

HVTO Industry News

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Entrepreneurial Spirit:

Ernie Crawford EDP

President

Crawford Technologies Inc.

Part One:

Entrepreneurial Background Leads to Vast Knowledge of HVTO

Growing up, Ernie Crawford EDP thought a lot about what his future might hold. "As a child, I always dreamed that I would run a business, but I had no idea it would be in technology," he says. "I was always fascinated with technology, but coming from a family in the service business, running a chain of hotels would have been more in keeping with tradition."

During his childhood, Crawford was already catching the entrepreneurial spirit. "When I was young, I worked at my father's business doing anything that was needed, including store clerk, gas station attendant, maintenance worker, fishing guide and recruiter," he recalls.

In Fort Frances, Ontario, Canada, just a stone's throw away from Minnesota, early role models set the stage for Crawford and his budding business sense. His father and uncles all owned service businesses, such as tourist resorts, restaurants and hotels. "They were my entrepreneurial role models as they were able to build well respected profitable organizations by providing excellent customer service. I was inundated with all the secrets to the success of running a business, and grew up thinking it was all just common sense," says Crawford.



Today, Crawford is president of [Crawford Technologies Inc.](#), a leader in print-stream conversions, print stream and data mining, document re-engineering, archival and retrieval and mail processing solutions.

As an industry visionary, Crawford has a vast amount of knowledge and experience in the high volume transaction output (HVTO) industry, as well as in software development. He has over 23 years of experience with Xerox metacode, as well as AFP, PostScript, PDF and PCL print data streams. He also designed and handled the initial development of the PRO Suite of software, which transforms between different print formats, extracts data from print streams and allows users to enhance print streams on Windows, z/OS and UNIX and LINUX. The PRO Suite of software is currently marketed by IBM, LRS, EMC, Checkfree i-Solutions, Nearstar, Whitehill Technologies, ASE Technologies, Kern International and other companies. Crawford has shared his expertise by training many people on print streams over the years.

But how did it all begin?

Education & Hands-On Experience

When Crawford went to the Richard Ivey School of Business at the University of Western Ontario, he intended to take a degree in business management. However, coming from an entrepreneurial background, he found that he wasn't really learning anything new. "I felt I was not getting much value from my education." He then switched his focus to a computer science degree.

But it was that hands on experience in helping with the family businesses that helped Crawford gain a better understanding of how technology can benefit a company. "I was well primed to start a business of my own, but I needed a focus for it," says Crawford.

From the Big Corporate World

Prior to operating his first business, Crawford worked in the corporate world. "I started working as a mainframe Cobol programmer for an insurance company--- Canada Life---and then evolved to assembler programming at Sears, eventually to a senior MVS systems programmer at Hudson Bay Co.

For Crawford, the most valuable experience in these early days was helping build a new state-of-the-art data center and installing the first IBM 3800 model 3 printers in Canada. "Since these devices were the first AFP-compatible devices built, it gave me an advance exposure to the architecture that was due to revolutionize the HVTO market," says Crawford. "I also spent a lot of time making and maintaining modifications to JES2 in the days when its source code was available to customers. This gave me insight into the methods used in mainframe systems to manage application output."

Another interesting project that helped build Crawford's passion for this industry was rewriting a billing program. "The original program was so complex it took one analyst several months just to flowchart it. The rewrite successfully simplified the program, and it gave me a great appreciation of the complexities of creating invoices and bills programmatically."

Crawford joined Xerox Canada in the 1980s during the early days of the HVTO industry. "I built software development, technical support and marketing organizations. This gave me a very good insight into where the HVTO industry was headed, and many of the different aspects that make a successful vendor in this industry." During this time, Crawford was able to meet customers, vendors and Xerox professionals from around the world, and participate in establishing many solutions strategies.

While at Xerox Canada---during a time when electronic printing was still a fledgling business---Crawford took on the role of national technical manager, providing technical support to analysts and customers. He also provided marketing support to the Canadian sales organization, and participated in many Xerox worldwide product teams in El Segundo California.

"I built a software development lab in Canada where we built a number of products, some marketed around the world," recalls Crawford. "One interesting project was building a distributed font center, which was later used as a model for Xerox font centers around the world."

This developed into a strong insight into the HVTO market and a wealth of contacts in the industry around the world. "I was well primed to start a business in the HVTO industry," says Crawford.

Crawford left Xerox in 1987 to do consulting work in partnership with Art Parker and Romeyn Stevenson. "We provided a range of services to user and vendor organizations around the world. During this time I learned the secrets to being a successful consultant and developed many additional industry contacts."

Programming skills contributed to Crawford's early success. "The programming work gave me a good understanding of what is required to put together application software, such as billing and policy management systems," he says. "The systems programming work gave me an appreciation for how a mainframe environment is put together and how good program products should install and perform."

In Part Two of this "Entrepreneurial Spirit" series on Ernie Crawford EDP, learn how he used his background to launch Crawford Technologies, Inc., a leader in print-stream conversions, print stream and data mining, document re-engineering, archival and retrieval and mail processing solutions.

**Entrepreneurial Spirit:
Ernie Crawford EDP
President
[Crawford Technologies Inc.](#)**

***Part Two:
Building Crawford Technologies Inc., a Leading HVTO Company***

After his first 12 years in the high volume transaction output (HVTO) industry, Ernie Crawford EDP decided it was time to start his own company and develop and market software products.

Now, Crawford is president of the hugely successful [Crawford Technologies Inc.](#), a leader in print-stream conversions, print stream and data mining, document re-engineering, archival and retrieval and mail processing solutions.

But what led Crawford to start CrawfordTech? Surely his family's entrepreneurial background played a key role, as many of his relatives ran thriving businesses. Or, perhaps it was his educational background in computer science that inspired him. No matter what ignited the fire, Crawford knew he wanted to launch his own business while he was working on the development of conversion software components. "My decision to start CrawfordTech came after many of my clients and associates urged me to develop a complete print stream transformation software solution, saying that the market was not being well served by the small group of unfocused companies, each of which had its own problems," he says.



Crawford began to feel like he could succeed with a new business. "I had several software components ready for marketing, and a commitment from several customers and partners to buy and market the Xerox conversion software. This provided enough revenue to get started, and I had the sense to keep our costs low during the startup years to avoid a need for outside capital," Crawford explains.

During the startup, Crawford self-funded the business from his savings, earned from prior consulting engagements. He was then able to get mainframe development and testing time from one of his customers. After that, he generated enough revenue to finance growth, which was at times bolstered by consulting revenue.

To build the company, Crawford knew he needed a realistic business plan. "My goals when I began the company were fairly modest," he says. "I only wanted to generate a steady stream of revenue to keep me going when I was not doing consulting work. To do this, I wanted to bring the ProMeta technology to market to convert Xerox metacode and LCDS print streams into PCL and PDF, and provide an API for OEMs to use for outputting their own internal formats from Xerox print streams."

On the Rise

Crawford says it didn't take long before he was in business. "The conception to business start-up ensued very quickly as I had already developed many parts of the technology for clients under contract, and I was able to reuse this code. Also, I was able to use my consulting practice as a springboard which reduced the office setup time required," he says.



"When I was in previous support jobs, one of my pet peeves was calling a vendor for support, and reaching a Level 1 support representative who could do nothing more than take my name and number," Crawford explains. "When I started CrawfordTech, I decided that one of our key differentiators would be to have front line technical support people who have the ability to delve deep into customer problems on the first call, solving a high percentage of issues on the first call without a need for further escalation. Our customers often tell me that they feel we provide the best support in the industry."

For Crawford, the first few years were exciting as he watched his technology help companies meet their goals. He received a tremendous amount of positive feedback, which was encouraging during the beginning stages.

However, Crawford learned early on that one can burn-out easily while trying to do everything. This philosophy kept him level-headed and ready to build the business. "Life balance is very important," he says. "I have found that making time for my family and friends is very important. I focused on keeping the business profitable from the start, and resolved to grow more slowly. That approach eliminates financial stresses, which can be the worst. I make sure I get away often and do focused activities like skiing and scuba

diving where you need to let go of work and focus on fun things. When you are staring down a giant slalom race course, the only things that exist in the world are the gates between you and the finish line.”

Watch for Part Three of this “Entrepreneurial Spirit” series on Ernie Crawford EDP, and learn about the successes, challenges and triumphant moments of [Crawford Technologies, Inc.](#), a leader in print-stream conversions, print stream and data mining, document re-engineering, archival and retrieval and mail processing solutions.

Entrepreneurial Spirit:
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[Crawford Technologies Inc.](#)

Part Three:
CrawfordTech Powers Many Solutions Used by Global HVTO Users Today

Ernie Crawford EDP is a high volume transaction output (HVTO) expert, an entrepreneur, a complex technology thinker, and president of Crawford Technologies Inc. His company is a leader in print-stream conversions, print stream and data mining, document re-engineering, archival and retrieval and mail processing solutions.

For Crawford, there have been many triumphant moments in business. One of the most satisfying was winning a large contract with one of the largest print and electronic output outsourcers in North America with volumes near 100 billion pages per year. “We went up against nine incumbent competitors and after a lengthy evaluation, we came out on top, winning an enterprise license for key components of their core document archive, many different print stream transforms and our API which was used to integrate the solution together” he says.

Over the past 11 years, CrawfordTech’s software has helped power many of the solutions used by HVTO users around the world today. “We’ve been the go-to guys for people in search of challenging print stream manipulation and conversion solutions, and this has always ensured that we had plenty of projects to work on,” says Crawford. “As we grew, we needed to balance sales activity with new development activities and support organization growth. We always had to ensure that we could support our current customer base before taking on new projects, which people have always come to us with. At times we have had to turn down promising opportunities in order to ensure we would make no compromises to our current customer base.”



Crawford says his most challenging time in business was in the years after 9/11 when investment in HVTO solutions ground to a near halt, forcing his company to stretch its maintenance and consulting revenue until the market recovered. "Fortunately the market made a brilliant change, seemingly the day after the Iraq war was declared over," says Crawford. "During that period we made some investments in both marketing and development that hurt at the time, but as we had planned, resulted in giving us a very strong position later."

Crawford adds, "I always try to have contingency plans for anything that can go wrong, as Murphy says, 'If something can go wrong, it will,' and when it does, a good contingency plan lets you come out smelling like roses."

Patience & Perseverance

Crawford cites patience and perseverance as his most valuable assets. In addition, good planning and excellent customer service have been instrumental in guiding Crawford Technologies' success.

Having a good team has helped Crawford build his company from the ground up. "I look for people who can sort out what is important in any situation and let the irrelevant issues go by the wayside," says Crawford.

Indeed, it's Crawford's tendency to be patient and focus on building strong HVTO technology---rather than trying to achieve maximum revenue growth---which has resulted in a slow but extremely steady growth pattern for CrawfordTech. The company has a very strong base of technology to build on, and many organizations are taking advantage of that technology.

Crawford has continued to grow CrawfordTech by retaining existing customers and partners through adding requested functionality to existing products, keeping a sharp focus on providing world class after sale customer support and adding new products and solutions to his already robust offering while still keeping clearly focused on the HVTO industry. Over the last short period CrawfordTech has launched a print stream re-engineering product, some introductory workflow/management products as well as integration tools to pull the various offerings into robust end to end solutions.

"Another contributing factor to our success may be that, just when we think the print stream market is stable, someone comes along and invents a new print stream, leading to a plethora of opportunities for a company such as ours," he says.

Crawford shares that his company's customers select CrawfordTech solutions for various reasons. "One of them benchmarked our products against all of our competitors, and found that our fidelity success rate was more than four times that of some of our competitors," he says. "Another was using one of our competitor's products, but was finding that the product support was not up to the level they needed for their customers. Others find that our native support on all the key operating systems matches their need for complementary solutions on all those platforms. Two things they all love are the outstanding performance of our software, and the great response times they get from our awesome customer support organization."

In Part Four of this "Entrepreneurial Spirit" series on Ernie Crawford EDP, discover what's next from CrawfordTech's products and complex business solutions going in 2007 and beyond.

**Entrepreneurial Spirit:
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President
[Crawford Technologies Inc.](#)**

Part Four:

CrawfordTech Focuses on Business Solutions and Strong Customer/Partner Relationships

Ernie Crawford EDP is president of [Crawford Technologies Inc.](#), a leader in print-stream conversions, print stream and data mining, document re-engineering, archival and retrieval, and mail processing solutions. He's also a certified "Electronic Document Professional" and has presented at numerous conferences around the world.

Thanks to Crawford's entrepreneurial spirit, technology vision and passion for the high volume transaction output (HVTO) industry, Crawford Technologies' (CrawfordTech) complex solutions are imbedded in many of the major, industry vendors' products, or they stand alone as core infrastructure services in high-volume production environments.

As an entrepreneur and key player in the HVTO industry, Crawford finds many rewards. "I enjoy being able to explore new avenues and opportunities without worrying that a setback along the way will derail me," says Crawford. "I think this ability is what allows us, as a society, to achieve improvements, and I enjoy being an instrumental part of that. To see concepts move forward and become instrumental in our customers' business processes is very satisfying."



And, when faced with challenges, Crawford keeps a can-do attitude. "When people tell you something is impossible, ask them why, and note their answers," he says. "Then, after you have noted those potential barriers to success, develop plans to overcome them."

But while Crawford believes that the HVTO industry is far less glamorous than many careers, he says it is full of opportunity and satisfaction. "For me it has been an excellent choice that I have no regrets about," he says.

Solidifying Strong Partnerships

CrawfordTech works hard at building relationships with partners. The company listens to and understands what its customers need in order to add value to their offerings by embedding CrawfordTech's technology within their products. The

company also restructured its technology in a way that makes it easy to embed in a wide range of architectures on any platform. "We fully support our partners in all aspects of our business, from customer support to marketing, sales and administration," says Crawford.

Indeed, many of today's strategic companies in the document solutions business are distributors of CrawfordTech's PRO Suite of software solutions thanks to the robust software functionality and world class after sales support provided by CrawfordTech.

Then and Now

Originally, Crawford conceived his company as a smaller business without as much on its plate, but the company's goals have increased significantly---especially over the past five years---due to the success of its solutions in the marketplace and its strong financials. CrawfordTech has also made many positive moves---such as (1) building solid technology, (2) forging strong customer relationships, and (3) developing outstanding partnerships with top companies---which have helped CrawfordTech become a thriving leader in the industry. "These three 'legs' have allowed us to expand the scope of the organization significantly beyond what I had originally expected," says Crawford.



Chapter 1. On the Horizon:

A Bright Future for CrawfordTech

And what will the future look like for CrawfordTech? "I have this feeling that the next five years are going to be quite incredible," says Crawford. "In addition to the marketplace acceptance of our solutions, I am being approached with some interesting offers which demonstrate the benefits of achieving success and the opportunities that open up to those who have consistently attained their goals."

Crawford adds that his company now has opportunities to apply its strong base of technology to solving broader business problems, which have thus far not been solved. "For example, the capability of accurately extracting information out of print files can be used for many purposes, including: indexing, EBPP, XML creation, postal automation, ADF solutions, sorting, archiving and many more," says Crawford. "Being able to process all print stream formats in a common infrastructure and with a common API allows us to offer organizations with heterogeneous computing platforms the ability to implement a standardized methodology they can use with all applications that produce output. The opportunities that stem from this can be significant."

Looking at CrawfordTech even further down the road, Crawford says that he would like to apply his proven capabilities to successfully develop and deliver high-performance solutions to other disciplines. "In the short term, we have developed a superior solution for print data archival and retrieval, and I would like to see this become the industry de facto standard due to its flexibility, storage savings and high

performance," says Crawford.

But while success for CrawfordTech is a given, Crawford will also control his company's growth. He plans to keep a close eye on his business plan, find the best partners, and make sure that he brings the best possible people on board to help accomplish all of this. "Having excellent advice in the non HVTO-related areas such as legal and financial is critical to maintain strong business fundamentals, and we have always had strong advisors. Having developed many friends in the HVTO industry over the years, I have always had lots of industry people to bounce ideas and challenges off, and this has been very helpful in our successes."

Visionary, Complex Solutions Provider

According to Crawford, this is a key time in the HVTO industry for companies and individuals with vision to rise and show the marketplace the right directions. "There are a few companies that have risen in the past few years to provide that leadership, and I am proud that CrawfordTech is one of them," he says. "We have built a team of winners, and the solid foundation we have put in place will only be overshadowed by the future solutions we, our partners and customers, will build on top of them. Working with customers and partners to put building blocks in place can be extremely formidable and can empower many organizations to achieve their goals, over and over again."

With CrawfordTech's years of experience, products, tools, support systems and reputation, Ernie Crawford---a savvy entrepreneur and HVTO leader---has positioned his business as a premier solutions-focused company.

"We've already built many complex, successful solutions for large customers," says Crawford. "Now, expect to hear a lot more from us as we step up our marketing efforts and take our company to the next level."