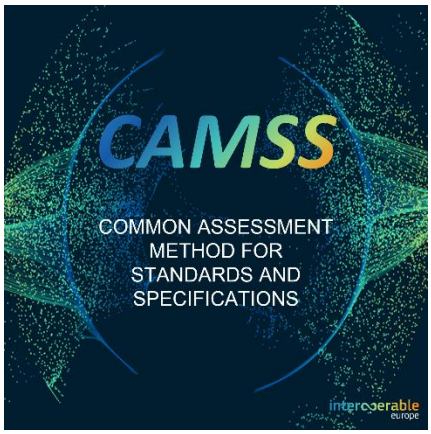

ASSESSMENT SUMMARY v1.0.0

Internet Calendaring and Scheduling Core Object Specification (iCalendar)[1]

IETF[2]

[1] The iCalendar specification homepage: https://www.rfc-editor.org/rfc/rfc5545

[2] The development organisation homepage: https://www.ietf.org/

Change Control

Modification	Details
Version 1.0.0	
Initial version	

TABLE OF CONTENT

1. INTRODUCTION

The present document is a summary of the assessment of the **iCalendar** carried out by CAMSS using the CAMSS Assessment EIF scenario[3]. The purpose of this scenario is assessing the compliance of a standard or specification with the European Interoperability Framework (EIF)[4].

2. ASSESSMENT SUMMARY

The iCalendar specification is a widely-used standard format for exchanging calendars and scheduling information over the Internet. The specification was initially defined in the late 1990s as a standard format for representing calendar data and events in a machine-readable and human-readable manner. iCalendar is currently in use in European institutions, either integrated with widely used software environments, such as Microsoft and Google Calendar or in EU institutional calendaring and scheduling services, such as the EUROSTAT's indicators release calendar[5].

iCalendar is designed to facilitate the sharing of calendar information between different calendaring systems, applications, and devices. Its primary goal is to enable interoperability and seamless communication among various calendar-related software and services, aligning with interoperability and eGovernment practices at the EU level.

The specification has been developed by the Internet Engineering Task Force (IETF), which goal was to propose a shared vocabulary for the web that could be easily extended through a common model. Complementary specifications that enhance the iCalendar specification are also available for free in IETF.

2.1. EIF Interoperability Principles

Interoperability principles are fundamental behavioural aspects that drive interoperability actions. They are relevant to the process of establishing interoperable European public services. They describe the context in which European public services are designed and implemented.

***The specification fully supports the principles setting context for EU actions on interoperability*:**

- **Subsidiarity and proportionality**
  iCalendar is included in 5 national catalogues of recommended specifications according to the CAMSS List of Standards[6]. They belong to Croatia, France, Malta, the Netherlands and Sweden. The National Interoperability Framework (NIF) of France and the Netherlands are fully aligned

[3] CAMSS Assessment EIF Scenario 6.0.0: https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/solution/camss-assessment-eif-scenario/release/600

[4] ISA[2] programme: https://ec.europa.eu/isa2/eif_en

[5] (EUROSTAT) Euro-indicator release calendar in ics format: https://ec.europa.eu/eurostat/news/internet-calendar

[6] CAMSS List of Standards: https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/camss-list-standards

with at least 2 out of 3 sections of the European Interoperability Framework (EIF) according to the National Interoperability Frameweork Observatory (NIFO) factsheets[7].

The specification supports the principles setting context for EU actions on interoperability:

- **Openness**

  The iCalendar format is designed to be easily shareable and disseminated across the internet, making it a good choice for publishing calendar information on websites or web-based applications. Moreover, due to its machine-readable nature, iCalendar has become a widely adopted standard for exchanging calendar data across various platforms and applications, making it an essential tool for automating calendar-related tasks and enabling seamless integration between different software systems.

  The development process has been developed by IETF to make it accessible to the different stakeholders and it also includes a public review. IETF has a formal review and approval so that all the relevant stakeholders can formally appeal or raise objections to the development and approval of specifications. Furthermore, like all the IETF standards, this specification is a free and open technical specification, built on IETF standards and licenses from the Open Web Foundation[8].

  In terms of availability, iCalendar is publicly available, as well as its complementary specifications. It is licensed on a royalty-free basis for its implementation or study.

- **Transparency**

  iCalendar allows the reusability of interoperability calendaring and scheduling solutions, increasing the sharability and searchability of events (events, dates, etc.). The specification favours the promotion of semantic interoperability between different applications and has support from many communities, notably iCalendar.org, a site devoted to the promotion of the standard, as well as offering resources and validation tools. The iCalendar specification has been in use for many years and has become a de facto standard for representing and exchanging calendar data in the digital world. In terms of personal data management, iCalendar defines the data format and media type of text/calendar, which is independent of any calendar service or protocol, and barely gives provisions on the use of other specifications to mitigate possible privacy threads, and thus, protect personal data.

- **Reusability**

  iCalendar focuses on providing a structured representation of events, tasks, and scheduling information, including features such as recurring events, time zones, attendee management, and

[7] NIFO factsheets: https://joinup.ec.europa.eu/collection/national-interoperability-framework-observatory-nifo/nifo-factsheets

[8] Intellectual Property Rights in IETF: https://datatracker.ietf.org/doc/html/rfc8179

reminders. While some administrative information can be included in event descriptions and custom properties, iCalendar is not intended as a comprehensive platform for managing or exposing public administration's services. However, the specification is a widely adopted and standardized format for representing calendar data, making it suitable for applications in different industries and sectors due to its interoperability and compatibility with different calendaring systems and services.

- **Technological neutrality and data portability**
  iCalendar does not rely on other specifications to be used. However, the specification may need to leverage support from other specifications to extend its functionalities. For example, depending on the implementation use case, iCalendar may be leveraged by different extensions. Moreover, the specification allows for partial implementations, giving developers the flexibility to support specific subsets of the standard according to their application's needs. In terms of data portability, by providing a standardized format for representing calendar data, iCalendar ensures interoperability, making it easier to exchange scheduling and event information across different software and platforms. This facilitates seamless data sharing between European public services, supporting efficient collaboration and coordination among various entities (for example, the EUROSTAT platforms).

***The specification partially supports the principles related to generic user needs and expectations*:**

- **User-centricity**
  iCalendar enables the sharing and exchange of scheduling and event information between different systems and applications. This reusability ensures that calendar-related data can be easily imported, exported, and integrated into various software, promoting interoperability and reducing the need for data duplication or manual data entry. As a result, relevant information can be efficiently reused when needed, streamlining processes and enhancing data consistency across different platforms and services.

- **Inclusion and accessibility**
  The purpose of iCalendar is not related to e-accessibility. Therefore this criterion is considered not applicable to the specification.

- **Privacy**
  Public Administrations must consider complementing iCalendar with third-party standards to protect data by applying access restrictions. The protocol for exchanging calendaring and scheduling data should prevent possible unwanted access to information. iCalendar, on its own, barely gives provisions on the use of other specifications to mitigate possible privacy threads, and thus, protect personal data. Unfortunately, iCalendar has not been found included in any initiative covering privacy aspects.

- **Security**
  The secure exchange of data using iCalendar can be achieved by implementing additional security measures, such as encryption, and authentication, and using secure communication protocols like HTTPS when transmitting iCalendar data between systems and applications. The specification introduces certain aspects that an implementer or an owner of the Personal Information Manager (PIM) should consider to secure the processing of data (e.g. when accepting and parsing such information). Access control mechanisms, data integrity and data accuracy are not addressed nor prevented by the specification.

- **Multilingualism**
  iCalendar can define parameters in multiple languages, fully supporting multilingualism and internationalisation. For example, the specification enables the definition of parameters for the same property when two different languages for a time zone exist.

The specification supports the foundation principles for cooperation among public administrations:

- **Administrative Simplification**
  iCalendar is based on Multipurpose Internet Mail Extensions (MIME)[9] content and relies on other specifications (e.g., iCalendar Basic Grammar and Conventions[10]) that enable formats and interoperability features for conveying calendaring and scheduling information between different systems. The specification may also enable digital service delivery channels, as mentioned previously for the EUROSTAT platforms: iCalendar allows EU institutions to place their publications in the form of a calendar on the Internet; this is the case of EUROSTAT, which delivers the Euro-indicator release calendar in ICS format for easy integration into the most popular calendar applications, such as Outlook or Google calendar.

- **Preservation of information**
  iCalendar facilitates the capture and exchange of information that would normally be stored in a calendar and scheduling application. Although the focus of the specification is not data preservation, iCalendar provides a common format that allows a personal information manager (PIM) or group scheduling product to preserve its data.

- **Assessment of effectiveness and efficiency**
  There exist some studies assessing digital solutions' effectiveness that are based on iCalendar; however, most of them are restricted to learning environments. For example, one of these assessments involves Google Calendar and its effectiveness in how this Google application improves a learning platform and how it enhances an efficient reservation of a learning room[11].

[9] MIME: https://datatracker.ietf.org/doc/html/rfc2048

[10] iCalendar Basic Grammar and Conventions: https://www.rfc-editor.org/rfc/rfc5545#section-2

[11] Google calendar in learning environments - Design and Implementation of a Study Room Reservation System: Lessons from a pilot program using Google Calendar: https://research.library.fordham.edu/cgi/viewcontent.cgi?article=1002&context=lib_staffpubs

2.2. EIF Interoperability Layers

The interoperability model which is applicable to all digital public services includes:

- Four layers of interoperability: legal, organisational, semantic and technical;
- A cross-cutting component of the four layers, 'integrated public service governance';
- A background layer, 'interoperability governance'.

The Specification supports the implementation of digital public services complying with the EIF interoperability model:

- **Interoperability governance**
  iCalendar can be mapped with the EIRA's ABB "Mycalendar Component" and "Mycalendar Application" from the Technical View (note that, depending on the ELIS release, amendments may change these associations). Moreover, the specification is included in five national catalogues of specifications and is recommended by EUROSTAT. In terms of implementation conformity, iCalendar provides sets of data values that are valid for each property and parameter. The conformance of such a property or parameter is defined as plain text and can be automatically assessed by using the iCalendar Validator[12].

- **Legal Interoperability**
  After checking the different standard catalogues at the supra-national level, there is no evidence of iCalendar as a European standard.

- **Organisational interoperability**
  Even if iCalendar has been discreetly used in an EU context (EUROSTAT), the specification defines a set of conventions that could be integrated with the depiction of future organisational interoperability agreements. Furthermore, the specification also introduces definitions such as calendaring and scheduling roles that enable the modelling of business processes.

- **Semantic Interoperability**
  There are no communities nor platforms for sharing and publishing iCalendar-related issues on national or European platforms. Therefore, this criterion is not applicable to the specification.

[12] iCalendar Validator: https://icalendar.org/validator.html

3. ASSESSMENT RESULTS

This section presents an overview of the results of the CAMSS assessments for **iCalendar**. The CAMSS "Strength" indicator measures the reliability of the assessment by calculating the number of answered (applicable) criteria. On the other hand, the number of favourable answers and the number of unfavourable ones are used to calculate the "Automated Score" per category and an "Overall Score".

Category	Automated Score	Assessment Strength	Compliance Level
Principle setting the context for EU actions on interoperability	100/100 (100%)	100%	Seamless
Core interoperability principles	1580/1700 (93%)	100%	Seamless
Principles related to generic user needs and expectations	760/1200 (63%)	83%	Sustainable
Foundation principles for cooperation among public administrations	380/500 (76%)	100%	Sustainable
Interoperability layers*	800/1000 (80%)	90%	Sustainable
Overall Score	3320/4200 (79%)[13]	93%	

**The technical interoperability layer is covered by the criteria corresponding to the core interoperability principle ''Openness''.*

With a 93% of assessment strength, this assessment can be considered representative of the specification compliance with the EIF principles and recommendations.

The Overall Automated Score of 79% (3320/4200) demonstrates that the specification supports the European Interoperability Framework in the domains where it applies.

[13] See the "results interpretation" section of the CAMSS Assessment EIF Scenario Quick User Guide:

https://joinup.ec.europa.eu/collection/common-assessment-method-standards-and-specifications-camss/solution/camss-assessment-eif-scenario/results-visualisation-and-interpretation