

DEPARTMENT OF COMPUTER SCIENCE
University of Toronto

CSC 454S/2527S: THE BUSINESS OF SOFTWARE

MIDTERM EXAM: BOOKLET #2

26 February 2001, 6:10-7:10 p.m.

OPEN BOOK, OPEN COURSE NOTES

Write all your work on the first booklet (10 pages in total).
You will need to refer to this booklet (6 pages in total).

DO NOT HAND THIS BOOKLET IN.

Selected List of Guest Entrepreneurs

8 January

Ron Riesenbach is co-Founder and CEO of **Telepresence Systems, Inc.** (www.telepres.com), a consulting firm which provides project leadership and software development services to organizations building advanced electronic commerce and knowledge management systems. Riesenbach was previously Managing Director of the Ontario Telepresence Project. He has a MBA from the University of Toronto, is an alumnus of this course, and was a Guest Entrepreneur in Fall 1997.

22 January

David Abrams is Direct of Technology for **Perceptual Robotics, Inc.** (www.perceptualrobotics.com), in Evanston, Illinois, an application service provider offering TrueLook, the leading edge system for live visual telepresence. David was the first full-time hire at Perceptual Robotics, Inc. and has multiple patents pending in this area. He develops products for e-commerce, mass-audience webcasting (e.g. NBA Finals), 360-degree surround panoramas, collaborative imaging, and digital video. David was the top B.S. graduate from Northwestern University, has a M.Sc. in Computer Science from U of T, and is an alumnus of this course.

29 January

Prof. Mark Fox, the NSERC Industrial Research Chairholder in Enterprise Integration in the Department of Mechanical and Industrial Engineering, is founder of **Novator Systems** (www.novator.com), an e-retail software and services company specializing in e-retail shopping sites that build brand loyalty, maximize customer satisfaction, and operate under high demand conditions. He also founded and was President twice and VP of Engineering once of **Carnegie Group Inc. (CGI)**, which provided semi-custom solutions employing knowledge-based systems for engineering and management, and in the mid 80s was the only profitable AI company. CGI was taken public on NASDAQ in 1994, and acquired by Logica in 1998. He was a Guest Entrepreneur in Fall 1992.

12 February

William Tatham is CEO of **Janna Systems** (www.janna.com), a CRM systems company founded by him in 1990 and recently sold to **Siebel Systems** (www.siebel.com). Bill's vision, leadership, and understanding of the financial services industry propelled the company to a leading position in the eRM (Enterprise eBusiness Relationship Management) industry, where its solutions give organizations an enterprise information portal for client knowledge. Prior to founding Janna Systems in 1990, Bill was a senior manager in Andersen Consulting's Toronto office for the Advanced Technologies and Financial Services practices.

More from their Web Sites

Telepresence Systems, Inc.

Human-centred software engineering: Telepresence Systems, Inc., is an elite IT consulting firm which provides project leadership and software development services to organizations building advanced Electronic Commerce and Knowledge Management systems.

Perceptual Robotics, Inc.

Perceptual Robotics, Inc. (PRI) is an application service provider offering TrueLook, the leading edge system for live visual telepresence.

Novator Systems, Inc.

Successful e-Commerce with Novator. We're an innovative e-commerce service provider for the high-tech, retail, and financial industries. We have the experience, the expertise, and the solutions to turn your business into an online success.

Solutions. We'll help you build online relationships with your customers to increase your transaction conversion rate, maximize customer satisfaction, and increase customer loyalty to your company and its brands.

Janna Systems, Inc.

Siebel Systems has acquired Janna Systems, Inc. effective November 15, 2000.

Janna has been delivering tailored products and solutions for more than a decade into market-leading global financial services companies. Janna's eRM (Enterprise eBusiness Relationship Management) solutions give organizations an enterprise information portal for client knowledge. Janna's financial services solutions allow all customer interactions, whether via telephone, email, Web, face-to-face, or mail, to be captured in a database and accessed by customer-facing professionals across the enterprise.

With Janna, Siebel Systems will leverage and integrate technologies from two leading eRM solutions to offer its customers the most comprehensive and powerful multichannel eBusiness solution available for the financial services industry.

454S Winter 2000 Group 4: Med Mobility — EXECUTIVE SUMMARY

Med Mobility's mission is to capture 40% of market share in health record management by delivering productive electronic medical record systems to Canadian health institutes by the year 2004. This will be achieved through partnering with health facilities and hardware manufacturers to deliver integrated solutions including process consulting, electronic patient record system integration and user training and support. Our vision is to enhance the quality of healthcare service cost effectively. We will achieve this by implementing iHealth, a complete electronic patient record system, to improve the existing paper-based patient record systems in health institutes.

Med Mobility is focused in the CDN\$ 325 million IT market sector within the CDN\$ 11.6 billion Canadian healthcare industry. Its first clients will be hospitals and health institutes in Ontario. Due to funding cuts, Ontario hospitals need more cost-effective ways to lower their operating costs. Information handling currently accounts for 30-40% of health professional's activities. Existing paper based patient records are extremely ineffective, and are costing hospitals large amounts of money that can be saved by implementing electronic medical record systems. Combined with the maturing handheld and wireless technologies, Med Mobility will exploit this market niche to provide accurate point-of-care information retrieval and input systems to increase productivity of hospitals.

Med Mobility will deliver integrated solutions including process consulting, electronic medical record system integration and technical training and support. Our first major product, the iHealth system, can be customized to suit specific hospitals' needs. iHealth consists of wireless handheld devices, an electronic record database system, bundled with an easy-to-use user interface so that health professionals can retrieve and input patients' information effectively and efficiently. The user benefit of iHealth amounts to CDN\$3,36 million in cost savings per year for a hospital with 1000 beds, and that translates to a payback period of about eighteen months. We are currently collaborating with a health facility in Toronto to develop the iHealth solution, and we expect to complete implementation by the end of 2001.

After the first successful implementation, Med Mobility will grow rapidly to expand our client base. We will grow into a 183 people firm in 2004 with revenue over CDN \$46 million. We require an initial funding of CDN \$250,000, which will be rewarded with 30% per annum in capital gain in three years.

454S Winter 2000 Group 6: SOFTEX — EXECUTIVE SUMMARY

SOFTEX is a newly formed software development and publishing group, whose first offering is *artiFex*, a sophisticated high-end tool, for the digital enhancement and restoration of photographs, and film footage. *artiFex* is used for removing film grain noise from digitized photographs as well as motion picture frames. The types of noise processed include visible film grain, negative and print scratches, embedded dirt, and dust.

Our film grain reduction technique, based on Spectral Magnitude Subtraction (SMS), is superior to existing software and hardware currently available. A Master's Computer Science student at the University of Toronto developed the computer algorithm for this technique, after extensive research. Patent research has confirmed that the algorithm is indeed patentable. **SOFTEX** has acquired all rights to license and market the product from its developer. Moreover, research has demonstrated that a definite niche exists for such a product; in addition, we expect to be the first to bring to market a viable, high-end professional solution to this industry-wide problem.

The timeliness of this product has the potential of making *artiFex* a market winner. Society is sitting on a treasure trove of 100 years of film, 150 years of photographs, and 20 years of television (1945-1965) archived on film. The explosive proliferation of digital data and media, along with technological advancements in the fields of digital communications and processing, has resulted in a repositioning of analog content in a digital world. Analog content is being digitized, packaged, and made widely available in new digital formats. *artiFex* is a product, which solves a key problem in the drive to make existing analog media available in digital form. Specifically, it addresses the problem of improving the quality of existing analog content; such that, it will appeal to new generations of viewers who have become accustomed to expecting no less than the exceptional high quality of digital media.

We aim to target two important market segments with *artiFex*: stills photography and motion pictures. The photography market includes users who wish to digitally enhance photographs for personal or professional applications (desktop publishing and advertising). This market also includes commercial image banks, photographic studios and labs. The motion picture market includes commercial film studios whose vaults contain highly marketable properties, as well as film archive institutions, whose mandates are the restoration and preservation of film treasures. Also targeted are feature film producers, directors, and effects supervisors involved in film effects production; in addition, post-production facilities who are looking for technical solutions for their clients in these areas will buy our product. A wide spectrum of markets segments exist in this category (e.g. DVD, Web TV, and MPEG/JPEG), but the initial focus of this product will be towards the professional media market.

SOFTEX's mission is to establish *artiFex* as the de facto industry standard in the field of film degrading. Within one year, our initial release will offer *artiFex* as a plug-in to Adobe PhotoShop (there are six million such users) for the stills market, and to Adobe After-Effects for the film and video markets, in both Mac and Windows NT versions. Additional functionality in the form of scratch and dirt removal will be included in the initial release. We will simultaneously release the product for the high-end compositing, and effects software market including the discrete suite, Avid and Alias hosts. A year later, we will expand our offering to a full suite of film enhancement tools including flicker removal, and image stabilization.

We expect cumulative revenue in the US \$7.25 million range by the end of our fifth year, and we are looking for venture financing in the range of US \$700,000. We expect to provide a return on investment in the range of 39%, compounded annually over five years, adjusted for inflation.

Although newly formed, **SOFTEX** principals bring to the table the full range of skills to make this undertaking a success. Our backgrounds range from software engineering to digital signal processing, from film technology to video post-production, and from business administration to private investing. The developer from whom we are licensing the initial product has a proven track record in producing, and maintaining commercially successful plug-ins for Adobe After-Effects. Together, we are equipped to turn this opportunity into a market winner.

454S Winter 2000 Group 10: Mobile Parking — EXECUTIVE SUMMARY

Parking enforcement in many metropolitan centers relies heavily on pen-and-paper ticket issuance and manual data entry of information into legacy databases. Mobile Parking Incorporated (MPI) will provide parking agencies with a handheld device-based ticketing solution to improve parking agencies' processes. These devices will include a Global Positioning System (GPS) receiver and a digital camera to provide ticket officers with one-touch ticketing operation. The camera will perform license plate number recognition, while the GPS component will automatically determine the offending vehicle's street location. Ticket officers' tasks will be made more efficient as they will no longer need to enter information; everything will be automated.

The devices will also provide officers with vehicle information, such as the identification of stolen cars, to better perform their duties. Ticket information gathered by the devices will be synchronized with server-side legacy databases, thus removing the need for the manual entry of ticket information. MPI will be responsible for providing the complete solution, from device purchasing, software development, training, and integration.

The initial target market for MPI's product and services will be metropolitan centers in North America. These cities typically have populations of over 500,000 and annual revenues from parking tickets of at least \$10 million. Using MPI's solution, cities can expect to avoid 5 to 10 percent of lost revenue due to voided parking tickets. As an example, MPI can prevent the \$2.3 million annual loss incurred by the City of Toronto due to poor ticketing methods. MPI's solution will be priced at \$800,000, providing a city, similar in size to Toronto, with a payback period of 4 months.

MPI plans to employ debt financing measures in order to raise the capital needed to begin business operations. MPI requires an initial capitalization of \$240,000. This capitalization will be supplied through personal loans from MPI's four initial founders, where each founder will loan \$60,000.

MPI plans to be profitable by the end of its first year of operations. MPI's average projected growth rate over five years is estimated to be 128% year on year leading to a capitalization of over \$13 million dollars after five years. MPI also plans to grow its business into other vertical and foreign markets