WIGOS Metadata Standard

… Supporting adequate use of observations & rational network evolution

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ICG-WIGOS TT-WMD

WEATHER CLIMATE WATER
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World Meteorological Organization
Organisation météorologique mondiale

Outline

- Introduction
- WMDS Basics
- WMDS Advanced
- Summary

INTRODUCTION

What are metadata? Why are they essential?

Metadata = documentation describing data, context of observations

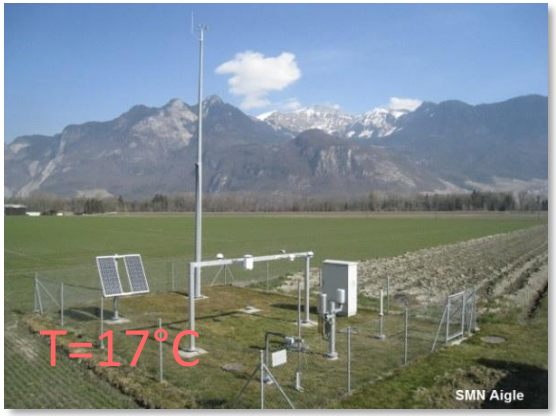
→ Observed variable

→ Location

→ Environment

→ Intended use

→ …



Essential data are exchanged globally, but metadata are not.

Even though metadata are needed to make *adequate* use of observations, they have not always been easily available to users.

Metadata for climate applications

"The details and history of local conditions, instruments, operating procedures, data processing algorithms and other factors pertinent to interpreting data (i.e. metadata) should be documented and treated with the same care as the data themselves."

GCOS Climate Monitoring Principle #3

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Objectives and Approach

Enable adequate use of meteorological and climatological observations for various application areas serving society.

Inform Members how to evolve their observing systems rationally, with a view to the needs of the global systems.

- Develop a common metadata standard to improve the documentation and exchange of information.
- Establish a web-based platform for the management, archival and exchange of such information world-wide.

Purposes of Metadata

- Describe products
- Support discovery, access, retrieval

→ Formalized using ISO19115 metadata standard

- Describe observations, stations
- Enable adequate use of observations
- Support rational evolution of observing systems

→Formalized using ISO19156
(includes ISO19115) metadata standard

WIGOS **M**eta**D**ata **S**tandard

WMDS BASICS

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Requirements

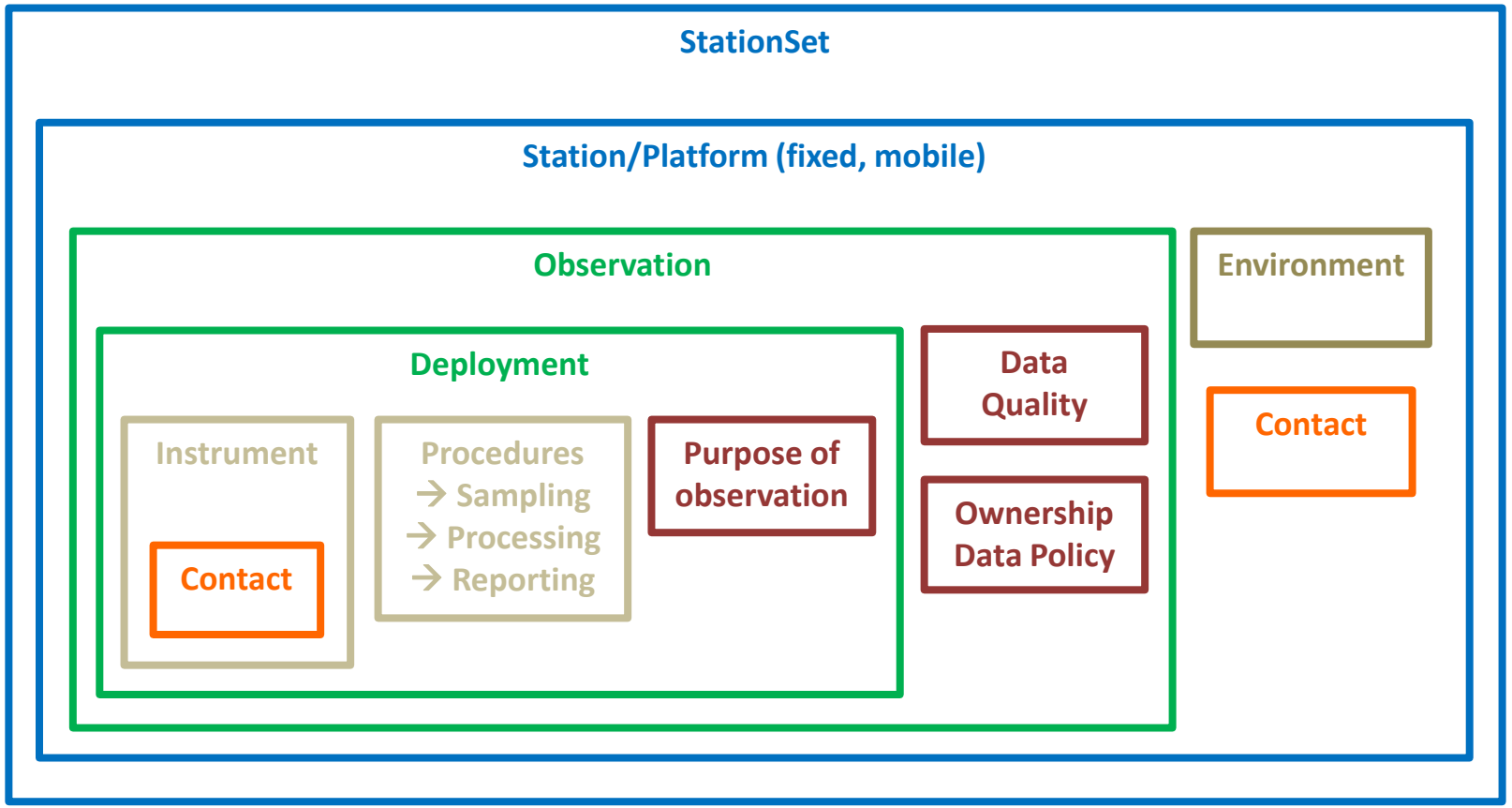
1. Enable adequate use of observations
2. Cover all types of observations
3. Cover all disciplines / application areas
4. Forward-looking but also respecting legacy
5. Acceptable to and applicable by all Members
6. Keep it simple, not too many items

… or, how to square the circle

10 WIGOS metadata categories

1. Observed variable
2. Purpose of observation
3. Station/platform
4. Environment
5. Instruments and method of observation
6. Sampling
7. Data processing and reporting
8. Data quality
9. Ownership and data policy
10. Contact

Hierarchy of WMD categories



OSCAR Observing Systems Capability Analysis and Review Tool

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WMDS ADVANCED

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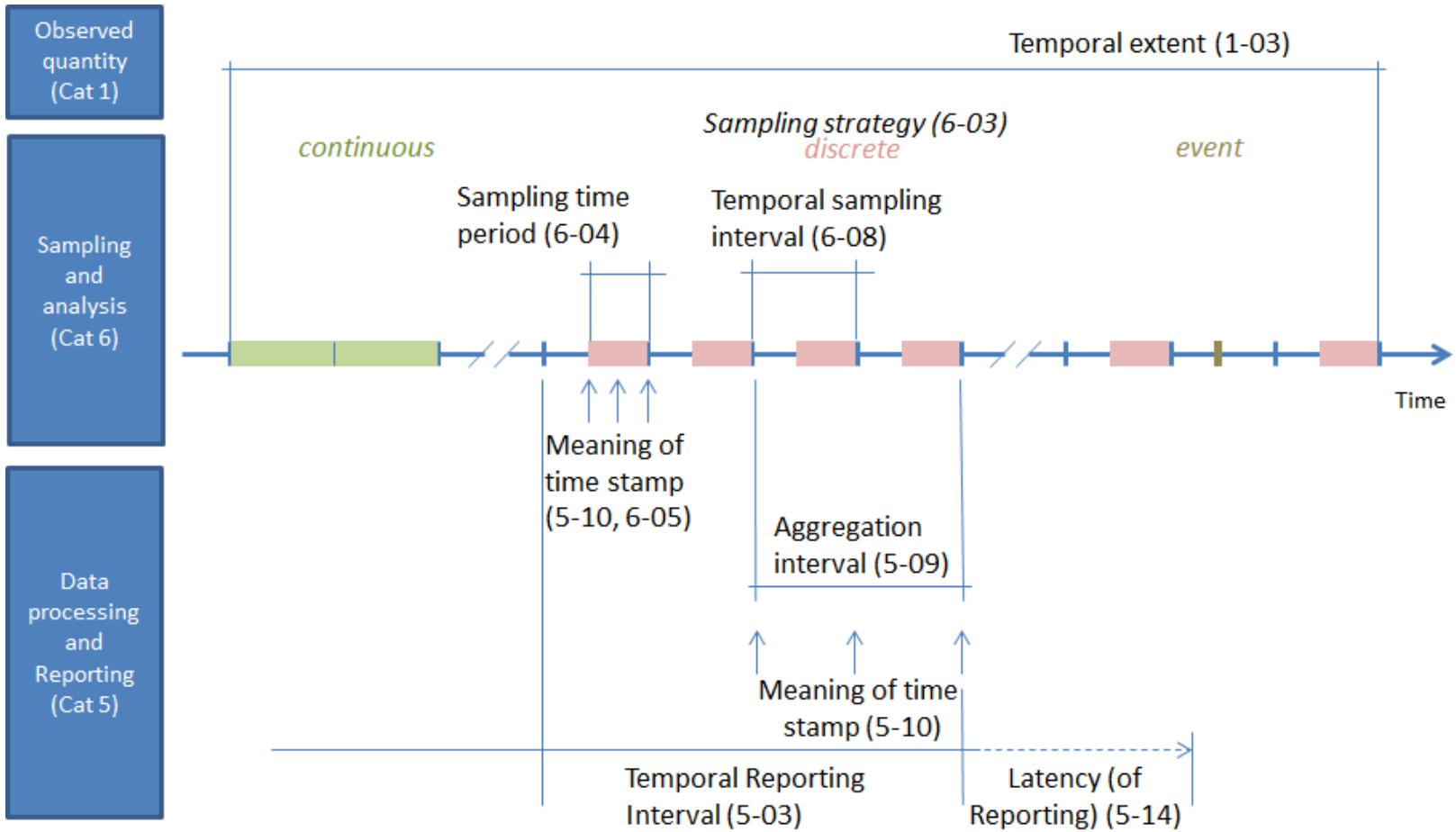
Concepts of Time in WMDS



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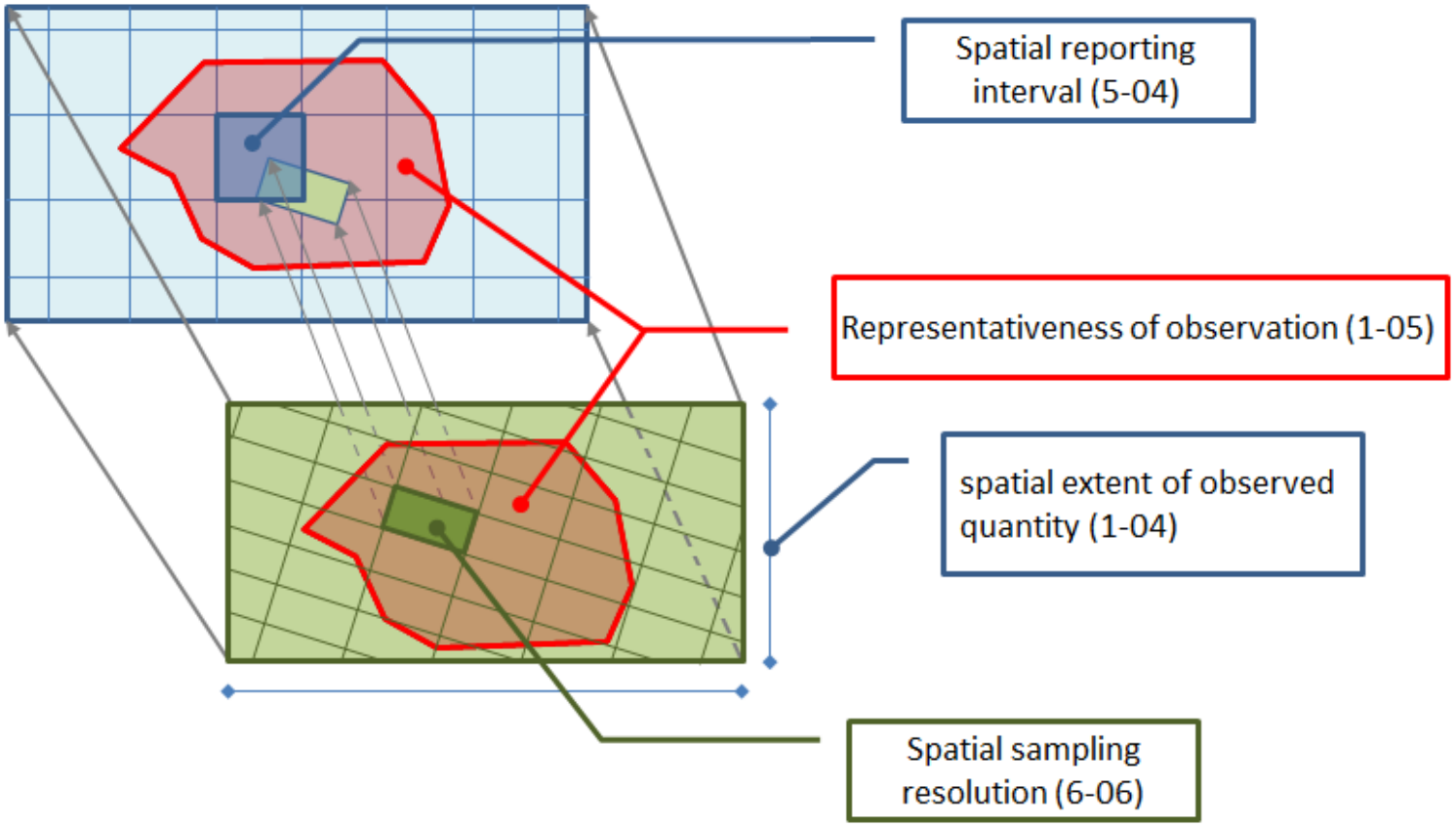
Concepts of space in WMDS



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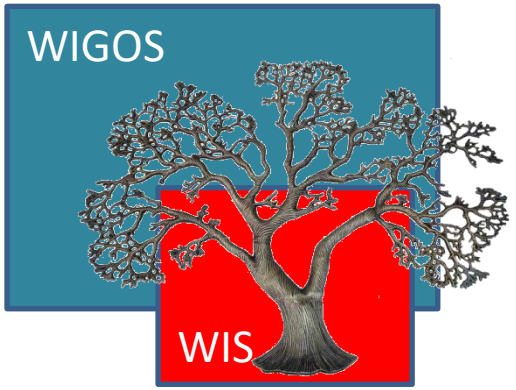
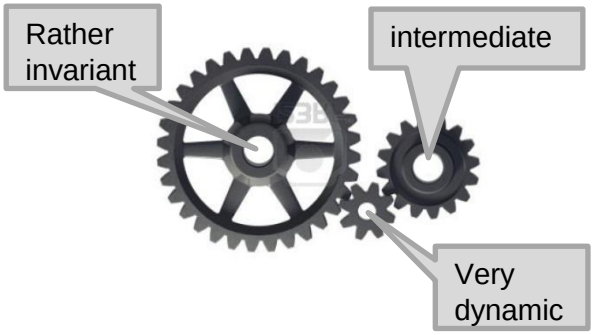
Characteristics of WIGOS Metadata

- Generation
  - Various levels of granularity



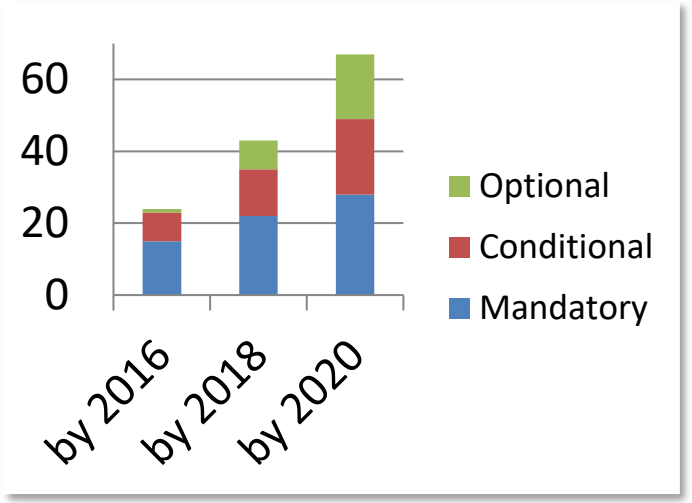
- Transmission
  - Various intervals for (incremental) update



- Access and use
  - By humans (researchers, managers, the public)
  - By machines (services)

Implementation of WMDS

- Reporting obligations
  - Mandatory items (28)
  - Conditional items (21)
  - Optional items (18)
- Adoption in 3 phases
  - Phase I 2016 (24)
  - Phase II 2017-2018 (19)
  - Phase III 2019-2020 (24)



Some elements consist of multiple «atomic» entities

Category	Phase I (2016)	Phase II (2017–2018)	Phase III (2019–2020)
1. Observed variable	1-01 Observed variable – measurand (M)	1-05 Representativeness (O)	
	1-02 Measurement unit (C)		
	1-03 Temporal extent (M)		
	1-04 Spatial extent (M)		
2. Purpose of observation	2-01 Application area(s) (M)		
	2-02 Programmes/network affiliation (M)		
3. Station/ platform	3-01 Region of origin of data (C)	3-04 Station/platform type (M)	3-05 Station/platform model (M)
	3-02 Territory of origin of data (C)	3-08 Data communication method (O)	
	3-03 Station/platform name (M)		
	3-06 Station/platform unique identifier (M)		
	3-07 Geospatial location (M)		
	3-09 Station operating status (M)		
4. Environment		4-04 Events at station/platform (O)	4-01 Surface cover (C)
		4-05 Site information (O)	4-02 Surface cover classification scheme (C)
			4-03 Topography or bathymetry (C)
			4-06 Surface roughness (O)
			4-07 Climate zone (O)
5. Instruments and methods of observation	5-01 Source of observation (M)	5-11 Maintenance party (O)	5-04 Instrument operating status (O)
	5-02 Measurement/observing method (M)	5-12 Geospatial location (C)	5-06 Configuration of instrumentation (C)
	5-03 Instrument specifications (C)	5-15 Exposure of instrument (C)	5-07 Instrument control schedule (C)
	5-05 Vertical distance of sensor (C)		5-08 Instrument control result (C)
			5-09 Instrument model and serial number (C)
			5-10 Instrument routine maintenance (C)
			5-13 Maintenance activity (O)
			5-14 Status of observation (O)
6. Sampling	6-03 Sampling strategy (O)	6-05 Spatial sampling resolution (M)	6-01 Sampling procedures (O)
	6-07 Diurnal base time (C)		6-02 Sample treatment (O)
	6-08 Schedule of observation (M)		6-04 Sampling time period (M)
			6-06 Temporal sampling interval (M)
7. Data processing and reporting	7-03 Temporal reporting period (M)	7-02 Processing/analysis centre (O)	7-01 Data processing methods and algorithms (O)
	7-04 Spatial reporting interval (C)	7-06 Level of data (O)	7-05 Software/processor and version (O)
	7-11 Reference datum (C)	7-09 Aggregation period (M)	7-07 Data format (M)
		7-10 Reference time (M)	7-08 Version of data format (M)
			7-12 Numerical resolution (O)
			7-13 Latency (of reporting) (M)
8. Data Quality		8-01 Uncertainty of measurement (C)	
		8-02 Procedure used to estimate uncertainty (C)	
		8-03 Quality flag (M)	
		8-04 Quality flagging system (M)	
		8-05 Traceability (C)	
9. Ownership and Data Policy	9-02 Data policy/use constraints (M)	9-01 Supervising organization (M)	
10. Contact	10-01 Contact (nominated focal point) (M)		

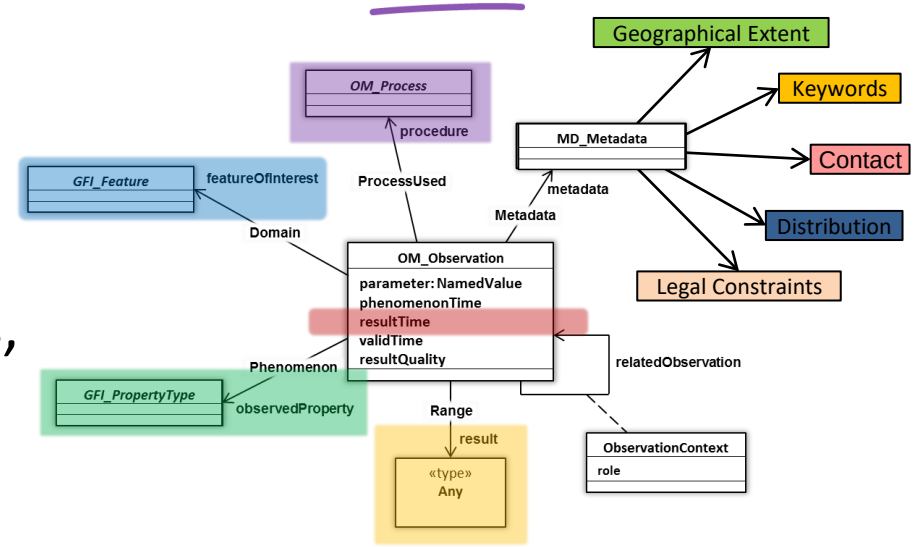
SUMMARY

Summary

- Describe products
- Discovery, access & retrieval
- ISO 19115-2

- Describe observations, stations
- Enable adequate use
- Support rational evolution of observing systems → RRR

OM_Observation: an EVENT whose RESULT is an estimate of a value of some PROPERTY of some THING obtained using a specified PROCEDURE …



MD_Metadata: Something somewhere that can be accessed under certain conditions and about which someone knows more.

- Manadatory, conditional, optional items
- Phased adoption 2016-2020
- ISO 19156 with extensions

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Thank you
Merci
شكرا

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