CEPC DeepC Status

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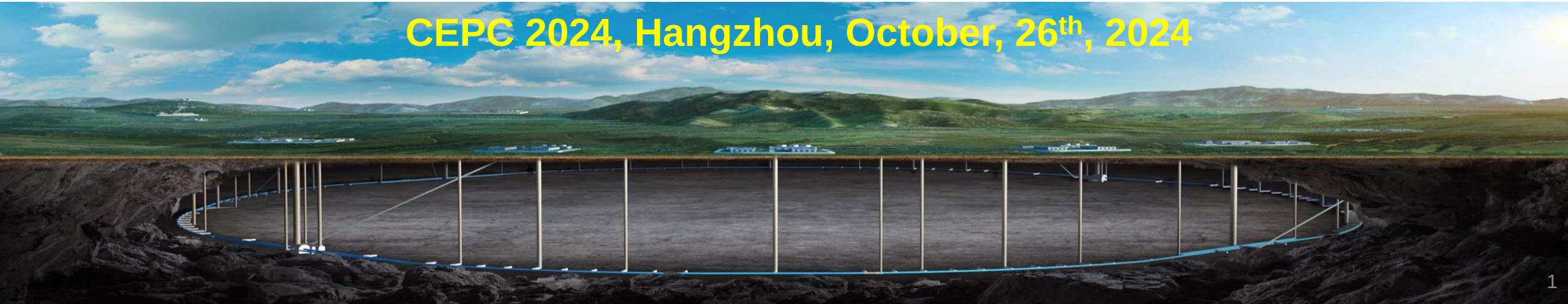

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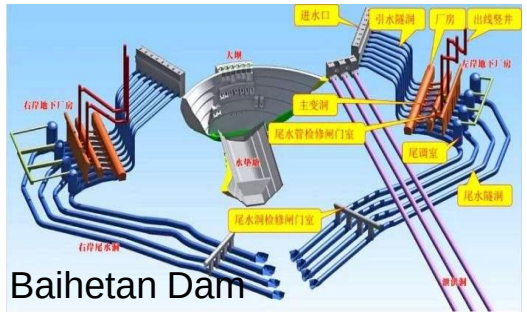
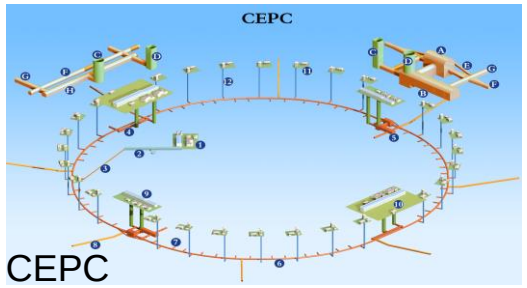
Introduction

- DeepC is a software tool for developing data management systems. It is exploited by Huadong Engineering Company (HDEC), a member of CEPC Industrial Promotion Consortium (CIPC).
- One of the main works of HDEC are on traditional projects such as hydropower stations, and has a team to provide a all life-time customized digital software for the large projects.
- It is some similar as CEPC. So, the collaboration was conducted on the data management system of CEPC.

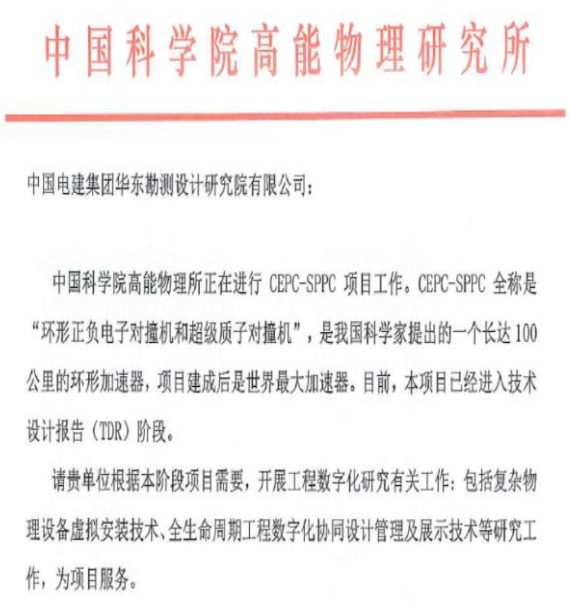

Baihetan Dam, ~178 Billion RMB



Baihetan Dam



CEPC


中国科学院高能物理研究所

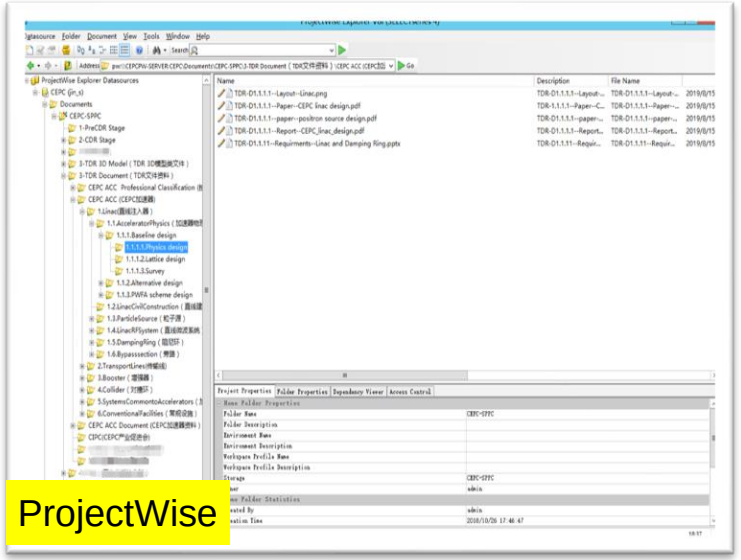
中国电建集团华东勘测设计研究院有限公司：

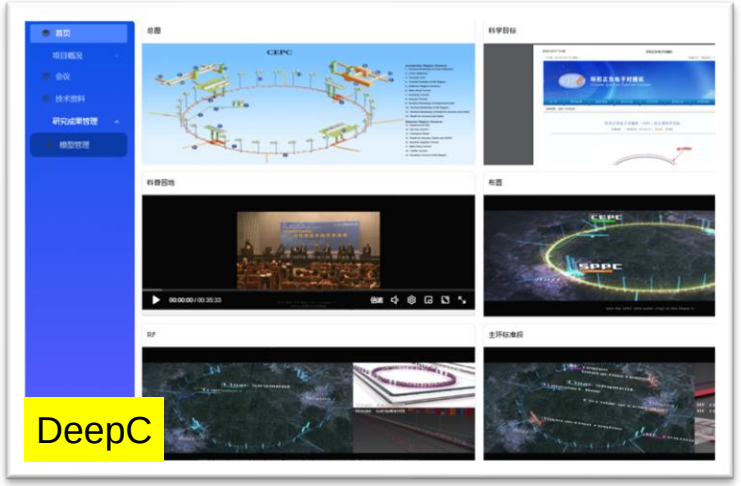
中国科学院高能物理所正在进行 CEPC-SPPC 项目工作。CEPC-SPPC 全称是“环形正负电子对撞机和超级质子对撞机”，是我国科学家提出的一个长达 100 公里的环形加速器，项目建成后是世界最大加速器。目前，本项目已经进入技术设计报告（TDR）阶段。

请贵单位根据本阶段项目需要，开展工程数字化研究有关工作：包括复杂物理设备虚拟安装技术、全生命周期工程数字化协同设计管理及展示技术等研究工作，为项目服务。

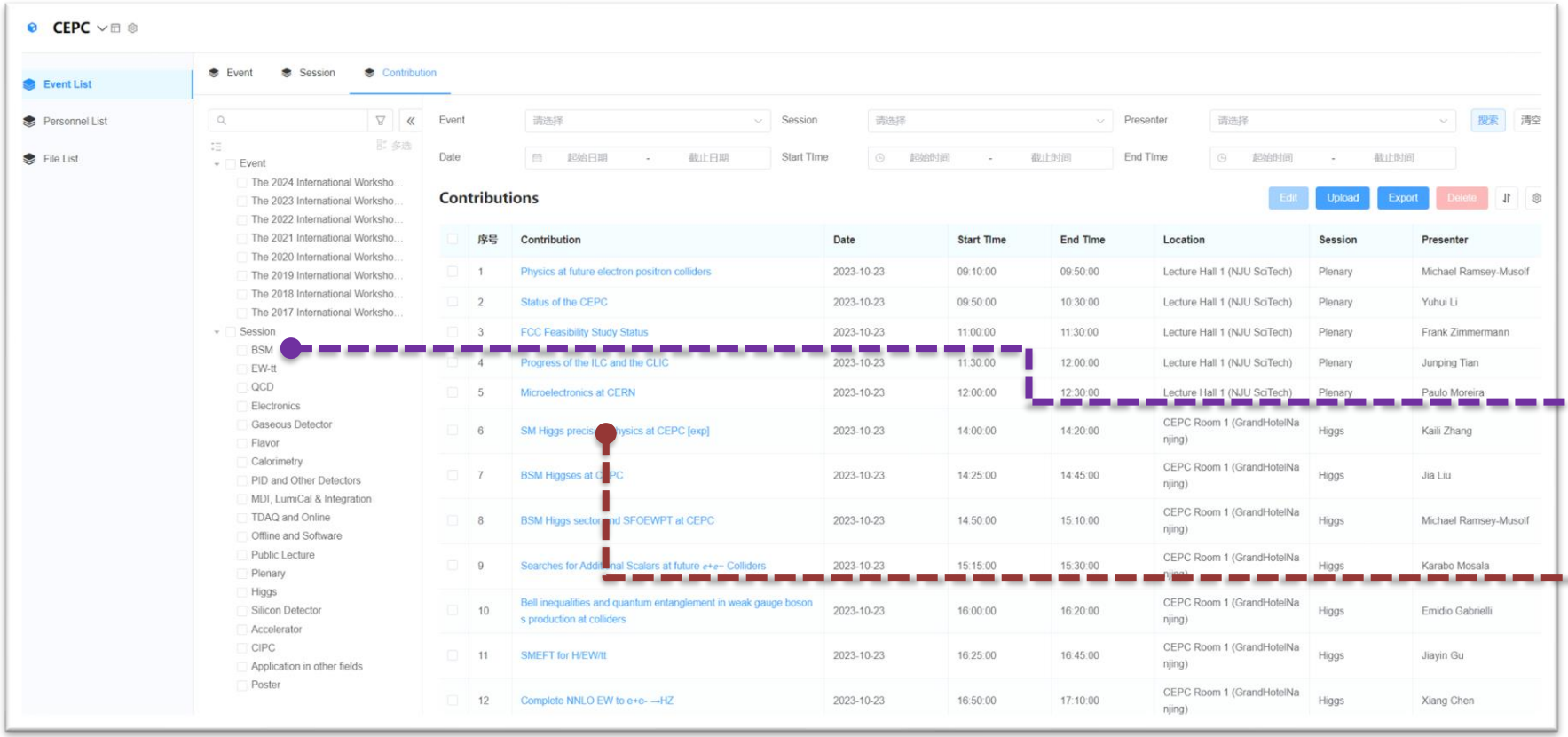
Why develop a new software

	Traditional projects (e.g. hydropower station)	Scientific/modern projects (e.g. CEPC)
1	Most were hosted by one company and have standard data management products	More collaboration and Non-standard products
2	Can be strictly decomposed into multiple engineering stages with fixed processes	High degree of process freedom and Relative long project time span
3	Relatively easy. The difficulties of management can be overcome by using more full-time personnel.	Structure is more complex and professional. The overuse of scientists for management is a waste of talent.


ProjectWise


DeepC

Interface of DeepC



- The system interface can be customized freely.

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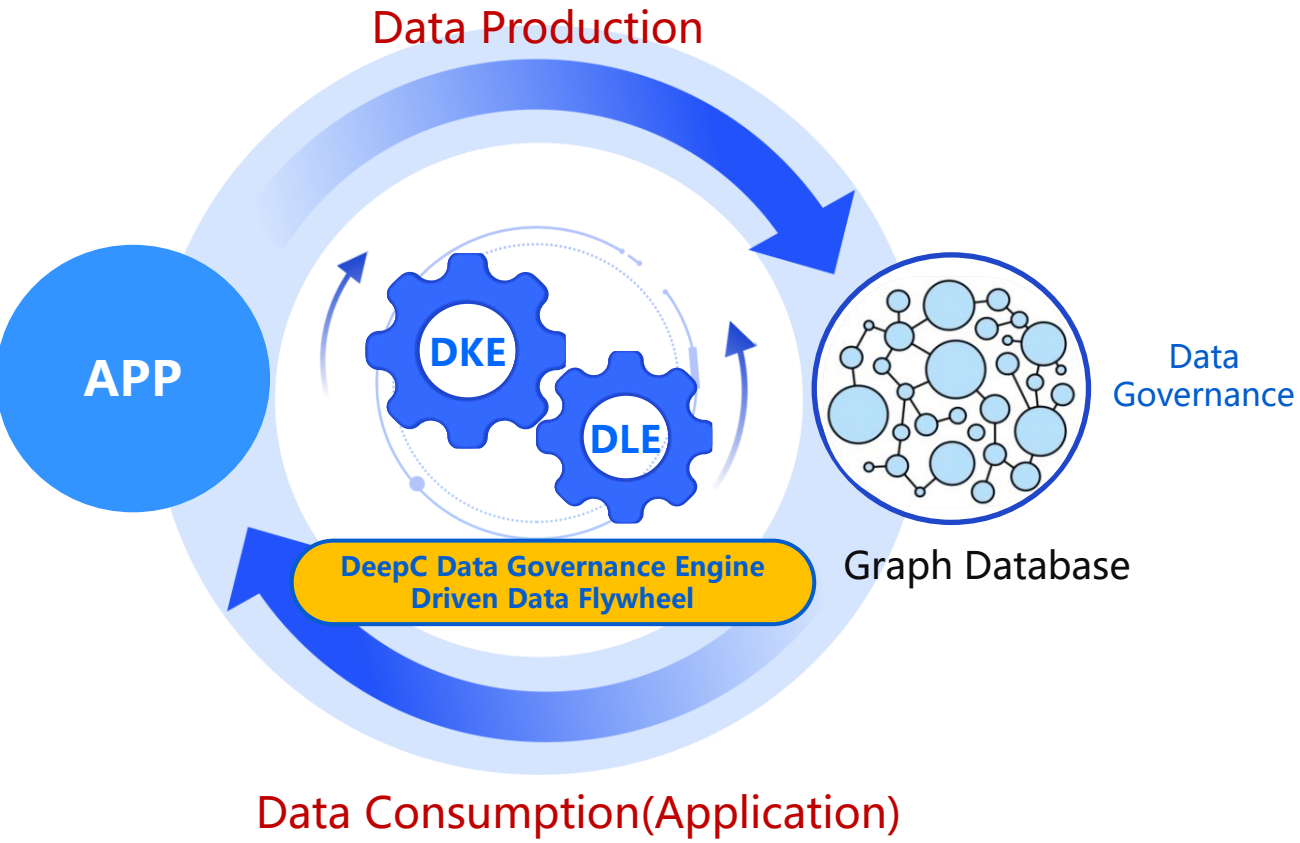
1. Basic functions of DeepC have been achieved



5. DeepC application layer
- Various applications based on data center

4. Data platform
- Clusters of technical asset management sites

(like DocDB)

3. Operation system Creation Layer
- Rapidly build various engineering business system applications without code or with low code

(like indico)

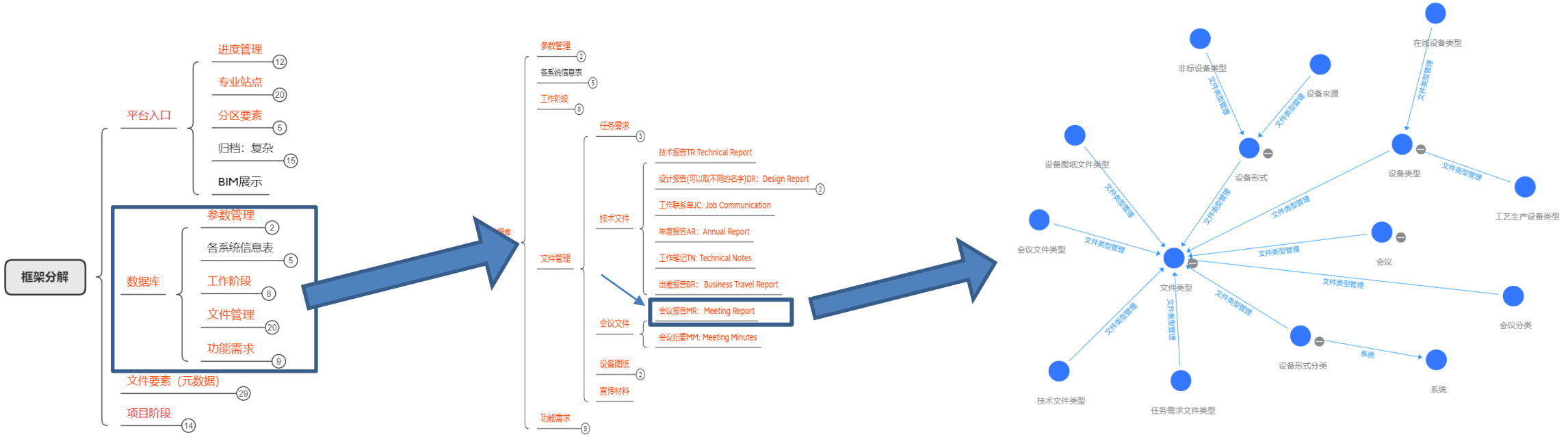
2. Technology middle layer
- IT implementation and encapsulation of basic functional components of data management

1. IT basic service layer

Hierarchical Structure of DeepC

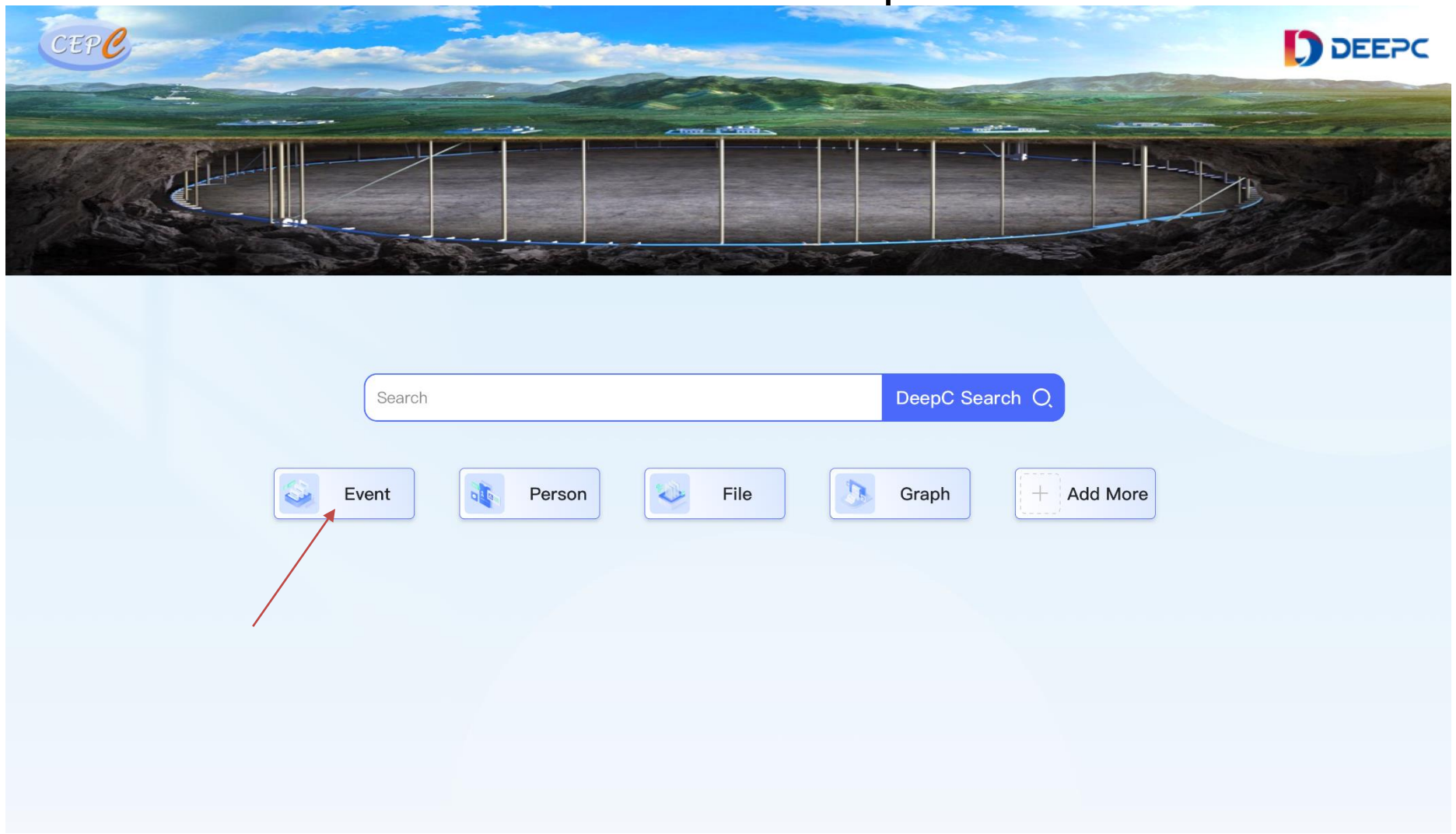
2. Draft framework and build initial database

- After initially drafting the data framework for the CEPC accelerator, discussions were held with HDEC regarding the implementation of the DeepC system.
- Utilizing publicly available events and news articles from previous years as source material, data was entered into the system to create a graphical data model.



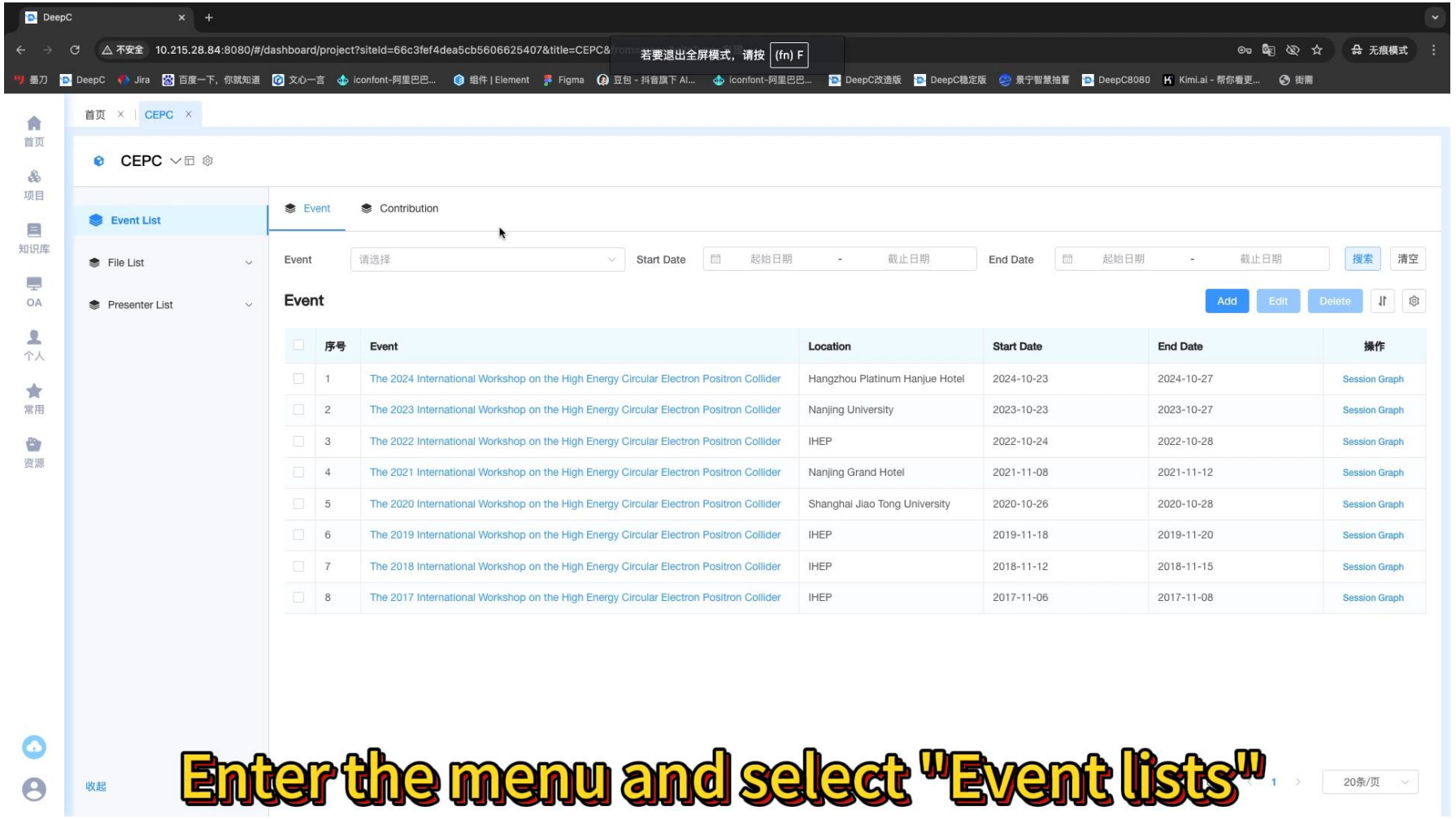
Document management

- View various data related to the event from multiple dimensions.



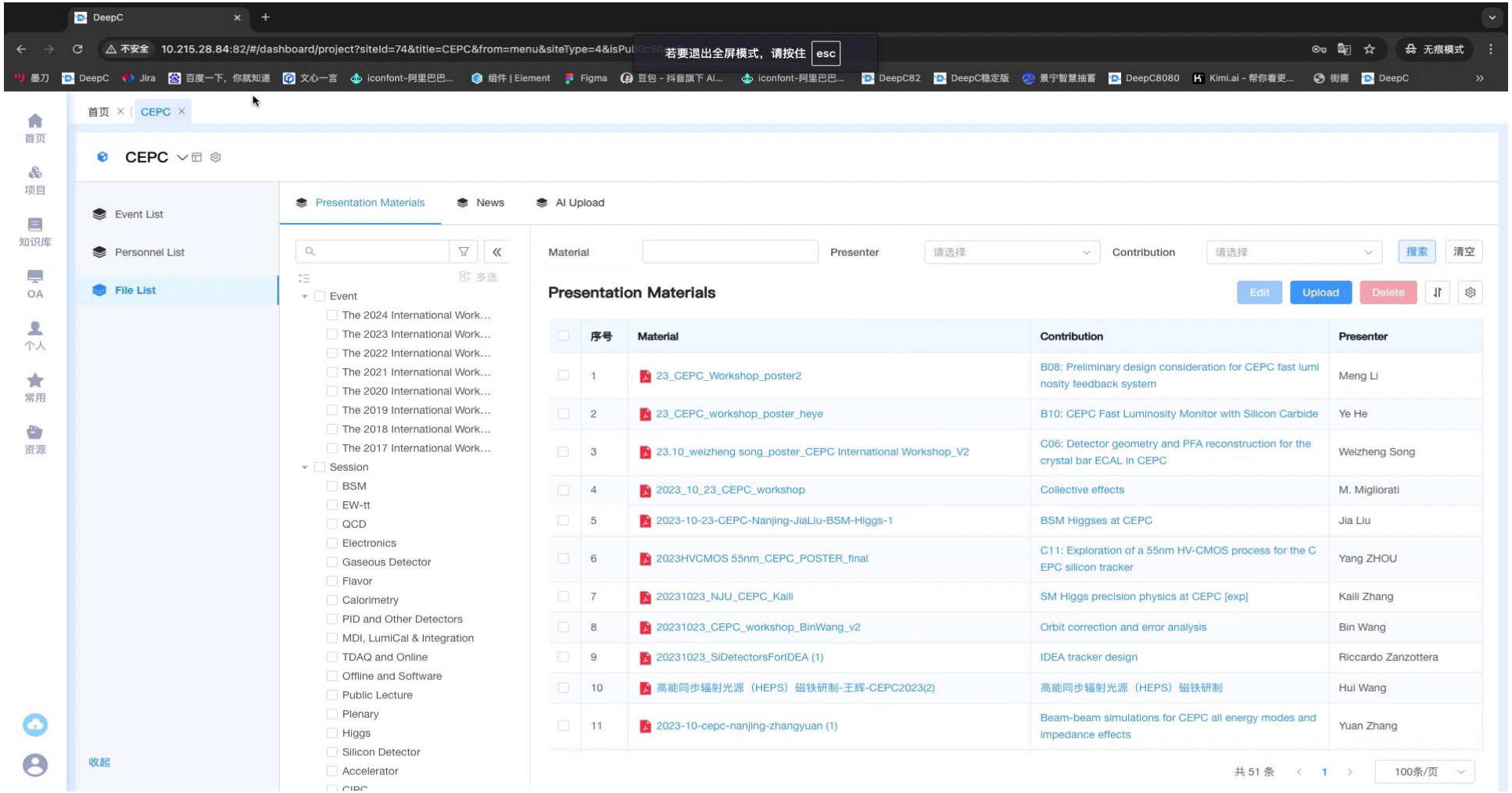
Meeting Document management (Video 1)

- View various data related to the event from multiple dimensions.



News articles management (Video 2)

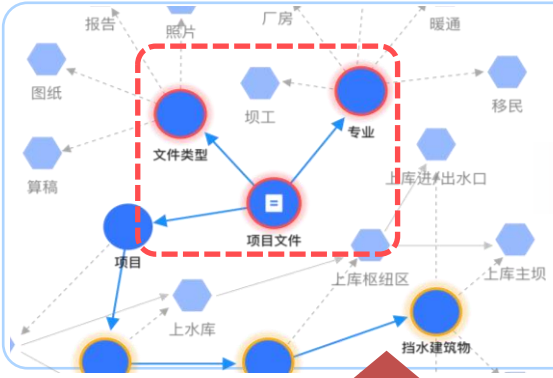
- As the pilot work progresses, more data is being added, such as news articles.



3. Developing the Intelligent recognition

Intelligent Recognition (for automatically identifying metadata of uploaded files)

File Upload



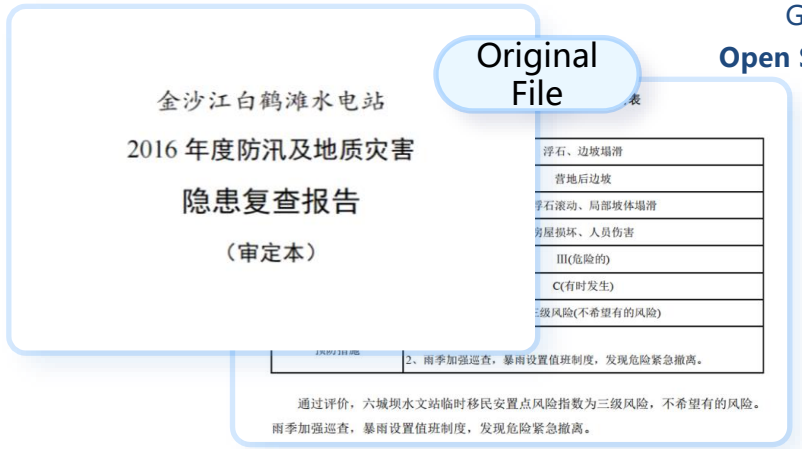
Custom Combination Directory to Display Corresponding File Sets

- 专业
  - 坝工
  - 厂房
  - 引水
  - ……
- 文件类型
  - 图纸
  - 报告
  - 算稿
  - 照片

项目文件	专业	文件类型
白鹤滩电站正常蓄水位专题报告	坝工	报告
白鹤滩电站水库平面布置图	坝工	图纸
白鹤滩电站水库面板堆石坝结构布置图	坝工	图纸
白鹤滩电站水库结构布置图	坝工	图纸

Fully Automated File Processing

Original File



General Text (Specifications, Reports, etc.)

Open Source + Self-Developed Optimization Too

Fully Automatic Processing

Recognizing

File Content Recognition

Directory

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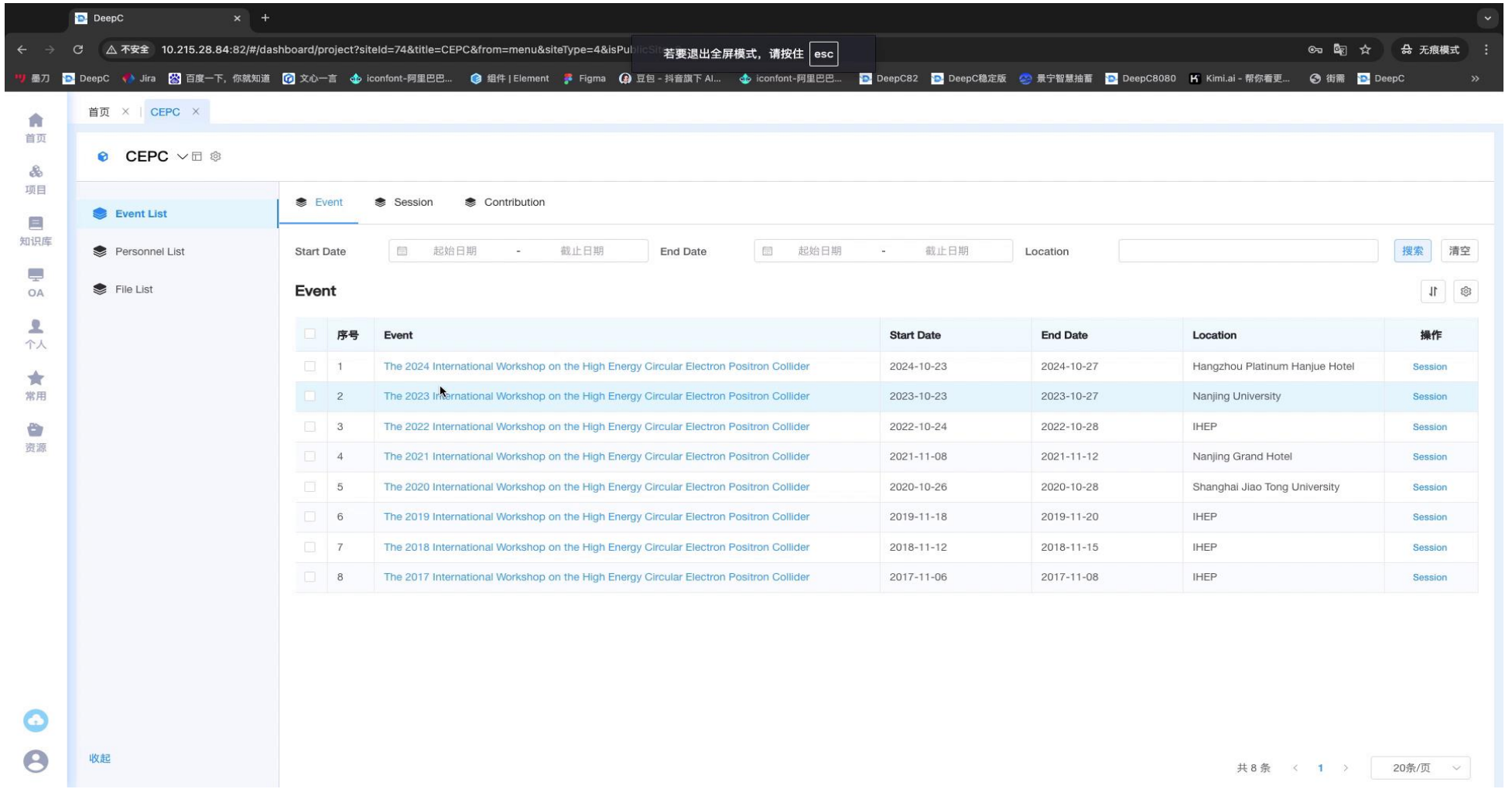
Preliminary Intelligent recognition (Video 3)

- To reduce the workload of manual data entry, DeepC has implemented a function that automatically recognizes some file metadata upon upload.



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Summary

- The documentation system for CEPC accelerator was initially developed based on DeepC.
- In the application processes, DeepC is in continuous iterations and enhancements of functionalities.
- The structure of accelerator documentation system will also be continuous optimized together with improvement of DeepC, with the aim to become a project data management tool for CEPC.

Thanks!