Editorial

Safeguarding Scientific Legacy — The Imperative of Preserving Scientific Data by Pakistan Journal of Ophthalmology and Ophthalmological Society of Pakistan

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Science is not a momentary endeavor, but a grand edifice built upon the foundations laid by the pioneers. Every invention rests on prior work, case studies, clinical trials, and published research. Without access to historical data and peer-reviewed literature, researchers face unnecessary redundancy and inefficiencies. In clinical science, it is not just the historical context that matters, but the data itself is extremely valuable, which is painstakingly collected over years of research. Every detail, no matter how small, contributes to reproducibility, which becomes impossible if data and methodologies are lost to time or technical failure.[1]

The concept of data preservation has deep historical roots. One of the earliest examples can be seen in cave paintings, which served as primitive efforts to record and transmit knowledge across generations. The invention of the printing press marked a significant advancement, making the reproduction of information far easier. It enabled the mass production of books, greatly expanding access to knowledge. As literacy rates increased, data collection and documentation grew exponentially in both scale and scope. Later a German engineer invented the first magnetic tape in 1928. This technology allowed for data to be stored magnetically on tape, and it was used extensively for audio and video recordings.[2]Soon it became a popular storage medium for data storage and backup systems and was widely used by businesses and governments for many years. As scientific research and technological advances generated increasing volumes of data, the need for effective data preservation grew accordingly. Libraries were established, modern technologies were developed, and extensive efforts were undertaken to safeguard this growing legacy.

Efforts to preserve data were often undermined by the devastating impact of catastrophes, particularly wars. For instance, during World War II, significant amounts of data were lost or destroyed, despite the dedicated efforts of scholars and librarians to archive journals and datasets.[3] This led to enhanced efforts to safeguard the scientific heritage. In 1990s, JSTOR was founded with aim to digitize previous issues and make them available online.[4] Likewise, recently the LOCKSS (Lots of Copies Keep Stuff Safe) program, initiated by Stanford University Libraries and CLOCKSS (Controlled Lots of Copies Keep Stuff Safe) digital repositories were established to preserve the scientific data.[5] There are a lot more available online. Digital content is not entirely secure, as it remains vulnerable to issues such as obsolete file formats, server failures, and cybersecurity threats. Today, cloud-based repositories are widely used for storing and retrieving data, offering greater flexibility and scalability. Artificial intelligence and machine learning have proven valuable in organizing, transcribing, and managing large archives of scientific documents. Additionally, the open access policies adopted by some journals play a crucial role, not only by providing free access to research data but also by facilitating its preservation across multiple platforms.

The Pakistan Journal of Ophthalmology was established in 1984, and in 2025, we proudly present its 41st volume. Upon reviewing the archives, it was discovered that some records of earlier volumes were missing. This prompted an initiative to retrieve, scan, and digitally archive all previous issues, while also preserving printed copies. Efforts were made to search for the missing volumes and scan the recovered editions for online access. The hard copies are being re-produced for safekeeping in the PJO Library at the

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OSP House in Lahore. The project is now nearing completion, with approximately 90% of the work being finalized. The older issues will soon be accessible online, ensuring both ease of access and long-term preservation.

In 2021, the Pakistan Journal of Ophthalmology adopted the Open Journal System (OJS) for managing workflow of the journal. With this platform, the journal now benefits from integration with both LOCKSS and CLOCKSS, ensuring robust digital archiving. All newly digitized content will also be incorporated into these systems to guarantee secure, long-term access for future readers and researchers.

For scientific data preservation, another step has been taken, and a significant milestone has been achieved. This is related to the preservation of scientific conference data. OSP Lahore has taken the initiative to archive the proceedings of Lahore Ophthalmo 2024. These proceedings are now accessible online, and with permission from the respective speakers, selected plenary lectures have been included in the guest editorial of this issue. These efforts represent a crucial step toward safeguarding our scientific heritage for future generations.

Science thrives when it is remembered. Preserving scientific data and journals is not merely about looking back, it is about empowering the future. If we neglect this responsibility, we risk repeating past mistakes and stalling progress. But with deliberate action and global cooperation, we can ensure that the knowledge we build today will guide generations to come.

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