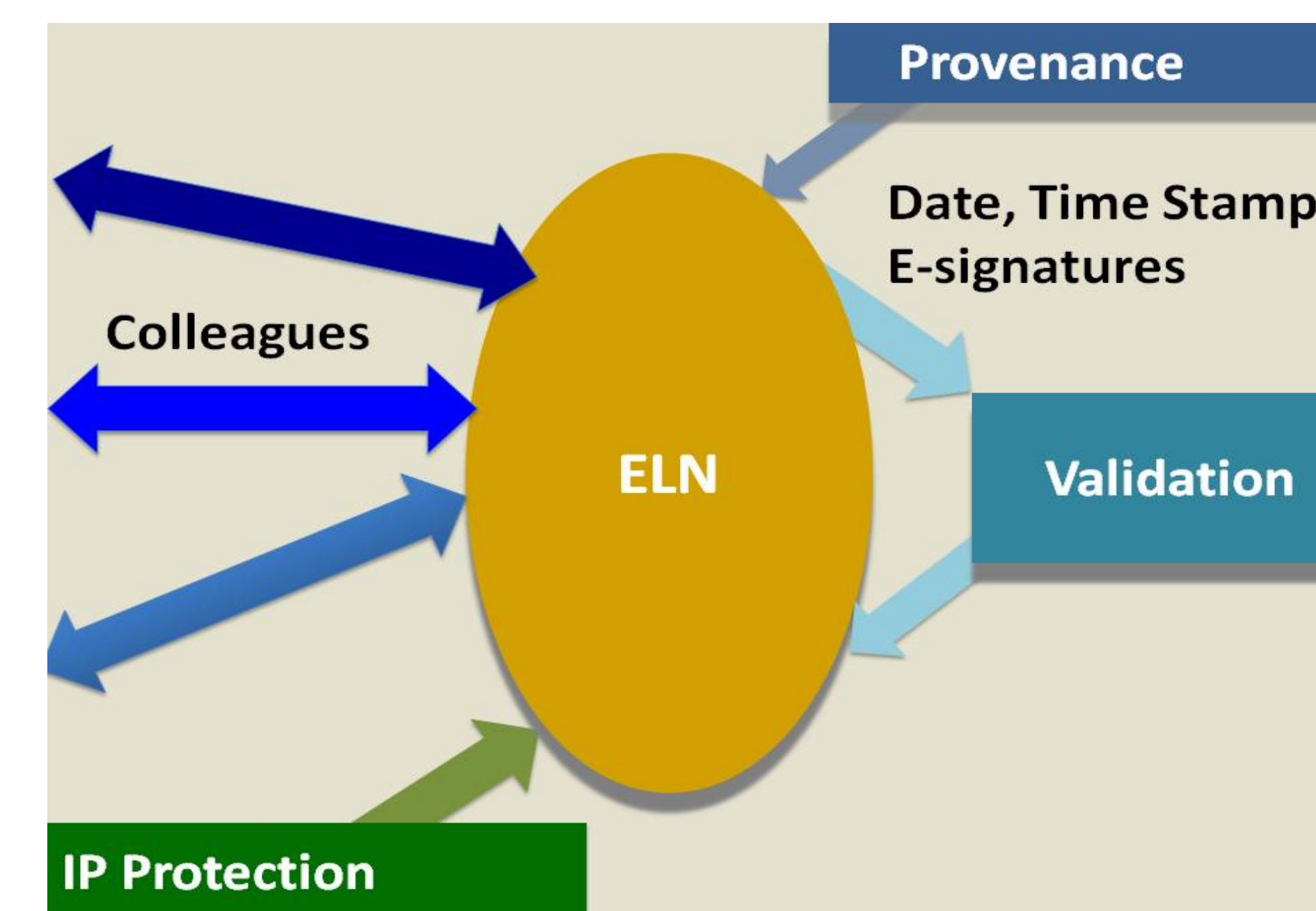
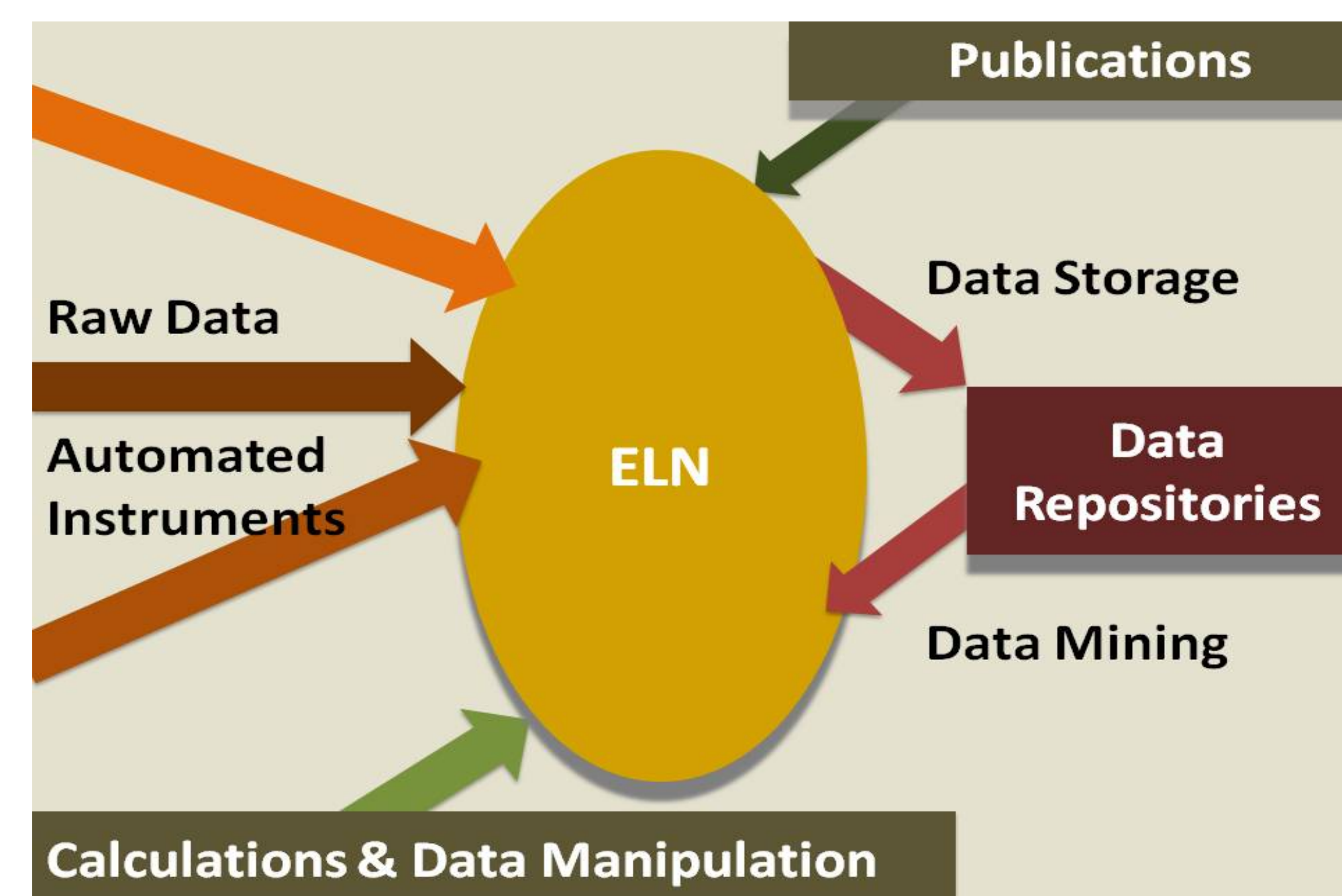


The Data Layer

In the data layer researchers access and work with the raw data (or primary resource). These data can be streamed into the system. Researchers can also refer to information contained within publications, mine for additional data located in repositories, and develop models and simulations. The data and related documentation are stored in a repository and eventually will be stored in a long-term data repository.



The People Layer

The people layer includes all colleagues in the research group – across the lab bench or across the ocean. Permissions are set as to who has access to the various areas of the ELN. Here provenance is recorded, i.e. how the data is collected, what is being done with the data, when and by whom. This validates that the different experimental steps were performed, by whom and when. The PI can monitor progress of each worker and of the entire project from his or her computer.

Why Use ELNs –

Points to Consider When Implementing an ELN –

EFFICIENCY Multidisciplinary projects and increased collaborations with colleagues worldwide increases the complexity of managing projects. Even managing the projects over the course of a career is cumbersome. ELNs provide an efficient system of organizing the work, the data and related documentation. Finding the needed data and/or document is simplified.

PROVENANCE Any good ELN will be 21 CFR Part 11 compliant. How the data was collected, manipulated and analyzed and by whom and when each procedure was performed along with any changes is recorded. This is important for patents and commercialization of any products. Also, any accusation of fraud can easily be addressed.

PERSONNEL TURNOVER Turnover of personnel sometimes means the data or other important information walks out the door. Implementation of an ELN eliminates this concern.

LEVELS OF ACCESS Not all members of the research group require access to all aspects of the research. A good ELN will provide a system of access, allowing for different levels of access to different parts of the research. In addition, the project can be accessed from anywhere and at any time.

STUDENTS These systems are already being used in industry; therefore to be employable students need to be acquainted with them.

DATA MANAGEMENT PLANS Granting agencies are becoming more interested in the way research projects are being managed. Implementing ELNs can meet the requirements of mandates for data management plans.

IMPLEMENTING AN ORGANIZATION-WIDE ELN

Learn Perform a needs assessment of the researchers to determine knowledge, needs and what is already being used. Determine if the policies, best practices of your organization address electronic files and ELNs. Determine IT support since the software may be maintained on your institution's servers. Determine if there is support from the office responsible for purchases (universities it would be the Office of the VP for Research).

Promotion Talk to IT and administration to make sure they are on board. Talk to research groups about pros and cons of ELNs. Listen to researchers to learn of their concerns and needs. Bring in vendors (webinars) to demonstrate their products. Listen to the questions researchers ask of vendors.

Approval Obtain approval for adding the cost of implementation to the yearly budget. Request the vendors to provide you with an estimated cost of implementing ELNs at your organization.

Trials Select a group of researchers interested in ELNs. Ask the researchers which ELNs they would prefer to test. Develop survey to be administered before and after the trials. Develop a data management workshop to go along with ELN training. Bring in the vendors for training in use of the ELNs. Administer surveys, focus groups.

Implementation Select an ELN from the results of the assessment. Work with IT and vendors in implementing software. The initial group of researchers will act as promoters/champions of the ELNs bringing in new researchers. Add the new researchers.

Assess One year after implementation administer new surveys, focus groups to determine issues. Address the issues with the vendors, IT or appropriate party.

What are researchers in the discipline using?

What do you want the system to do for your research group?

How much security do you need? (HIPAA, endangered species, patents, commercialization)

How much training is involved?

What is involved with the setup?

Are there any hidden fees?

Is there a startup fee, configuration fee, training fee and/or a yearly maintenance fee?

How is it going to be paid for?

Is the system compatible with your present hardware and software?

Can data, documents, etc. be easily exported?

How much support does the vendor provide?

Is it better to use the vendor's cloud or the organization's IT servers?

Can the ELN be easily and inexpensively implemented in classrooms?

How long has the vendor been in business?

How long has the ELN been available?

Is the vendor actively adding new features to the ELN?