
                      "coding_standard": "string",
                      "is_added_with_claim": true,
```

```
                    "name": "string",
                    "primary": true
                  }
            ],
            "member_number": "string",
            "patient_number": "string",
            "preauth_request_id": "string",
            "visit_number": "string",
            "invoice_date": "YYYY-MM-dd",
            "invoice_number":"string"
          }
```


Responses

Code	Description
200	***OK*** **Example Value** | Model {}
201	***Created***
401	***Unauthorized***
403	***Forbidden***
404	***Not Found***

2. POST : /api/requests : This is the endpoint responsible for submitting clinical requests.

Example


```
{
      "prescription": [
      {
        "amount": 0,
        "dosage": "string",
        "duration": "string",
```

```
            "frequency": "string",
            "item_code": "string",
            "item_name": "string",
            "price": 0,
            "quantity": 0,
            "route": "string"
          }
    ],

    "laboratory": [
          {
            "amount": 0,
            "item_code": "string",
            "item_name": "string",
            "price": 0,
            "quantity": 0
          }
    ],

     "radiology": [
          {
            "amount": 0,
            "item_code": "string",
            "item_name": "string",
            "price": 0,
            "quantity": 0
          }
    ],
     "procedure": [
          {
            "amount": 0,
            "item_code": "string",
            "item_name": "string",
            "price": 0,
            "quantity": 0
          }
    ],
     "other": [
          {
            "request_type":"string"
            "amount": 0,
            "item_code": "string",
            "item_name": "string",
            "price": 0,
            "quantity": 0
          }
    ],

            "member_number": "string",
            "patient_number": "string",
```

```
                "preauth_request_id": "string",
                "visit_number": "string"
        }
```

3. POST : /api/interim-claim : Responsible for submitting interim bills.

```
{
        everything as final claim with no validations
        }
```

4. POST : /api/admission: Responsible for submitting admission details

```
{
                "admission_number": "string",
                "visit_number": "string",
                "patient_number": "string",
                "preauth_request_id": "string",
                "admission_type": "REFFERRAL | INHOUSE",
                "admission_date": "string",
                "admitting_doctor": "name"
                "admitting_doctor_type": "PRIVATE | RESIDENT",
                "ward_name":"string",
                "ward_number": "string",
                "bed_type":"string",
                "bed_number":"string",
                "inpatient_number":"string",
                "admission_notes": "string",
                "additional_info": "string"
        }
```

5. POST : /api/discharge: Responsible for submitting discharge details

```
{
        "admission_number":"string",
        "patient_number":"string",
        "discharge_date":"YYYY-MM-dd",
        "discharging_doctor":"name",
        "discharge_summary":""
        }
```

Response

```
{
"code": "string",
"message": "string",
"response_type":"SUCCESS | WARNING | ERROR",
"content":"OBJECT | ARRAY",
"object_type": "string"
}
```

DATA EXCHANGE PROCESSES FLOW

i. Definition of Schemes using the Smart system at the provider

On the schemes definition module on the HMIS, a provision will have to be added to indicate whether a credit scheme/corporate is using the Smart system as the mode of identification and billing. This is used to initiate the integrated smart card billing.

This can be carried out through provision of a check box/radio button to indicate this on the scheme definition module as shown below:

CLIENT NAME	SCHEME NAME	STATUS	SMART STATUS
UAP Insurance	Smart Applications International	☐	☐
Kenya Power	Kenya Power	☐	☐
AON Insurance Brokers	G4S Securities	☐	x

Once this is configured for a scheme, the HMIS applies and enforces the Smart data exchange process for patient registration and billing for all patients who are selected as being under this scheme.

The function of selecting this checkbox to configure a scheme to follow the Smart process is hereby referred to as **scheme tagging**.

ii. Data Exchange at Initiation of Patient Bill

The member information is read from the card through the SmartLink system which is installed at the medical service provider.
Once the card is read, the Smart system which will be configured in integrated mode will provide a 'Forward' button for the user to post the card details to the Smart provider API to initiate the transaction.

The HMIS user will create a visit for the patient. HMIS will introduce a button for fetching Smart session ID fetch (/api/visit?patientNumber=11111&sessionStatus=Pending), another button for linking the Smart session ID with the hospital visit ID (/api/visit/4/visit-number/40).

On the HMIS billing screen, there will be a button for fetching smart card balance/member information (/api/member?patient_number=11111 or /api/benefits?patientNumber=11111&sessionId=4). The member & benefit information is then picked up by the HMIS which will have noted that the scheme/corporate to whom the patient record is associated to is **tagged.** The HMIS should not allow the cashier/attendant to proceed with the bill, if the smart card has not been run and forwarded, instead it should request the cashier through a message to forward the patient's card details.

iii. Patient Bill generation by the HMIS

The HMIS should ensure that all entered charges should not exceed the available benefit amount fetched from Smartcard. However, if the patient is willing to pay cash for the exceeding amount then HMIS should be able to separate the amount to be paid by Insurance and cash by the patient.

After the user has entered all charges and generated the invoice on the HMIS, this should be posted to Smart as claim JSON fi le (api/claims?patientNumber=11111&sessionId=4). This is made possible by introducing a post to smart button in HMIS. The HMIS should include all payment modifiers like COPAY with type 1, NHIF with type 2.

The HMIS should check the saving status of the invoice from Smart when the user clicks on print invoice button (/api/claims/sl/{id}/status/{status}). If the invoice was saved successful on Smart, then it should allow the invoice to print. However, if the invoice was not saved successfully then the HMIS to alert the user to 'Please Retrieve from Smart' so that the cashier can finalize the process on Smart.

iv. Smart Billing

The Smart system should then read claim JSON file created by the HMIS when the user clicks on the Retrieve button.

Once the file is read by the Smart system, the user must finalize billing on the system before he/she can print the invoice.

If the claim is successfully billed on Smart, the successful save claim status will be sent to Smart provider API

Summary of the Integration Actions

1) The HMIS requirements

The programmer must: -

1) Understand and be able to read and generate JSON files.
2) Understand and be able to connect and interact with the Smart provider API
3) Create a configuration function to mark a credit scheme/corporate as using smart cards (scheme mapping)
4) Create 2 buttons for fetching Smart sessions ID and linking the Smart session id with HMIS visit ID.

5) Create a button for reading the benefit amount from the smart card for the HMIS to pick and populate the billing and registration screens.
6) Create a button to post the generated claim file in a JSON format to Smart provider API.
7) Create a loop to check whether the Smart save confirm status and only allow printing of the invoice after this.
8) Create relevant user messages to guide the attendant/HMIS users as he or she proceeds to bill a Smart patient e.g." Please read card" & "Please Retrieve from Smart"
9) Work with the Smart technical liaison in the development of relevant user training manuals for the integrated process

2) Smart requirements

The Smart technical liaison in the integration project must: -

1) Clearly study and understand the hospital billing processes in order to come up with process flows for which the two systems will be integrated.
2) Work with the HMIS programmer to facilitate all required materials.
3) Test every aspect of the integration from scheme configuration, exchange of data and confirmation of smart card billing
4) Develop relevant user training manuals for the integrated process in conjunction with the HMIS developer(s)
5) Work with the hospital IT and the HMIS developers in training the system users