**Career Pathways**

**Software Developer:** developers create user-facing applications, system software, mobile applications, and embedded software for various devices. They create user interfaces, manage databases, and oversee back-end processes. Front-end developers create user interfaces, while back-end developers create linkages between software and databases. The field is growing, with many potential applications yet to be built. Software developers are increasingly needed due to its increasing role in human work, requiring expertise in engineering or MIS, programming languages, and various tasks.

**IT Infrastructure & Network Administration:** large organizations buy, deploy, and maintain their IT infrastructure, including hardware, software, and networking components. They have an IT Infrastructure group to minimize downtime and maintain systems. Job roles include systems administrators, user managers, network managers, and email administrators.

**Cybersecurity:** cybersecurity experts protect organizations from hackers by monitoring threats, taking remedial action, and ensuring correct software versions. They train employees in security best practices, including end-user training and network monitoring. Cybersecurity roles share characteristics with IT infrastructure but require them to act under pressure when facing active threats.

**Data Science:** data science is a multidisciplinary field that utilizes scientific methods, processes, and systems from mathematics, statistics, artificial intelligence, and computer science to analyze and predict substantial amounts of data.

**Cloud Computing:** cloud computing provides services like servers, storage, databases, networking, software, analytics, and intelligence over the internet, enabling faster innovation, flexible resources, and economies of scale.

**IT Support:** IT support professionals provide technical assistance and maintain computer systems for organizations.IT support groups offer technical assistance for devices like computers, phones, and printers, interacting with end users and software developers. They include support staff, engineers, business analysts, and managers, with many university students working in this field.

**Data Management:** data management involves efficient storage, structuring, and retrieval of data for decision-making and strategic planning. Job roles include database administrators, data architects, modelers, and cloud specialists. New roles like data engineers and scientists are emerging, requiring a mix of programming and specialized skills.

**Computer Forensics:** computer forensics involves collecting and preserving evidence from computers for court presentation. It is crucial for police and investigators as computers are used in crime planning. Experts recover deleted files and track digital information, connecting criminals to crimes. Many police departments hire cybersecurity experts.

**Internet Infrastructure:** the rise in internet users and embedded devices presents both challenges and opportunities. By 2030, 7.5 billion people will be connected to the internet, and thirty billion devices and sensors will be connected to the Internet of Things (IoT). This network requires reliable internet connections and hardware, and IoT infrastructure technologists are in high demand, sharing characteristics with cybersecurity and IT infrastructure employees.

**Research and development:** As computing and networking become integrated into human life, research and development are crucial for simplifying, enhancing, and utilizing IT resources. This includes hardware, software, algorithms, and user interaction, driving IT growth and offering exciting work opportunities.

**Career Support IT:** IT career options include business analysts, user-interface designers, architects, engineering managers, quality assurance engineers, testers, and more. Even without an IT background, familiarity with technology is essential in modern jobs, such as teaching. Teachers must know email, online calendars, Excel, Google Cloud, and web conferencing technologies. Lessons from this book are relevant for any career.