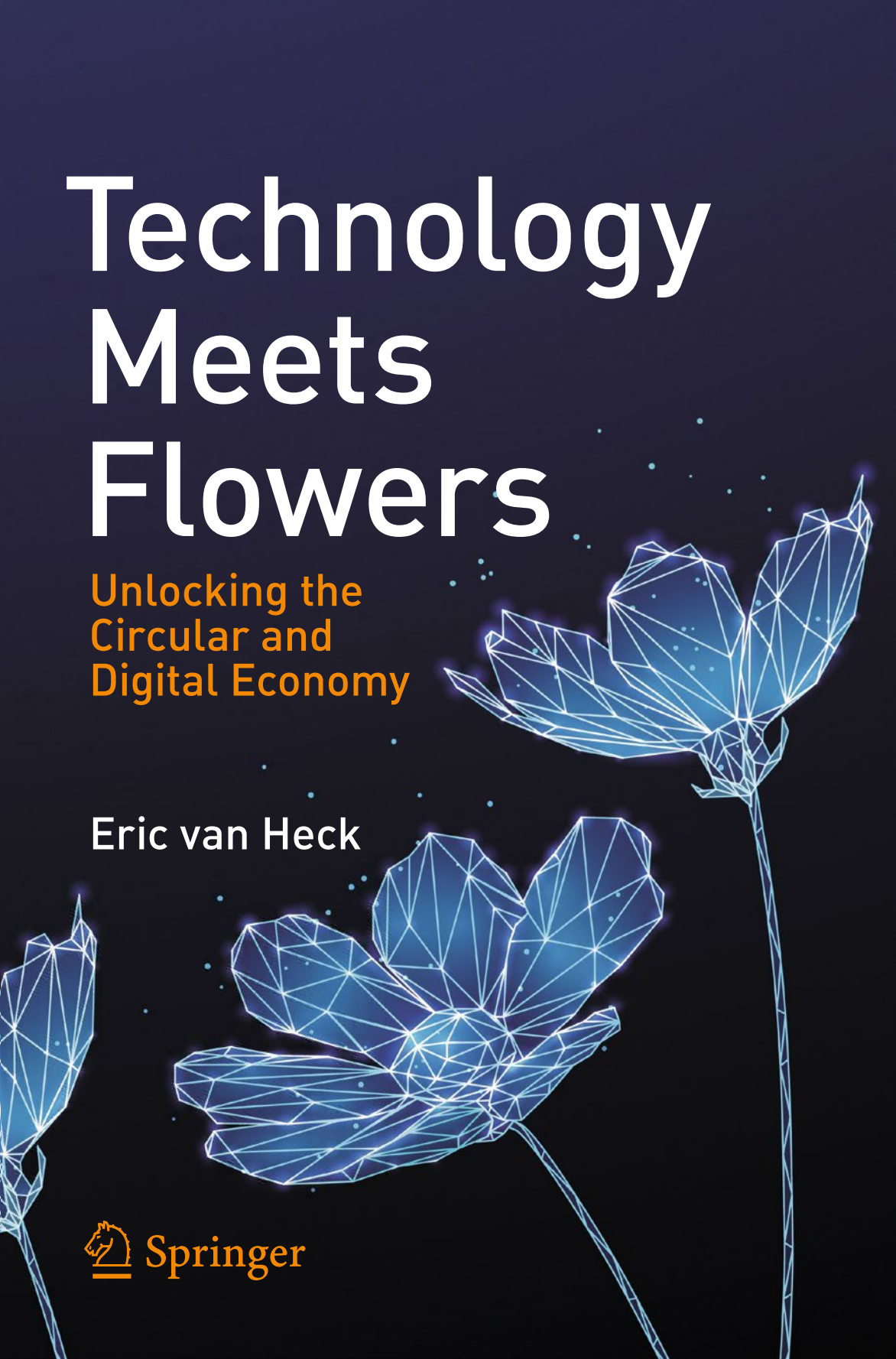
Technology Meets Flowers

Unlocking the Circular and Digital Economy

Eric van Heck



Springer

Technology Meets Flowers

Eric van Heck

Technology Meets Flowers

Unlocking the Circular and Digital Economy

Springer

Eric van Heck
Erasmus University Rotterdam
Rotterdam, The Netherlands

ISBN 978-3-030-69302-2 ISBN 978-3-030-69303-9 (eBook)
https://doi.org/10.1007/978-3-030-69303-9

This Springer imprint is published by the registered company Springer Nature Switzerland AG.
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

For Lia, Julia, Simon, and Maartje

Preface

As we buy flowers for our family and friends, we take for granted how flowers are produced and where they come from. Indeed, we expect that flowers can be ordered online anytime and anywhere. We assume that flowers will be delivered as fresh as possible even when produced on the other side of the world. The complex production and distribution challenges of perishable products are taken for granted. Actually, few people are fully aware that high-speed flower production and trade has taken the lead in blending technology with business.

This book tells the story of *Technology Meets Flowers*. It is a great story, almost a love story, which goes back to the Netherlands and the year 1593. It reveals the birth of the bulb and flower industry in that year, when a professor of botany was appointed at Leiden University. Developments in Dutch society around that time encouraged the needed entrepreneurial spirit and initiatives for flower production and trade, and there was enough money in the hands of citizens to support flower consumption. In the seventeenth century, flowers, especially tulips, became fashionable, next to paintings by Frans Hals, Rembrandt van Rijn, and other Dutch masters. Indeed, the story of Tulip Mania in the year 1637 is retold, and it is a very different story than what you may have heard before.

However, this book not only looks back at the origin of the flower industry. It also explores several inventions in later years, such as the first small glasshouses in 1680 and larger glasshouses around 1744, the Dutch auction concept in 1887, the electric auctioneer in 1903, and the flower grower cooperative in 1911. The blending of these technological, organizational, and market concepts accelerated flower production and trade. The European market for flowers was established in 1968 and led to the production of flowers for consumers

in other European countries. In 1975, standardized trolleys were introduced to speed up logistics and reduce transportation costs. The invention of the World Wide Web in 1989 created the architecture that would enable a new wave of electronic commerce and business. Electronic flower auctions were established in 1995 and showed the advantages of online pricing and trading. Web-based technologies connected flower supply with global flower demand, leading to a global market expansion. Mobile telephones and Internet connectivity fueled a mobile economy with more than five billion potential flower customers, some of whom will spend hours per day on their smart phones. Social media platforms, now with four billion active users, enable the exchange of digital images and videos and stimulate more demand and exchange. Nowadays, flowers are promoted by influencers and are popular social media content.

This is not a traditional management book for executives that describes the latest and state-of-the-art technologies and business models with examples of many different industries. Here we follow the story of one industry, the flower business and its markets, since its birth in 1593. The ups and downs and the struggles and triumphs that connected technology to business are presented and discussed. What is important here is that technology and innovation redefine the information frontier, and the frontier of achievement is extended further. Information derived from the information frontier is as perishable and time sensitive as flowers are. *Information advantage*, the value of having superior information, is a key driver for speeding up business processes in the flower business and its markets. Superior information, i.e., information that is new, fresh, and reliable, provides companies with an opportunity to win the competition in the business world. Emerging technologies provide companies with superior information, and companies can reap the benefits if they are able to blend technology with business concepts to fulfill latent customer demand.

Nowadays, modern glasshouses play a central role in the data-driven transformation of flower production. The exponential increase of computer technology, genetics, nanotechnology, robotics, and artificial intelligence contribute to a controlled production environment. Actually, you can view the flower industry as a living laboratory where these technologies are tested out. Automated and robotized glasshouses speed up production of flowers and offset carbon emissions, a welcome side effect in a world that is struggling with carbon emissions and their impact on the global climate. High-speed flower logistics with advanced distribution concepts that include last-mile distribution solutions and new ways of organizing transport and logistics to the end customer are critical because the freshness of short-lived flowers is fleeting.

Other businesses and markets can learn a lot from the production, commercial, logistical, and financial challenges of the flower business and the solutions that have been created within it. Entrepreneurs can learn about how to develop high-speed operations along the customer-driven value chain: from consumer need to flower seed. The use of digital technologies in different markets, such as media, health, transport and mobility, and food, has increased customers' expectations of fast service responses and product deliveries from the different actors in these value chains. These actors can learn from the flower business and markets and the double transformations that took place: the circular transformation and the digital transformation. Both transformations are creating a flower business that will stay within the ecological boundaries of the Earth.

Based on a solid analysis of how technologies were intertwined with the flower business and created sustainable value, this book provides lessons learned for leadership and guidance to unlock the circular and digital economy.

This book was written for four types of audience. Firstly, this book is for entrepreneurs working in the flower industry. They are eager to learn the underlying trends that will shape the transformations of the flower business and its markets, the potential value creation of emerging technologies, and the required circular and digital capabilities to reap the benefits of new business and markets. Secondly, this book is for entrepreneurs working in other sectors and industries. Many other sectors and industries are moving into customer-driven high-speed production and delivery operations. A reflection on lessons learned from the circular and digital transformations in the flower industry may help to create sustained success in other industries. Thirdly, this book is for a business school audience, both entrepreneurial executives and master's students. In my teaching at Erasmus University Rotterdam, in courses such as "Leading Transformation in the Digital Economy," "Leadership Challenges with Data Analytics," and "Digital Leadership and Change," the flower business examples and stories were always a source of inspiration and discussion, both for entrepreneurial executives and for master's students. Fourthly, this book is for anyone who may pick it up, enjoy its preface, and will start to read it.

For now, reader, you have enough information to continue reading this book. Join me on this journey and enjoy the reading!

Rotterdam, The Netherlands Eric van Heck

Acknowledgments

The idea of writing a book came up in the spring of 2019. After 4 years as chairman of the Department of Technology & Operations Management, I was happy to be accepted as visiting scholar at New York University. I am very grateful that my wife, Lia, joined me in this endeavor. Her love, happiness, and valuable feedback, also as the first reader of the draft manuscript, are a continuous source of inspiration. We were very happy that our children, Julia, Simon, and Maartje, were able to visit us while we were staying in the City, and for their eager interest in the progress of *Tulip Time*, as the book project was called among us. Thank you!

Many people helped me with the visiting scholarship and book project. Hereby I would like to thank them all. Just before heading to New York City, Otto Koppius suggested that I join the Master Class *Malcolm Gladwell Teaches Writing*. It turned out to be an excellent suggestion. I was inspired by Malcolm Gladwell's lectures on writing nonfiction for a general audience. Actually, *Technology Meets Flowers* is an extended version of a writing assignment I began working on for his class, i.e., to write a *New Yorker*-style nonfiction article. At NYU, Rohit Deo and Alex Tuzhilin, as the current and former department chair, welcomed me to the Department of Technology, Operations, and Statistics. Vasant Dhar was an excellent host. My neighbors in the department, Anindya Ghose and Mike Pinedo, helped me to feel at home. Elisabeth Greenberg, Germaine Germanese, and Maryann Zwaryczuk were very helpful in handling the complicated US side of the visa process and ably assisted me with other administrative issues.

During our stay in Manhattan, we were very grateful to catch up with Kimberly and Ajit Kambil. Ajit was my NYU host in 1994 and I am proud of what we achieved as we worked together, intensively researching the redesign

of the Dutch flower auctions. We were also fortunate to meet with our friends, Helen Shimbo and Jason Ware, for a great afternoon and evening in the City. We were very sad to learn that Helen passed away not long after in September 2019. We miss her dearly.

Many coauthors, coeditors, co-panelists, co-program chairs, senior editors, and (anonymous) associate editors and reviewers of conference papers and journal publications helped me to do the research and tell the story. I had very fine conversations about book writing or feedback on chapters with Eline van den Berg, Mayen Cunden, Magda David Hercheui, Eduardo Diniz, Nico van Hemert, Dré Kampfraath, Benn Konsynski, Martin Mocker, Joost Steins Bisschop, Tamilla Triantoro, Meditya Wasesa, Klaas Wassens, and Chen Zhang. Mary Ann Perkins was extremely helpful in editing the chapters and providing excellent suggestions to improve the storyline.

At Springer, Christian Rauscher, Prashanth Mahagaonkar, and Ruth Milewski were extremely helpful to guide me through the book editing and production process.

Technology Meets Flowers is based on research in the floral industry, in particular the "Auctioning with Advice" project sponsored by Royal FloraHolland and the "Artificial Intelligence in the Floriculture Chain" (iFlow) project sponsored by the Topsector Horticulture & Starting Materials, one of the nine top sectors of the Netherlands. I am very grateful to have led the iFlow project, which was an excellent collaboration with Eline van den Berg and Remco Wilting (Royal FloraHolland), Arjan van der Voort (Zentoo), Behzad Behdani, Jacqueline Bloemhof-Ruwaard †, Nguyen Quoc Viet, and Jack van der Vorst (Wageningen University & Research), Yixin Lu (George Washington University), Alok Gupta (University of Minnesota), and Huong May Truong and Wolf Ketter at RSM. Many conference breakfast sessions and research discussions over the years with Yixin, May, Alok, and Wolf led to very exciting research results and were an important source of inspiration for this book. In 2020, the impact of our work was recognized with the AIS Impact Award.

BIM master's students Stefan Bouts, Ronald Haring, Ricardo Prins, and Rick van Zijl contributed to the iFlow project through their thesis research. Tulsi Rakhan and Marcel van Oosterhout helped me to manage the iFlow budget and Irene Bosman created the iFlow video clip.

I am very grateful to be a member of the Business Information Management (BIM) group—a vibrant community with a world-class research and education portfolio. Research and education in the section inspired me a lot and my BIM colleagues voted for the best book title: Samaneh Bagheri, Rodrigo Belo, Tobias Brandt, Philipp Cornelius, Ayman Esmat, Yashar Ghiassi-Farrokhfal, Dominik Gutt, Els van de Kar, Jovana Karanovic, Wolf Ketter, Otto Koppius,

Yanick Kuper, Ting Li, Marcel van Oosterhout, Anna Priante, Gerrit Schipper, Haydee Sheombar, Aart Simons, Olga Slivko, Jeffrey Sweeney, Dimitrios Tsekouras, Peter Vervest, Markus Weinmann, Matthijs Wolters, Shengyun Yang, Dainis Zegners, and PhD candidates Ayman Abdelwahed, Mohammad Ansarin, Francesco Balocco, Ionannis Kanellopoulos, Agnieszka Kloc, Atabak Mehrdar, Ainara Novales, Joshua Paundra, Tamara Thuis, Huong May Truong, Charles Wan, and Zherui Yang.

At RSM, Theo Backx, Dirk van Dierendonck, Jan Dul, René de Koster, and Steef van de Velde encouraged me to go for a visiting scholarship. Cheryl Blok-Eiting, Carmen Meesters-Mirasol, Tineke van der Vhee, and Ingrid Waaijer helped me with the handling of the complicated NL side of the visa process. Ilse Lüschen and Lianne Speijer helped me with the format of the literature references and the book index.

The Wittenburg members missed my input during my time in New York City but, once back, were eager to discuss the highlights and downsides of NYC and the intriguing potential for a city of a hundred million people: Hans Abbink, Frans Copini, Nico van Hemert, Bernadette Janssen, Ton Laagland, Yung Lie, Iris Meerts, Haydee Sheombar, Floor van Spaendonck, Geerte Udo, and Siebren de Vries.

Field hockey friends were always eager to exchange jokes, pranks, and brilliant ideas: Albert Bos, Judith van Bossum, Eric Gaanderse, Monique Lander, Philip Lebbink, Tom Middendorp, Roy Osinga, Miguel Porfírio, Anne Tennekes, Petra Teunissen-de Wolf, Paul Veldhuijzen, and Gerald Wolf.

For 4 months, my rowing team at Royal Maas Yacht Club had to make do without this data-driven rower and were amazed by my once-in-a-lifetime rowing experience on the Hudson River: Brenda Brenninkmeijer, Chris van Calcar, Guus Enning, Coreille Harms, Nicoline van 't Hoff, Aeltsje Hylkema, Stephanie Leijten, Geert Meijer †, Eric van Niekerk, Thessa Noorman, Ronald Stuijfzand, and Roel van Woerden.

Friends were curious to learn about our adventures in New York City: Monique and Stan van Alphen, Wilma and Paul Gribnau, Lia Hof and Hans Bogerd, Huberdien and Pierre Hornikx, Caroline Lee and Julius van der Werf, Ingrid and Aad Jan Roos, Esther Steultjens, and Titus Nietsch. Patricia and Henk Ebeli took meticulous care of our home in Rotterdam while we were away.

Our family was not surprised that we went back to the City and were keen to hear our stories: Dorine and Jack Franken, Hilde van Heck and Geert Dirkse, Julia and Johan Jörissen, Gerdie Persoons, and Ans and Chris Wilbers.

Finally, I would like to thank my mother for her love and continuous support. My father passed away before this journey began, but he would have encouraged us to go back and stay in the City again.

The endeavor started with an empty page and magically a book was created out of it.

Eric van Heck

"What a captivating book! Eric van Heck juxtaposes two distinct histories: that of the iconic Dutch tulips dating back five centuries, and of digital technologies, considerably younger. The revolution triggered when these two elements collide has profound implications for the digital transformation of industries in general. A must-read for all interested in unraveling the impacts of ICT advances on society."

—Ritu Agarwal *Distinguished University Professor and Robert H. Smith Dean's Chair of Information Systems, Robert H. Smith School of Business, University of Maryland, College Park, USA*

"The flower industry proves that innovations, leadership, and long-term goals are in its DNA, which has given them a dominant market position. It is the perfect example for everyone working in the corporate world and in governments."

—Theo Backx *Executive in Residence, Rotterdam School of Management, Erasmus University, Rotterdam, Netherlands*

"*Technology Meets Flowers* is an engaging read about flowers, which play a major role in our social lives. Eric van Heck weaves in the increasing role of technology in the flower business, beginning with the engineering and genetic agricultural innovations that fueled the industry to the current day with digital platforms and auctions that are central to the industry. The stories are most engaging. I couldn't put it down once I started reading it."

—Vasant Dhar *Professor of Information Systems, Stern School of Business, New York University, New York City, USA*

"Combining the light beauty of flowers with the harsh language of the digital universe is a masterfully executed task in this book, organized as a bouquet of algorithms, data science, and digital platforms. Mandatory reading for all those interested in the

flower business as well as for those who want to know more about the perfume emanating from digital systems."

—Eduardo Diniz *Professor and Head of the Technology and Data Science Department, Escola de Administração de Empresas de São Paulo, Fundação Getulio Vargas, São Paulo, Brazil*

"Eric van Heck is one of the most enterprising academics who has an interest in addressing relevant questions of interest for businesses through academic research. This book provides a fascinating insight into the emerging role of analytics and business decision-making in traditional businesses. His work highlights Royal FloraHolland's innovative business model and its fascinating evolution of the last three decades, from making the auction clock electronic to the latest innovation with the introduction of pre-sales. Eric is one of the most prominent academic leaders in the field who has made this fascinating world visible to people outside the business through his academic writing as well as this book. I know the book will provide managers, students, business leaders, and academics a fascinating story and tremendous insights into innovating business processes."

—Alok Gupta *Senior Associate Dean and Curtis L. Carlson Schoolwide Chair in Information Management, Carlson School of Management, University of Minnesota, Minneapolis, USA*

"This book reveals the great historical journey of Dutch Horticulture. But in the heart there are guidelines for the great digital challenges of our times. Knowing and developing competences together, in meeting points like the World Horti Center, will create the digital horticultural agenda for enterprises, research, and education."

—Nico van Hemert *Managing Partner, Strategy On Demand, Leiden, Netherlands*

"This unique book leads you through the bulb fields and auctions of the Netherlands, through history, logistics, auction design, and Internet technology, to draw lessons in business management from the study of flowers. With beautiful illustrations. A tour de force."

—John Kay *Economist, Author of Radical Uncertainty and Greed is Dead, and Fellow, St. John's College, University of Oxford, Oxford, United Kingdom*

"In his vividly written book, Eric van Heck gently leads the reader into a rich understanding of the value—and pitfalls—of the high-speed world of digital management and 'perishable' data. Rather than explaining the concepts in a dry, management-school text, he explores the application of modern technologies in fast-moving commodities markets through the historical lens of the Netherland's most famous exports—flowers and collective auctions. A must-read for anyone mystified by terms like artificial intelligence and machine learning and anyone who loves a good story!"

—Wolfgang Ketter *Professor of Information Systems, Rotterdam School of Management, Erasmus University, Rotterdam, Netherlands, and University of Cologne, Cologne, Germany*

"If one wishes to understand the history and future of markets, you must go the master, Professor Eric van Heck. His book, *Technology Meets Flowers*, is a Master Class in market evolution and market possibilities in a digital age. I can think of no better market to study than the beautiful global flower market, no better center than the Dutch marketplace, and no better insight than the decades-long research by Professor van Heck. He offers a delightful and imaginative tour through the amazing history and digital transformation of this beautiful, delicate, and globally sourced treasure. The book offers a fascinating history, current innovations, and future possibilities for the global flower market and offers insight for any evolving market. For history, economics, strategy, operations, and competitive leverage of emerging technologies—I highly recommend Professor van Heck's Master Class in a book."

—Benn Konsynski *George S Craft Professor, Goizueta Business School, Emory University, Atlanta, USA*

"This is a marvelous book! While the primary focus is the evolution and transformation of the flower industry along with the technological innovation waves, it offers valuable insights to other information-rich and time-critical industry sectors. Highly recommended for anyone who is thinking about (re)inventing business in today's hyper-competitive digital economy."

—Yixin Lu *School of Business, George Washington University, Washington DC, USA*

"A must for anyone who wants to learn from one of the great business innovation success stories of recent times—the global flower ecosystem. A fascinating compilation of case studies on innovation and the successful introduction of new technologies including information, auctioneering, and biotech."

—Martijn van de Mandele *Senior Partner, Parma Group, Leiden, Netherlands. Senior Advisor, RAND Corporation, Brussels, Belgium. Advisory Board Member, Rotterdam School of Management, Erasmus University, Rotterdam, Netherlands*

"If you want to understand the impact of information and technology on a fascinating industry, this book is a must-read. The author explains in a highly intriguing way how innovations propelled the flower industry from the sixteenth century till today. Whether you are working in the flower industry, a business student, academic, or just intrigued by the business behind flowers, you will enjoy this book!"

—Martin Mocker *Professor of Information Systems, ESB Business School, Reutlingen University, Reutlingen, Germany. Research Affiliate, MIT Sloan Center for Information Systems Research, Cambridge, USA*

"Eric van Heck's book, *Technology Meets Flowers*, is a well-succeeded mix of a scientific treatise and a romantic novel. It provided me with some enlightening insights on the leverage of logistics on information, or the other way round: the leverage of information on the logistics in the flower market. Or how the impressive progress of technology will have an impact on organizational design. However, I'll have to add

one caveat, based on my experience. Whenever I pass by a flower market, I cannot stop thinking of this book."

—Joost Steins Bisschop *Partner, Jungle Minds, Amsterdam, Netherlands*

"Professor Eric van Heck provides great insight on how technology has been impacting floriculture. He puts developments in an historical perspective and describes where the industry is heading: algorithms and data-driven ecosystems will bloom. A very enjoyable 'must-read' on how the flower industry could be exemplary of where other industries are going."

—Pascal Visée *Non-executive Board Member of Royal FloraHolland, Aalsmeer, Netherlands. Non-executive Board Member of Rabobank Group, Utrecht, Netherlands*

"A must-read, if you want to understand the key success factors of the Dutch flower industry in its four centuries development toward the current data-driven, circular, collaborative, and orchestrated network. It clearly explains the power of new technologies and data science in all stages and aspects of the global network."

—Jack van der Vorst *Board Member of Wageningen University & Research and Professor in AgriFood Supply Chain Management, Wageningen, Netherlands*

Contents

About the Author

Eric van Heck is Professor of Information Management and Markets at Erasmus University Rotterdam. He is the coauthor of *Making Markets*, among other books and articles, and the recipient of the ERIM Book Award, the ERIM Impact Award, the Outstanding Paper Literati Network Award, and the AIS Best Conference Paper in IS Education Award. In 2020, he received the AIS Sandra Slaughter Service Award, the AIS Technology Challenge Award, and the AIS Impact Award. He lives in Rotterdam.

1

People Love Flowers

1.1 Tulip Time

Waves rolled and splashed toward the shore. The force of the tide broke on the beach. White stripes, indicating breaking waves, were visible all along the shore. From the airplane, the deserted beaches appeared magnificent but silent. The adjacent pale dunes shone almost white in the brilliant sunlight, dappled with sand oats and blue sea thistle, sturdy plants that could weather the sea salt and the sand. A village with small houses and farms with cows and horses was situated nearby, below the dunes and below sea level. More inland, the landscape flattened and was divided into large agricultural plots. Suddenly, colorful lines appeared in the plots: red, yellow, purple, orange, and white, looking somewhat like colored pencils lined up in a pencil box. It was tulip time in the Netherlands. Flowers were in full bloom on this sunny day in early May. Still farther inland, lakes appeared in the landscape, and the tall white sails of boats were mere dots on the bluish surface of the water. The serpentine waterfronts of these lakes contrasted sharply with the straight, long, and rectangular agricultural plots with their vibrant stripes of color. Between the plots there were small canals. From the airplane above, it looked like a very orderly quilt pattern, but it was not just beautiful. This design had allowed the Dutch to live on and cultivate land below sea level: where other people failed, the Dutch succeeded. The French writer, historian, and philosopher Voltaire was right when he quipped "God created the world, but the Dutch created the Netherlands." The airplane began its descent. Closer to Amsterdam, an area with glasshouses was visible. Sunlight reflected off the glass, creating diamond-white sparkles. The style of the glasshouses was almost industrial, with

E. van Heck, *Technology Meets Flowers*, https://doi.org/10.1007/978-3-030-69303-9_1

modern windmills and cylindrical water tanks. The plane made a slow turn to the left. A broad river flowed into a wide lake, with a small island situated in it, and just beyond the lake was the city center of Amsterdam.[1]

The central station, adjacent to the river, was clearly visible. The view from above revealed the orderly design of the city, characterized by concentric circles, like tree rings. Other features were also visible: a highway went under a waterway and bridges crossed canals. Descending further over the city, more sights came into view including countless houses and canals, a soccer stadium, a student complex of colored buildings, and many green parks. The pilot executed a perfect landing, touching down on time. We have arrived in the Netherlands, the starting point of a journey that will explore the history, the present, and the future of the flower markets. Let us go.

1.2 Seduction

People all over the world love flowers. Flowers are colorful and beautiful, and some are known and beloved for their fragrance. With bright colors and strong scents, flowers are a plant's utmost attempt to stand out and attract pollinators for fertilization. Flowers seduce. People enjoy giving and receiving flowers, which bring happiness to the giver and the receiver alike. Flowers are fragile and remind us of our own vulnerability as human beings: "How fragile we are" as the Sting song goes.[2] Flowers play a prominent role in the "critical moments of life".[3] When a baby is born, friends and family arrive with flowers in hand to welcome and admire the newborn, congratulate the family, and share in their happiness. Flowers are given to show thanks to teachers when a child finishes kindergarten. Every child in the Netherlands must pass a swimming exam, and flowers are given to celebrate this achievement. At the conclusion of sports tournaments, after intense competition, be it in soccer, tennis, hockey, cricket, or baseball, flowers commemorate the victory. Flowers are exchanged at the high school prom, and flowers are given to celebrate achievements and the progression toward the next phase of life. At high school graduation ceremonies, proud parents offer flowers to symbolize their feelings. Flowers communicate emotions that people are not able to communicate easily themselves. The next big event may be a university graduation or a marriage—both are days full of flowers. Throughout a lifetime, flowers appear at birthday celebrations and other special occasions. And at the end of life, flowers will be there as family and friends mourn their loved one. Flowers adorn graveyards and memorials around the world. We see flowers placed where the name of a victim is engraved on bronze parapets surrounding the

twin pools at the National September 11 Memorial in New York City. We see wreaths and flowers on the Tomb of the Unknown Soldier beneath the Arc de Triomphe in Paris or the "Bouquet of Tulips" sculpture, near the Petit Palais museum in Paris, made by Jeff Koons as a tribute to the victims of terrorist attacks at the Bataclan theater. We see the poppies people wear every year in the United Kingdom to commemorate the armistice and to remember those who died in World War One.[4] Poppies grew wild in many fields in northern France and Belgium, where some of the deadliest battles of World War One took place and many soldiers died. Poppies are tough flowers and can grow anywhere, but they are also delicate and a fitting emblem to remember those who died. Indeed, "the brief life of flowers" reminds us of our own short time on this Earth.[5]

Flowers are woven into many aspects of life. In many cultures, girls may be named for flowers, such as Daisy, Iris, Jasmin, Lily, or Rosa, and some flower varieties have been named after celebrities, such as the Marilyn Monroe rose, the Michelle Obama orchid, the Claude Monet rose, or the Franz Kafka dahlia. Every year, Saint Peter's Square in Rome is filled with Dutch flowers and plants during the *Urbi et Orbi* blessing by the Pope.

Around the world events and gatherings are organized to spread the joy and excitement of blooming flowers. Every year the return to spring is widely celebrated in Japan during cherry blossom season.[6] The Japanese have a word for it—*hanami*—that translates as "watching blossoms." It refers to the tradition of gathering beneath cherry blossom trees to picnic, drink, barbeque, spend time with friends and family, and enjoy watching the cherry blossoms. The *sakura*, as the cherry blossoms are known in Japan, start to bloom in Okinawa by January; they bloom in Kyoto and Tokyo at the end of March or beginning of April and proceed into areas at higher altitudes and northward, arriving in Hokkaido a few weeks later.

Spring is also celebrated at the Tulip Time Festival in Holland, Michigan, a town founded and largely inhabited by Dutch settlers. Its tulip festival is the largest in the United States with around five million planted tulips. The festivities include tulip parades, shows, concerts, and fireworks. Around the world, there are thousands of these festivals, among them the Portland Rose Festival in the United States, the Chelsea Flower Show in England, the Mangaung Rose Festival in South Africa, the Singapore Garden Festival, the Indonesian Tomohon International Flower Festival, the Hong Kong Flower Expo, the Melbourne International Flower and Garden Show, the Flowers Festival in Medellín, Colombia, and Expo Flora in Holambra, Brazil (a moniker formed by combining the first letters of Holland, America, and Brazil). In Zundert, the Netherlands, the largest flower parade of the world, Corso

Zundert, is held on the first Sunday of September. For over 80 years, 20 heralds compete against each other to build the most beautiful float. One float—nine meters high and 19 m long—can hold 500,000 dahlias and represent a mythical figure or action scene. And in Lisse, the Netherlands, Keukenhof can be visited, a park with 7 million spring-flowering bulbs, with a total of 800 varieties of tulips. Keukenhof, opened in 1950, is considered the most beautiful spring garden in the world; see Fig. 1.1.[7]

Next to receiving and giving flowers, or watching them blossom, many people also take great pleasure in gardening. Last year in December, I planted around 80 bulbs (snowdrops, tulips, daffodils, and common grape hyacinths) in my small garden and was delighted when the snowdrops appeared as the first sure sign of spring. England has an ideal climate for gardening, and it is among the top gardening countries in the world. Some have said that gardening is "the great British art," and the aesthetic of English country and cottage gardens is echoed in gardens in countries around the world.[8] Japan also has a culture of gardening, and Japanese Zen gardens are considered as places of meditation and reflection.[9] The Japanese stone garden has circular gravel figures, rocks, moss, small trees, and flowers. It reflects nature in harmony. I have visited the Ryoanji Temple Zen Garden in Kyoto, an excellent example of Japanese gardening that gave me a Zen experience and revealed the power of gardening to me in a new way.

Fig. 1.1 Keukenhof in Lisse, the most beautiful spring garden in the world. https://news.cision.com/keukenhof/i/200419llt8509,m23651. With permission by Keukenhof