

# ITU-T

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OF ITU

## Y.2246

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SERIES Y: GLOBAL INFORMATION  
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS,  
NEXT-GENERATION NETWORKS, INTERNET OF  
THINGS AND SMART CITIES

Next Generation Networks – Service aspects: Service  
capabilities and service architecture

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### **Smart farming education service based on u-learning environment**

Recommendation ITU-T Y.2246

# ITU-T Y-SERIES RECOMMENDATIONS

## GLOBAL INFORMATION INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS, NEXT-GENERATION NETWORKS, INTERNET OF THINGS AND SMART CITIES

### GLOBAL INFORMATION INFRASTRUCTURE

|                                           |             |
|-------------------------------------------|-------------|
| General                                   | Y.100–Y.199 |
| Services, applications and middleware     | Y.200–Y.299 |
| Network aspects                           | Y.300–Y.399 |
| Interfaces and protocols                  | Y.400–Y.499 |
| Numbering, addressing and naming          | Y.500–Y.599 |
| Operation, administration and maintenance | Y.600–Y.699 |
| Security                                  | Y.700–Y.799 |
| Performances                              | Y.800–Y.899 |

### INTERNET PROTOCOL ASPECTS

|                                                                    |               |
|--------------------------------------------------------------------|---------------|
| General                                                            | Y.1000–Y.1099 |
| Services and applications                                          | Y.1100–Y.1199 |
| Architecture, access, network capabilities and resource management | Y.1200–Y.1299 |
| Transport                                                          | Y.1300–Y.1399 |
| Interworking                                                       | Y.1400–Y.1499 |
| Quality of service and network performance                         | Y.1500–Y.1599 |
| Signalling                                                         | Y.1600–Y.1699 |
| Operation, administration and maintenance                          | Y.1700–Y.1799 |
| Charging                                                           | Y.1800–Y.1899 |
| IPTV over NGN                                                      | Y.1900–Y.1999 |

### NEXT GENERATION NETWORKS

|                                                                       |                      |
|-----------------------------------------------------------------------|----------------------|
| Frameworks and functional architecture models                         | Y.2000–Y.2099        |
| Quality of Service and performance                                    | Y.2100–Y.2199        |
| <b>Service aspects: Service capabilities and service architecture</b> | <b>Y.2200–Y.2249</b> |
| Service aspects: Interoperability of services and networks in NGN     | Y.2250–Y.2299        |
| Enhancements to NGN                                                   | Y.2300–Y.2399        |
| Network management                                                    | Y.2400–Y.2499        |
| Computing power networks                                              | Y.2500–Y.2599        |
| Packet-based Networks                                                 | Y.2600–Y.2699        |
| Security                                                              | Y.2700–Y.2799        |
| Generalized mobility                                                  | Y.2800–Y.2899        |
| Carrier grade open environment                                        | Y.2900–Y.2999        |

### FUTURE NETWORKS

### CLOUD COMPUTING

### BIG DATA

### QUANTUM KEY DISTRIBUTION NETWORKS

### INTERNET OF THINGS AND SMART CITIES AND COMMUNITIES

|                                                         |               |
|---------------------------------------------------------|---------------|
| General                                                 | Y.4000–Y.4049 |
| Definitions and terminologies                           | Y.4050–Y.4099 |
| Requirements and use cases                              | Y.4100–Y.4249 |
| Infrastructure, connectivity and networks               | Y.4250–Y.4399 |
| Frameworks, architectures and protocols                 | Y.4400–Y.4549 |
| Services, applications, computation and data processing | Y.4550–Y.4699 |
| Management, control and performance                     | Y.4700–Y.4799 |
| Identification and security                             | Y.4800–Y.4899 |
| Evaluation and assessment                               | Y.4900–Y.4999 |

For further details, please refer to the list of ITU-T Recommendations.

# Recommendation ITU-T Y.2246

## Smart farming education service based on u-learning environment

### Summary

Recommendation ITU-T Y.2246 provides a reference architecture and service requirements for smart farming education. It focuses on the farming education service about farming knowledge which includes farming technology, farming skills, farmers' experiences and their know-how, etc. The information related to farming knowledge will reflect current activities, farming products and the experience of farmers in the field. The core component of the automation process is the creation of a data store that will be a repository for this information. The farming sector will benefit immensely from the implementation of farming data in a farming contents repository which will serve as a knowledge base for the automation process. This Recommendation also discusses how this service may be used to develop a knowledge base intended to benefit those involved in the farming sector.

### History

| Edition | Recommendation | Approval   | Study Group | Unique ID*                                                                |
|---------|----------------|------------|-------------|---------------------------------------------------------------------------|
| 1.0     | ITU-T Y.2246   | 2021-09-13 | 13          | <a href="http://handle.itu.int/11.1002/1000/14758">11.1002/1000/14758</a> |

### Keywords

Content resource repository, education contents management function, farming education administration function, farming education service provider, information and communication technology (ICT), smart farming education service.

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\* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

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## Table of Contents

|    |                                                                                                                              | Page |
|----|------------------------------------------------------------------------------------------------------------------------------|------|
| 1  | Scope.....                                                                                                                   | 1    |
| 2  | References.....                                                                                                              | 1    |
| 3  | Definitions .....                                                                                                            | 1    |
|    | 3.1 Terms defined elsewhere .....                                                                                            | 1    |
|    | 3.2 Terms defined in this Recommendation.....                                                                                | 1    |
| 4  | Abbreviations and acronyms .....                                                                                             | 2    |
| 5  | Conventions .....                                                                                                            | 3    |
| 6  | Overview.....                                                                                                                | 3    |
| 7  | Service requirements of smart farming education service .....                                                                | 4    |
| 8  | Reference architecture of application model for smart farming education service .....                                        | 5    |
|    | 8.1 Farming education service provider (FESP) .....                                                                          | 5    |
| 9  | Smart farming education service scenario .....                                                                               | 7    |
| 10 | Network capabilities .....                                                                                                   | 8    |
| 11 | Security consideration .....                                                                                                 | 10   |
|    | Appendix I – Information flows for smart farming education service .....                                                     | 11   |
|    | I.1 General .....                                                                                                            | 11   |
|    | I.2 Service flows .....                                                                                                      | 11   |
|    | I.3 Information flows .....                                                                                                  | 13   |
|    | Appendix II – Example of FaaS configuration diagram .....                                                                    | 16   |
|    | II.1 FaaS .....                                                                                                              | 16   |
|    | Appendix III – An example of scenarios of the architecture on object tagging and<br>customization of smart uSDL objects..... | 17   |
|    | III.1 VO/CVO based description of learning object metadata in uSDL.....                                                      | 17   |
|    | Bibliography.....                                                                                                            | 18   |



# Recommendation ITU-T Y.2246

## Smart farming education service based on u-learning environment

### 1 Scope

This Recommendation provides the following:

- Service requirements for smart farming education services;
- Concepts of smart farming education service;
- Reference architecture for smart farming education service;
- Smart farming education service scenario;
- Security and network capabilities for smart farming education service.

### 2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T Y.2701] Recommendation ITU-T Y.2701 (2007), *Security requirements for NGN release 1*.

### 3 Definitions

#### 3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

**3.1.1 composite virtual object** [b-ITU-T Y.4452]: A collection of multiple VOs to abstract a service feature, operation or management function, to enable the mash-up and collaboration.

**3.1.2 service user** [b-ITU-T T.135]: A person, an organization or any intermediate entity using the services provided by a service provider.

**3.1.3 smart farming service provider** [b-ITU-T Y.4450]: The service role that provides the requested Smart Farming services, such as providing a portal or consulting based on data gathered from agricultural fields, to requesting users.

**3.1.4 virtual object** [b-ITU-T Y.4452]: A virtual representation of a real world object (e.g., sensor, device, task, process and information).

**3.1.5 ubiquitous self-directed learning** [b-ITU-T Y.2241]: A self-directed learning (SDL) process in a ubiquitous computing environment.

#### 3.2 Terms defined in this Recommendation

This Recommendation defines the following terms:

**3.2.1 beginner farmer:** Farmer who starts farming as a beginner.

**3.2.2 content resource repository:** Storage that stores objected content information related to smart farming education information.

**3.2.3 expert farmer:** Farmer who has expertise in farming with possessing overall know-how and knowledge of success and failure information.

**3.2.4 farmer:** A farmer is a person who is engaged in agriculture.

NOTE – Agriculture is the term used to refer to the science or practice of farming, growing of crops and rearing of animals.

**3.2.5 farm as a service:** An operation service that supports data collection and control management in a cloud environment that provides smart farm service through virtualization of agricultural resources, and an application service for farm operation, monitoring and control, data management, and device management.

**3.2.6 farming education service provider:** Provider that provides farming education services.

**3.2.7 learner:** Service user who receives farming education services, could be a beginner farmer or an expert farmer.

## 4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

|      |                                              |
|------|----------------------------------------------|
| AAA  | Authentication, Authorization and Accounting |
| AI   | Artificial Intelligence                      |
| CCFE | Content Composition Functional Entity        |
| COFE | Content Object Functional Entity             |
| CRR  | Content Resource Repository                  |
| CVO  | Composite Virtual Object                     |
| DRM  | Digital Rights Management                    |
| ECMF | Education Contents Management Function       |
| EIFE | External Interface Functional Entity         |
| EMFE | Education Management Functional Entity       |
| FaaS | Farm as a Service                            |
| FEAF | Farming Education Administration Function    |
| FESP | Farming Education Service Provider           |
| ICT  | Information and Communication Technology     |
| IoT  | Internet of Things                           |
| ML   | Machine Learning                             |
| PaaS | Platform as a Service                        |
| SCFE | Service Coordination Functional Entity       |
| SDL  | Self-Directed Learning                       |
| SNS  | Social Networking Service                    |
| uSDL | ubiquitous Self-Directed Learning            |
| VO   | Virtual Object                               |