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## Interview with Lawrence F. Buckland

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# Lawrence F. Buckland

Founder and President, Inforonics, Inc.

Interview by Judy Luther (The Faxon Company)

*I met Larry Buckland at Meckler's Internet/Document Delivery Conference in New York City in December. Katina had told me about their putting publishers catalogs on the Internet and I found Larry's background a natural fit for the evolving applications. For more about Inforonics products, see Innovations (this issue, page 22) which talks about the Inforonics Internet Catalog. — JL*

**ATG:** What is your background and what led you to this field?

**LB:** I grew up in Schenectady NY where both my parents worked for General Electric as engineers. I took mechanical engineering at MIT where my mother graduated in the class of '21.

I entered the Air Force in the '50s via ROTC and worked on problems in intelligence related to data gathering, storage and retrieval. At that time computers were used to crunch numbers and were not accustomed to sorting words, so we began experimenting with text databases.

I was lucky in this early work not to have any background in numerical computing because it caused me to question computer capabilities as they related to text processing. Why no upper and lower case printing or no special symbols? Why are there only fixed fields? They are awful for text. Had I been skilled in numerical computing I might not have asked these questions and been stymied, or simply jammed text problems into the current capability as was done by the early developers of KWIC indexes and bibliographies.

During this time, I became familiar with the **Council on Library Resources** and the **Science Information Project** of the **National Science Foundation** who were focused on problems of the collection, publication, and distribution of scientific information, and the application of computers to libraries.

When I left the military, I worked for Itek Corporation where we applied computer techniques to photointelligence report publication and created pre-MARC library retrieval systems. In 1962, I decided to start Inforonics (INFOR-mation Electr-ONICS) because I thought it was



time to apply the experimental technology in practical ways. As it turned out, I was a little early.

**ATG:** What were the early important projects for Inforonics?

**LB:** The first project was to create a database and print product from the same keyboarding process instead of printing a publication and then rekeying the data to create a database. To generate future products, we identified and tagged fields to manage the text processing. The National Science Foundation contracted

***"That computer is now at the Computer Museum in Boston."***

with Inforonics to test this concept by experimentation with a journal of one of its grantees the **American Institute of Physics**. The project demonstrated that a journal publisher could create indices from the process as well as an abstract database. It also laid out a workable approach to multifont composition and accommodation of special characters and diacritics. Later on NSF introduced us to APA's *Psychological Abstracts* and we converted its operation and produced the journal from a database in 1967.

A second demonstration project was done for **Verner Clapp**, the first president of CLR, who wanted LC to distribute machine records as well as catalog

cards. Inforonics created a demonstration project to show what could be done with the technology. This project created quite a stir and CLR distributed over 7,000 copies of the final report. LC carried forward with this concept and hired **Henriette Avram** who, as we all know, managed the MARC project, a landmark effort which developed the excellent, robust standard we have today.

During these early projects we worked around the shortcomings of computers when applied to text. The upper and lower case problem was solved using as input devices punch paper tape controlled Flexiwriters developed for automated letter writing, and as output devices Teletypesetters developed for typesetting wire news stories using paper tape. About this time we purchased a Digital Equipment Corporation PDP-1 with internal codes which managed upper and lower case, paper tape input and output, and a video display which opened up the way to interactive editing. We did a lot of pioneering programming with this machine and it all eventually worked in a production mode. That computer is now at the Computer Museum in Boston. Inforonics' **Bill Nugent**, now at the Library of Congress, did a lot of the early work. One very significant paper that comes to mind describes some of his work is titled "A Machine Language for Document Transliteration" which solved the special symbol problem.

**ATG:** What do you consider your greatest contribution and who were your mentors?

**LB:** There are two aspects to text processing which have been part of the Inforonics approach for over 30 years. The first is to capture text at the point of keying for producing different products and the second is to code text with tags indicating the content (previously typesetters used codes indicated the type font, but not the content).

I actually credit my mother for the inspiration for the first. She enjoyed doing double crostic word puzzles in the *Saturday Review of Literature* and sent me one of its articles by Elmer Hutchinson of the American Institute of



Physics. This article described the explosion of scientific information in the '50s and the scarcity of Monotype operators needed to keep up with mathematical typesetting required by the exponential growth in scientific publishing. It was this article which prompted the idea for me that data could be captured during manuscript preparation and

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*"The opportunity presented by the Internet and its successors is akin to Gutenberg's movable type revolution."*

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automatically typeset, thus eliminating the need to rekey it into a database later on.

**Verner Clapp** was a very energetic person, and although not technical, made sure we were working on the practical library problems which needed to be solved. He liked me because I could talk to librarians. **Bill Nugent** and **Henriette Avram** I've already mentioned. However, there were many others. **Paul Fasana** taught me library cataloging theory and spent quite a while explaining things like the difference between a main entry and an author.

*ATG: Your application must have been a major shift in the approach to using the technology—from simply typesetting printed products to creating a database at the point of keyboarding.*

**LB:** Yes, we had to write programs that allowed us to tag the content fields which also had word processing/full screen editing ability. We also wrote programs to manage text databases and programs to produce both printed products. We used these software design features in programs that supported libraries in creating catalogs of books, and publishers in creating reference books.

*ATG: Tell us a little about Inforonics.*

**LB:** We are located in Littleton, Massachusetts with 22 employees including some part-time employees who do data input, editing and proofreading. Fourteen of these are technical staff who adapt software to our text processing needs and manage production for clients.

Ninety percent of our business is with publishers, providing them services to create new products which utilize database technology. For example, **John Wiley & Sons** just asked us to create a CD-ROM catalog of all of their books

from a database we maintain which produces their printed catalogs and brochures.

For the **American Library Association** we installed MARC cataloging and editing software to support the publication of its *Guide to Reference Books*.

For the **American Meteorology Society** we designed a system to produce a glossary of meteorological terminology. We also maintain their article abstract database (MGA) producing output in print, CD-ROM, and DIALOG input format.

In addition to this publishing work we have library clients who use our MARC catalog software for rare book and manuscript catalogs. At present this is a small new business.

We exhibit at library, information science, and publishing organization meetings as well as the newer network, multimedia and electronic publishing shows.

*ATG: What types of services do you provide to publishers?*

**LB:** In helping publishers create new products for electronic databases we can provide complete consulting, design, prototyping, and production services. We provide keyboarding, proofreading, computer processing, data access services, and output to print, CD-ROM, or to a network. However, most customers use us for only the services they cannot do themselves. We bring expertise in the design of tagging systems for all types of books including glossaries, encyclopedias, catalogs, indexes, guides, directories and textbooks.

The technologies we use are text database maintenance, SGML tagging design, database typesetting, CD-ROM production, maintenance of host services on the Internet, and providing software for editors and production staff. We are in the process of adding image processing as it is becoming practical to do so.

We have a full complement of equipment, laser printers, phototypesetters, and UNIX MS-DOS, WINDOWS and Macintosh platforms. Our TCP/IP LAN is directly connected to the Internet.

*ATG: Where is Inforonics going? Have you considered going public?*

**LB:** The basic tenets of Inforonics, text capture and content tagging, will become more viable than ever because low cost electronic distribution will increase the value of the databases we produce. The opportunity presented by the

Internet and its successors is akin to Gutenberg's movable type revolution.

One challenge of the future is to use the new electronic distribution facilities wisely, not like some TV programming. I am confident educators, publishers, and librarians will do this, and Inforonics will have the technology there to help them. A second challenge is not to go broke from high development costs. Unlike our past where we had to develop original software from scratch to handle text problems, there is a lot of capability available which we will modify to suit our needs at modest cost.

For our customers economical product applications will emerge which will draw on standard approach requiring little development cost. To this end we have already announced an Internet Prototype Workshop which publishers can attend to try product ideas at low cost.

We have no plans to go public with Inforonics.

My personal technical challenge is to work on procedures to use networks in a new teaching process where a student will travel the information sources and where the distinction between publishers, librarians, and teachers will be difficult to see. New types of reference products will emerge which integrate or span the range of information types from research articles to reviews to encyclopedia entries to glossaries. The "traveling" procedure needed will operate in a text-book mode, but will have much more branching capability. I hope that systems like this may slow the growth of

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education costs through better network integration of existing resources and elimination of duplicate programs.

*ATG: Larry, what do you do for fun?*

**LB:** Well, I never saw a museum I didn't like and I enjoy exploring by car. For years I sailed a Thistle competitively, but my kids have left home and I have no crew. I guess I will get a Laser. I also have a well equipped shop and like to build things, although I will have to wait for the grandchildren to grow a little before I can start any big projects. I am also interested in the history of science and engineering, especially in canals. ☞