

Janis Bubenko · John Krogstie
Oscar Pastor · Barbara Pernici
Colette Rolland · Arne Sølvberg *Eds.*

Seminal Contributions to Information Systems Engineering

25 Years of

CAiSE

 Springer

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Editors

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25 Years of CAiSE

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Preface

In 2013, the International Conference on Advance Information Systems Engineering (CAiSE) is turning 25. Started in 1989, in these years, the conference has provided a broad forum for researchers working in the area of Information Systems Engineering. To reflect on the work done so far and to examine perspectives of future work, the CAiSE Steering Committee decided to collect a selection of papers published in the conference proceedings in these years and to ask their authors, well-known researchers in the area, to comment on their work and how it developed during the years. CAiSE Proceedings have been published by Springer in the Lecture Notes in Computer Science Series (LNCS) since 1990. The editors of this book, who are the members of the Conference Advisory Board and the chairs of the Steering Committee, selected papers from CAiSE conferences from 1992 to 2008, to provide a broad overview on the topics that were presented and discussed in the conference and their evolution. The selection phase has not been easy, since many papers were well received in the research community and had a broad impact on future work. In the book, the original paper is reprinted, and after it, a short paper illustrating the evolution of the research related to the paper is included. As editors, we are thankful to the authors who accepted to participate in this adventure.

In addition, the book provides an overview on the conference from different points of view: a historical analysis on how it developed and its goals over the years, a social network analysis of the positioning of CAiSE in the research community, and future perspectives for the conference in an evolving world. As analyzed in these chapters, and as it is evident from the selected papers, the scope of the conference is broad but, at the same time, well positioned in an area which is related to the topics of modeling and designing information systems, collecting their requirements, but also with a special attention on how information systems are engineered, towards their final development as software components. Such focus has been consistently present in the development of the conference and in recent years. As such, the conference attracted over the years a larger and larger number of researchers, participating both in the conference and in its related events, such as workshops, related conferences, tutorials, and the Doctoral Consortium.

We think that as a whole the book provides a comprehensive overview of the research in this area and also provides many inspiring considerations for future work.

A very large number of people have to be thanked for their work in the CAiSE community in the last 25 years. It is impossible to mention everybody, but authors, reviewers, conference organizers and chairs, and organizers of related events all deserve our gratitude for their constant work in the community.

In particular, in the following, we would like to mention the editors of the CAiSE Proceedings, program chairs, and organizers, listing all conferences proceedings and the locations and countries in which the conferences were held:

- Jolita Ralyté, Xavier Franch, Sjaak Brinkkemper, Stanisław Wrycza (Eds.): *Advanced Information Systems Engineering – 24th International Conference, CAiSE 2012*, Gdansk, Poland, June 25–29, 2012, LNCS 7328, Springer, 2012
- Haralambos Mouratidis, Colette Rolland (Eds.): *Advanced Information Systems Engineering – 23rd International Conference, CAiSE 2011*, London, UK, June 20–24, 2011, LNCS 6741, Springer, 2011
- Barbara Pernici (Ed.): *Advanced Information Systems Engineering, 22nd International Conference, CAiSE 2010*, Hammamet, Tunisia, June 7–9, 2010, LNCS 6051, Springer, 2010
- Pascal van Eck, Jaap Gordijn, Roel Wieringa (Eds.): *Advanced Information Systems Engineering, 21st International Conference, CAiSE 2009*, Amsterdam, The Netherlands, June 8–12, 2009, LNCS 5565, Springer, 2009
- Zohra Bellahsene, Michel Léonard (Eds.): *Advanced Information Systems Engineering, 20th International Conference, CAiSE 2008*, Montpellier, France, June 16–20, 2008, LNCS 5074, Springer, 2008
- John Krogstie, Andreas L. Opdahl, Guttorm Sindre (Eds.): *Advanced Information Systems Engineering, 19th International Conference, CAiSE 2007*, Trondheim, Norway, June 11–15, 2007, LNCS 4495, Springer, 2007
- Eric Dubois, Klaus Pohl (Eds.): *Advanced Information Systems Engineering, 18th International Conference, CAiSE 2006*, Luxembourg, Luxembourg, June 5–9, 2006, LNCS 4001, Springer, 2006
- Oscar Pastor, João Falcão e Cunha (Eds.): *Advanced Information Systems Engineering, 17th International Conference, CAiSE 2005*, Porto, Portugal, June 13–17, 2005, LNCS 3520, Springer, 2005
- Anne Persson, Janis Stirna (Eds.): *Advanced Information Systems Engineering, 16th International Conference, CAiSE 2004*, Riga, Latvia, June 7–11, 2004, LNCS 3084, Springer, 2004
- Johann Eder, Michele Missikoff (Eds.): *Advanced Information Systems Engineering, 15th International Conference, CAiSE 2003*, Klagenfurt, Austria, June 16–18, 2003, LNCS 2681, Springer, 2003
- Anne Banks Pidduck, John Mylopoulos, Carson C. Woo, M. Tamer Özsu (Eds.): *Advanced Information Systems Engineering, 14th International Conference, CAiSE 2002*, Toronto, Canada, May 27–31, 2002, LNCS 2348, Springer, 2002

- Klaus R. Dittrich, Andreas Geppert, Moira C. Norrie (Eds.): *Advanced Information Systems Engineering*, 13th International Conference, CAiSE 2001, Interlaken, Switzerland, June 4–8, 2001, LNCS 2068, Springer, 2001
- Benkt Wangler, Lars Bergman (Eds.): *Advanced Information Systems Engineering*, 12th International Conference CAiSE 2000, Kista, Stockholm, Sweden, June 5–9, 2000, LNCS 1789, Springer, 2000
- Matthias Jarke, Andreas Oberweis (Eds.): *Advanced Information Systems Engineering*, 11th International Conference CAiSE'99, Heidelberg, Germany, June 14–18, 1999, LNCS 1626, Springer, 1999
- Barbara Pernici, Costantino Thanos (Eds.): *Advanced Information Systems Engineering*, 10th International Conference CAiSE'98, Pisa, Italy, June 8–12, 1998, LNCS 1413, Springer, 1998
- Antoni Olivé, Joan Antoni Pastor (Eds.): *Advanced Information Systems Engineering*, 9th International Conference, CAiSE'97, Barcelona, Catalonia, Spain, June 16–20, 1997, LNCS 1250, Springer, 1997
- Panos Constantopoulos, John Mylopoulos, Yannis Vassiliou (Eds.): *Advanced Information System Engineering*, 8th International Conference, CAiSE'96, Heraklion, Crete, Greece, May 20–24, 1996, LNCS 1080, Springer, 1996
- Juhani Iivari, Kalle Lyytinen, Matti Rossi (Eds.): *Advanced Information Systems Engineering*, 7th International Conference, CAiSE'95, Jyväskylä, Finland, June 12–16, 1995, LNCS 932, Springer, 1995
- Gerard Wijers, Sjaak Brinkkemper, Anthony I. Wasserman (Eds.): *Advanced Information Systems Engineering*, CAiSE'94, Utrecht, The Netherlands, June 6–10, 1994, LNCS 811, Springer, 1994
- Colette Rolland, François Bodart, Corine Cauvet (Eds.): *Advanced Information Systems Engineering*, CAiSE'93, Paris, France, June 8–11, 1993, LNCS 685, Springer, 1993
- Pericles Loucopoulos (Ed.): *Advanced Information Systems Engineering*, CAiSE'92, Manchester, UK, May 12–15, 1992, LNCS 593, Springer, 1992
- Rudolf Andersen, Janis A. Bubenko Jr., Arne Sølberg (Eds.): *Advanced Information Systems Engineering*, CAiSE'91, Trondheim, Norway, May 13–15, 1991, LNCS 498, Springer, 1991
- Bo Steinholtz, Arne Sølberg, Lars Bergman (Eds.): *Advanced Information Systems Engineering*, Second Nordic Conference CAiSE'90, Stockholm, Sweden, May 8–10, 1990, LNCS 436, Springer, 1990
- Janis Bubenko, Janis Stirna (Eds.) *The First Nordic Conference on Advanced Systems Engineering*, CASE89, Kista, Stockholm, Sweden, May 9–11, 1989, CEUR-WS Vol-961, 2013.

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The CAiSE Adventure

Janis Bubenko, Colette Rolland, and Arne Sølvsberg

Abstract What was to become a series of annual international, scientific conferences celebrating its 25th anniversary in 2013 came out of a modest, perhaps even an accidental start. The following gives an account of the early history of the CAiSE conference series, and of the considerations on setting up the organization and the guiding principles of the conferences. The first conference was arranged in Stockholm in May 1989 in Stockholm and was originally intended for a mixed audience of Nordic practitioners and scientists. Soon the conferences developed more into a meeting place for academic researchers, and have stayed as such for the remaining sequence of annual conferences up to this date.

1 Prelude

What was to become a series of annual international, scientific conferences celebrating its 25th anniversary in 2013 came out of a modest, perhaps even an accidental, start. The first conference was arranged in Stockholm in May 1989.

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The Swedish Institute for Systems Development¹ (SISU) in co-operation with the Swedish Society for Information Processing SSI organized it. The conference was called CASE – conference on Computer Aided Systems Engineering. The acronym CAiSE – Conference on Advanced Information Systems Engineering – came later, in 1990. The first conference was originally intended for a mixed audience of Nordic practitioners and scientists. Computer aided information system design was “in” at the time. Sweden was advanced both in practice and theory. Several CASE prototypes had been developed in the Nordic countries and had met with interest by practitioners. The IT department at KTH – The Royal Institute of Technology – was at the center of academic research of information system design theory and of methodological research. The department had educated a large number of students who had found good positions both in industry and in public administration. Janis had got the chair of Information Systems at KTH and had started the SYSLAB research group in the early 1980s. Arne and Colette had been in research cooperation with Janis for years, and were actively supporting this first conference.

The original plan was to create a meeting place for academics and practitioners. Researchers would be encouraged to present their findings to a mixed industrial/academic audience, and practitioners would be encouraged to challenge the research community in order to find solutions to their most pressing problems in designing and using information systems. The aim was to engage the two communities in discussions on practical problems of building real-world information system, from which both parties could emerge wiser. Janis, Colette and Arne were all participating in large international scientific and professional networks. They now called upon their colleagues in the international information systems research community to contribute. Several researchers from the Nordic countries, Europe and USA participated in the first 1989 conference.

2 Considerations in Forming the CAiSE Framework

The evaluation of the first conference indicated that one could hardly expect to have a continuous flow of a sufficient number of high-quality papers from the practical world lasting for many years unless going international on a much larger scale than in the Nordic countries alone. The reward mechanisms in industry for producing research type papers were deemed to be weaker than needed for guaranteeing sufficient local industry participation in such an endeavor. The question was how to achieve a framework that could survive.

The discussion about internationalization started prior to the first “CASE” conference. During the fall of 1989 Janis and Arne engaged in extensive email discussions on how to proceed after the first conference. Arne spent the academic year 1988–1989 on sabbatical leave in California while Janis stayed put in Stockholm

¹More information about SISU can be found at <http://www.sisuportal.se/> partly in Swedish.

building up the research institute SISU. The first CASE conference in 1989 also fitted well into the plans for establishing the research institute as an active player in the European research community. This was before the World Wide Web and Skype. The costs of travelling and telephone usage were high, so email was the preferred mode of communication.

We all had considerable experiences in arranging international conferences and workshops. We participated in extensive international networks of scientists in information systems, databases and software engineering. We had also recently become involved in EU sponsored projects under the Esprit 2 program. So we were fairly well placed to develop a new conference series.

In the following we present some considerations that lay behind establishing the CAiSE conference series.

2.1 Was There a Need for a New Conference Series?

Conferences that covered different parts of the relevant research fields were organized within several existing scientific communities. We were involved with three of them: IFIP Working Group 8.1 (WG8.1) for Information Systems, IFIP WG2.6 for Data Bases, the conference series VLDB (Very Large Data Bases) and to a lesser extent with the Entity-Relationship conference series.

The formal title of IFIP WG8.1 is “Design and evaluation of information systems”. It includes many aspects of IS use and design such as requirements analysis, modeling and description of IS, computer aided methods and tools for IS design, human-computer interaction design, as well as aligning information systems to organizations and organizational needs. IFIP Technical Committee TC8 on Information Systems was established in 1977. Arne and Colette were national representatives in TC8 representing Norway and France. The working group WG8.1 was established in 1977. Arne was chair of WG8.1 in the early 1980s (with Janis as secretary). Colette was member of WG8.1 from the start, and served as WG8.1 officer from 1988 to 1999. The essential output of an IFIP working group was working conferences within its scientific field. WG8.1 had a good record on working conferences, in particular the highly successful CRIS (Comparative Review of Information Systems Design Methodologies) that were arranged at Noordwijkerhout in The Netherlands. But IFIP 8.1 lacked an annual “sustainable” conference focusing on the field as a whole, or a subfield of Information Systems.

IFIP WG2.6 was at this time primarily concerned with issues of data semantics. While a useful and interesting topic, data semantics was not considered “central” to the field of Information Systems, at least not by us. Furthermore, a conference on data semantics would not draw many delegates to a conference. The theme was a bit narrow.

The first VLDB conference was arranged in Framingham, Massachusetts, in 1975. The conference may be considered as an academic response to a practical need, as expressed by government, business, and industry, a need to pay more

attention to approaches to organize, describe, store and search massive amounts of data, a problem of increasing importance for many practical applications. The “VLDB problem” is, of course, typical and essential for Information Systems, as databases are essential parts of any Information System. But the VLDB topic area seemed a bit too specialized for our purposes. We should also mention that our relationship to VLDB was excellent. All three of us presented papers at the VLDB conference in 1979. Both Arne and Janis were members of the VLDB Endowment. Janis chaired the Endowment 1989–1993. VLDB 1985 was organized in Stockholm and attended by about 800 delegates.

Peter Chen published his Entity-Relationship model in 1976. The first ER-conference was arranged in 1979 in Los Angeles and later developed into a series of conferences. In the beginning these conferences were almost totally focused on Chen’s ER model. At this time we thought this narrow focus to be too restricted to base a conference on. Later, of course, the thematic scope of the ER-conferences widened considerably, to the extent that the conference series later on changed name to International Conference on Conceptual Modeling.

Our conclusion about the situation was that none of the four groups could give us what we wanted. VLDB was in its main focus too far off the central issues of the field of Information Systems Engineering, although the main VLDB issues were very important, also for Information Systems Engineering. The Entity-Relationship conference was deemed to be too narrow, and too closely associated to data modeling of the Entity-Relationship variety. The organizational set-up of IFIP was deemed to be too closed, not being open enough to attract the young and up coming. There was no effective organizational mechanism for renewing membership in the governing bodies. The organizational philosophy as well as the bureaucracy of IFIP was simply not well suited to serve the rapidly evolving field of Information Technology.

In the end the choice was not so difficult: we decided to go for a new conference series provided that we could find an organizational set-up that had acceptable chances of success.

2.2 Was There a Sufficient Strong Research Basis That Could Be Tapped Into?

A primary concern was the availability of high quality papers. We had to associate the new conference series with major research groups. We had to encourage young PhD students to publish with us. Many of the relevant research groups were already active in IFIP, primarily in WG8.1. The WG8.1 approach was to arrange one or two working conferences each year inviting contributions within special topics within the central theme of information systems. This opened up for us to arrange an annual conference with a wider thematic coverage. We chose Information Systems Engineering to be the wider theme. We invited submissions from all research

areas relevant to this theme. By doing this we opened up a publication channel where researchers once a year could publish a continuity of new research results as their research projects matured and their PhD students developed their research from the idea stage to a more mature stage.

The research groups that were associated with WG8.1 and WG2.6 were deemed to be not enough to support a sustainable annual conference. We had to evaluate whether our international contact net could bring more international research groups into “the fold”. We found that a number of the research groups affiliated with VLDB also had strong activities in Information Systems Engineering, and were on the fringes of the VLDB central theme of very large data bases. A similar situation was found for the emerging ER-conferences. Many research groups were associated with several of the conference series.

Finally, Norway and Sweden had recently been permitted to participate in EU-sponsored research projects. Together with several other European research groups, we had been awarded a 5-year long ESPRIT II project, the TEMPORA project. This project could provide us with research results that could be published in future CAiSE conferences. The project also provided us with a better economic basis for pursuing the stabilization of a series of annual conferences. Other Esprit European projects of relevance to our planned conference came later, e.g., KIWIS (Advanced Knowledge-Based Environments for Database Systems) and F³ (F-cube – from Fuzzy to Formal – an endeavor in Requirements Engineering). Some of us were in these projects as well.

Our conclusion was that there was a sufficient strong research basis for supporting a new conference series. Last but not least, we could count on the research institute SISU together with their supporters (about 30 Swedish enterprises) to provide us an economic stability and guarantee for this kind of endeavor.

2.3 Location: Should We Go for a Regional Conference or a Global Conference?

A next issue was location. The four conference organizing communities mentioned above were in principle of a global nature. The Tempora project was strictly European. The two IFIP groups were in practice mostly European. The two conference series VLDB and ER were both initially US based, but expanded rapidly to have a global reach.

After some thinking we decided to go for a European conference. We considered that there were enough global conferences within the topic area. After all there was a limit to how many international travels a normal research group budget could accommodate. We considered it a safer choice to go for a European based conference series, but with a possibility to arrange CAiSE conferences outside of Europe if there were strong arguments for this. We gave ourselves the freedom to elevate non-European countries to a temporary classification of being European.

Because of the starting point of CAiSE being Nordic, we also permitted ourselves to build into the conference charter that future CAiSE conferences should be arranged in the Nordic countries from time to time.

2.4 Timing: Winter, Spring, Summer or Autumn Conference?

It was clear that if we were going international we were up for stiff competition on the selection of time slots. So we tried to avoid the times for other conferences with partly overlapping themes. We wanted to be both international and local. We wanted timing, which was suitable for the Nordic countries as well as for the rest of Europe and the USA. The spring or early summer was an obvious choice. Few places on earth are as attractive as the Nordic countries during late spring, late May and June.

2.5 How to Organize the Continuity of a Conference Series?

Aiming at creating a series of CAiSE conferences it was clear that we had to associate the conferences to an organizational body, which would exist in between conferences. Each individual conference would be set up with its own organization to prepare and operate the conference, and to be dissolved after the conference was over. But how should we organize the period in-between two conferences? What procedure to follow when choosing new conference sites? And – how should we deal with economical matters?

Most conferences at the time were associated with professional societies like IFIP, ACM and IEEE. A few were independent of the professional societies. They had created their own boards, which took the responsibility in-between conferences, like VLDB and the ER-conference.

Our experience from IFIP and VLDB was that we did not want to create an organization that had to handle money, provide seed money to the next conferences and things like that. Each conference and its economy should be the responsibility of its own organizing body. This meant that the organizer had to be prepared to take a larger risk than if leaning on a central organization. On the other hand, there was a good chance to make a profit because there was no profit sharing required with a central organization. Of course, the profit/loss statement had to be openly presented at each conference.

Initially, the organization and management of CAiSE was simple. There was to be an ever-extending steering expanding each year with two persons from the previous conference. Over time this led to a rather large steering group. There was a need for a smaller body to take day-to-day decisions without having to consult

too widely. So Arne, Janis and later also Colette formed an “advisory committee”. The advisory committee and the steering group had an informal “non-meeting” at each CAiSE conference. Matters like selecting future conference sites and publicity issues were handled there. This simple, informal scheme worked very well for many years, and was not changed until 2011 (see below).

2.6 How to Publish the Papers?

We were aiming at finding a rock solid publisher. It was very clear that there was no hope of creating a conference series unless we could find a trustworthy publisher. We all had good experience with Springer so this matter was easily decided. The cooperation with Springer went very well during all these years, very efficiently and in a friendly way. We are thankful to Springer for their very positive and reactive attitude to all our demands. We would like to take this opportunity to particularly thank Ralf Gerstner who has been our very supportive contact for many years including setting up this book proposal on a short time notice.

3 The First Conference

The first Conference on “Advanced Systems Engineering”, **CASE’89**, was arranged during May 9–11 1989, jointly by SISU (Swedish Institute for Systems Development) and SSI (Swedish Society for Information Processing, a member of IFIP). The conference was also supported by the research laboratory SYSLAB and DSV – the department of computer and systems science at Royal Institute of Technology and University of Stockholm. In fact the conference was called “The First Nordic conference ...” as our initial aim was to anchor this as a Nordic event. The economic risk and also the economic surplus were solely taken by SISU.

The main aim of CASE’89 was to bridge the gap between theory and practice in systems development. Consequently, CASE’89 was organised in two parallel streams, one more theoretical and one more practical. The theoretical track was traditionally organised by submitted, peer-reviewed, and accepted papers, primarily from researchers. The practical track consisted mainly of solicited, in some cases invited, talks from business, industry and the public sector. General conference co-chairpersons were Agneta Qwerin, Swedish Society for Information Processing, and Janis Bubenko Jr, the managing director of SISU. The executive Program Committee consisted of Björn Nilsson, SISU, chairman, Håkan Dahl, Christer Dahlgren, Kurt Gladh, Lars Swärd, and Örjan Odelhög. Lars Bergman, SISU, chaired the Organising Committee. As can be seen, the program committee was dominated by practitioners, all Swedish.

For our first conference we had to have well reputed keynote speakers to set the future direction: the CAiSE conferences were to become a high quality scientific conference series. The obvious choice for keynote speaker was Colette Rolland of Sorbonne. Colette has held the chair of the IFIP WG8.1, and her staff participated also in the Tempora, F3 and other EU projects. The three of us had similar ideas about Information Systems Engineering, and we started to work as a team for arranging the future CAiSE conferences. Colette later arranged the 1993 conference in Paris. The theme of Colette's invited talk was "On the future of modeling – why current CASE-tools insist on supporting 20 years old methods".² Indeed an intriguing topic: the idea was to be a bit provocative in addressing the prevalent view of CASE tools' vendors. The ISE community has, already in the 1970s, made the assumption that an information system captures some excerpt of world history and hence has concentrated on modelling information about the Universe of Discourse. This led to the conceptual modelling wave and the creation of a large number of semantically powerful conceptual models. The talk was arguing that CASE tools' editors should implement such rich modelling approaches instead of old-fashion structured analysis and design methods.

CASE'89 turned – a bit unexpectedly – out to be a success. A large number of contributed papers and international delegates could be noted. Forty-three papers were presented. The number of attending delegates was about 180.



The program chair of CASE'89, Dr. Björn Nilsson (deputy managing director of SISU) and the invited speaker, Professor Colette Rolland, University of Paris 1 (Photo by Janis Bubenko at the Riga, Latvia, CAiSE 2004)

²The two other invited speakers were Frans van Assche, James Martin Associates Co. and Simon Holloway, DCE, U.K. Frans's talk was "On the future of CASE tools". Simon's theme was "Organisational implications caused by the fourth generation environment",

4 The Following Conferences

We were now ready to organize our next CAiSE conference. We decided that the 1990 conference should take place in Stockholm, and the 1991 conference in Trondheim.

The success of CASE'89 gave us the courage to continue the CASE conference in a more international setting. The name of the 1990 conference was, however, changed to **CAiSE** (Conference on Advanced information Systems Engineering) in order not to be mixed up with another US-based conference, which had taken the CASE name. CAiSE'90 was also arranged in Stockholm by SISU and was supported by the department of Computer and Systems Science, the Royal Institute of Technology and Stockholm University (DSV). The general chair was Arne Sjølvberg, the program chair Bo Steinholtz (DSV), and the organising chair was Lars Bergman (SISU). All three were also co-editors of the first Springer Verlag (Lecture Notes in Computer Science) publication of the CAiSE'90 proceedings. About 200 delegates from more than 20 countries attended CAiSE'90. Our European colleagues expressed considerable interest to continue CAiSE on a European scale. Janis and Arne decided to support this challenge and worked out a few simple rules for CAiSE. Simply speaking, CAiSE was to be a conference with almost no rules. It was to have an expanding steering committee, which essentially consists of chairs of previous conferences. The organizing body of each CAiSE conference is responsible for the finances, profits as well as losses. About every fifth year it is expected that CAiSE returns to a Nordic country. CAiSE is guided by an advisory committee consisting of Colette Rolland, Janis Bubenko jr., and Arne Sjølvberg.

Since its start in 1989 and 1990 in Stockholm, CAiSE has been hosted in Norway (1991, 2007), U.K. (1992, 2011), France (1993), the Netherlands (1994, 2009),



The banquet of the 1997 CAiSE was celebrated at the Market Place designed by Gaudi at the Parc GULL in Barcelona. The attendance of CAiSE'97 was exceptionally good so the organisers decided we could afford this elegant setting and the outstanding menu

Finland (1995), Greece (1996), Catalonia (1997), Italy (1998), Germany (1999), Sweden (2000), Switzerland (2001), Canada (2002), Austria (2003), Latvia (2004), Portugal (2005), Luxembourg (2006), Tunisia (2010) and Poland (2012). The 25th event of CAiSE will be held in Valencia, 2013. Springer Verlag, Lecture Notes in Computer Science, has published all CAiSE proceedings, since 1990.

In our opinion the CAiSE series has been quite successful. Each conference has attracted between 200 and 300 submitted papers. About 40 of the submissions have been accepted for inclusion in the conference proceedings, giving an acceptance rate of 13–17 %. The attendance number has been 200 or more delegates. Papers in CAiSE proceedings have in general had good citation ratings.

5 Seminal Contributions of 25 Years of CAiSE

During these last 25 years, the CAiSE community shared the same broad view of information systems and the passion to develop advanced engineering solutions. On one hand, we all place an information system in a big picture in which ICT, socio-economic, organisational and business issues are intertwined. On the other hand, CAiSE research is part of design science but we clearly prefer to focus on the *design* side of it than on its *evaluation* dual part. The 17 seminal papers reedited in this book reflect these two key characteristics of CAiSE contributions.

The first CASE conference was held at the end of the conceptual modelling wave when providing an automated support to modelling became a key concern of CAiSE authors. The three papers on MetaEdit+ (*A fully configurable Multi-User & Multi-tool CASE and CAME environment*), OICSI (*A natural language approach for requirements engineering*) and OO-Method (*An OO software production environment combining conventional and formal methods*) introduced approaches (meta-modelling, natural language processing, and model transformations, respectively) that have still interest today.

This was also the time to go beyond the traditional way of engineering information systems through conceptual modelling. Whereas conceptual modelling allowed our community to understand the semantics of information and led to a large number of semantically powerful conceptual models, experience demonstrated that it failed in supporting the delivery of systems that were accepted by the community of their users. Indeed, a number of studies showed that systems failed due to an inadequate or insufficient understanding of the requirements they seek to address. To correct this situation, it was necessary to address the issue of requirements elicitation, validation, and specification in a relatively more focussed manner. The field of requirements engineering has emerged to meet this expectation. The hope was that as a result of this, more acceptable systems would be developed in the future. Three papers in this book address different aspects of requirements engineering: *The three dimensions of requirements engineering: a framework and its applications; Towards*

a deeper understanding of quality in requirements engineering; A requirements-driven development methodology.

Databases have always been part of CAiSE research (*Database schema matching using machine learning with feature selection; Data integration under integrity constraints*).

With time passing, new forms of information systems came into play. The CAiSE community paid a lot of attention in early 2000s to workflows (*Time constraints in workflow systems; Adaptive and dynamic service composition in eFlow; On structured workflow modelling; The P2P approach to inter-organizational workflows*) and to a less extent to data warehouses (*Architecture and quality in data warehouses*).

The CAiSE community has always been involved on the topic of methods, leading to the production of methods on one hand, but also contributing to understanding what a method is. It is thus, not surprising to note that the concept of Method Engineering was introduced by CAiSists (!) and further developed by a few groups in the world deeply involved with CAiSE and the EMMSAD workshop which each year was organized in conjunction with the main conference. Method engineering represents the effort to improve the usefulness of systems development methods by creating an adaptation framework whereby methods are created to match specific organisational situations. There are at least two objectives that can be associated to this adaptation. The first objective is the production of contingency methods, that is, situation-specific methods for certain types of organisational settings. This objective represents method engineering as the creation of a multiple choice setting. The second objective is one in which method engineering is used to produce method “on-the-fly”. Situational method engineering is the construction of methods, which are tuned to specific situations of development projects. Each system development starts then, with a method definition phase where the development method is constructed on the spot.

In recent years the CAiSE community has been involved with emerging concepts such as variability (*Automated reasoning on features models*).

Finally, the book reflects the considerable attention received in recent years by Business Process Management (BPM) and its fundamental concept of a business process. Process models may be used to configure information systems, but may also be used to analyze, understand, and improve the processes they describe. Hence, the introduction of BPM technology has both managerial and technical ramifications, and may enable significant productivity improvements, cost savings, and flow-time reductions. The practical relevance of BPM and rapid developments over the last decade justify the large number of highly cited BPM papers in the last CAiSE conferences (*Change patterns and change support features in process-aware information systems; Measuring similarity between process models; How much language is enough: Theoretical and practical use of business process modeling notation*).

6 Other Outcomes of CAiSE

Another interesting effect of CAiSE is its regular set of tutorials and workshops, normally arranged during 2 days preceding the conference itself. Some well-known workshops, such as EMMSAD (Evaluating Modelling Methods for Systems Analysis and Design) have been held every year since the start of CAiSE. EMMSAD was initially organised by Yair Wand of University of British Columbia, Canada. In fact, EMMSAD has evolved into being – informally – the “official” IFIP WG8.1 annual working conference. An official, annual WG8.1 business meeting follows each EMMSAD workshop. Other workshops, such as REFSQ (Requirements Engineering: Foundation for Software Quality) have evolved into independent conferences. Another such activity is POEM – Practice of Enterprise Modelling. One could say that POEM is a “spin-off” from EMMSAD and CAiSE activities and is now running as an independent conference.

Last but not least we should mention the doctoral consortium, which is organized at each CAiSE conference. Here young PhD candidates get the chance to present their early research results to experienced thesis advisors and to discuss their main findings and ideas.

7 The New CAiSE

In 2009 the young generation expressed thought exchanges on the Web, the wish to have a more controlled organisation of CAiSE conferences. Sensitive to this movement we proposed to set up a task force to make propositions about a new and more formalised CAiSE steering committee. Antoni Olivé accepted to chair this task force who presented its conclusions during the non-committee meeting of CAiSE 2010 in Tunisia. These were accepted, implemented during the year 2011 and finalized during the last non-committee meeting of CAiSE 2011 in London. The three nominated officers of the new Executive Steering Committee, namely Barbara Pernici, Oscar Pastor and John Krogstie took the lead at that time.

8 Singing at CAiSE

Singing eventually became a tradition at the CAiSE dinner banquets on Thursdays. We are not 100 % sure when it all started but already at CAiSE'92 at UMIST, Manchester, U.K. Keith Jeffery (of Ruherford Appleton Laboratories, RAL) had brought his guitar and accompanied some singing in the conference center bar. This somehow developed into an informal rule that the workshops, taking normally place during Mondays and Tuesdays, should prepare a “show” of singing and dancing to be presented at the workshop dinner. This idea was extremely well appreciated.

At the same time the advisory committee, then Janis and Arne also wanted to make a small contribution. Janis came up with the idea to perform a Danish drinking song (see below). We believe that some CAiSE delegated found it nice while others were more surprised and/or confused. In any case, after a while we found that the advisory committee had to be extended – we needed a “farmer’s wife” according to the text of the song. That is how Colette became the farmer’s wife in our little “show”. Arne played the farmer and Janis was the “young student”.

The song goes like this:

Han skulle gaa ud efter öl

(the translation is not guaranteed)

:/: Det var en go’ gammel bondemand
han skulde gaa ud efter öl.:/:
Han skulde gaa ud efter öl,
han skulde gaa ud efter öl,
efter öl, efter hoppersansa, trallallala
han skulde gaa ud efter öl.

There was a gentle old farmer

Who wanted to go out for a beer

:/: Till konen kom der en ung student
mens manden var ude efter öl.:/:
Mens manden var ude efter öl,
mens manden var ude efter öl,
efter öl, efter hoppersansa, trallallala
mens manden var ude efter öl.

*A young student came to his wife –
while the farmer was out for a beer*

:/: Han kyssed henne paa rosenmund
og klapped henne paa kind.:/:
Mens manden var ude efter öl,
mens manden var ude efter öl,
efter öl, efter hoppersansa, trallallala
mens manden var ude efter öl.

*He kissed her on her rosy mouth
and cuddled her on her chin*

while the farmer was out for a beer

:/: Men manden han stod bagved døren og saa
hvorledes det hele gik til.:/:
De troed’ han var ude efter öl,
de troed’ han var ude efter öl,
efter öl, efter hoppersansa, trallallala
de troed’ han var ude efter öl.

*But the farmer had been standing behind the door – he saw all what
did happen - while they thought he was out for a beer*

:/: Saa sköd han studenten och kaellingen med
og saa gik han ud efter öl.:/:
Og saa gik han ud efter öl,
og saa gik han ud efter öl,
efter öl, efter hoppersansa, trallallala
og saa gik han ud efter öl.

*So the farmer took his gun and shot the student as well as his wife –
and then he went out for a beer*

Og laer her af alle bondemaend
 nor I skal gaa ud efter öl.
 laas konen inog ta nöglen med
 nor I skal gaa ud efter öl.
 Nor I skal gaa ud efter öl,
 nor I skal gaa ud efter öl,
 efter öl, efter hoppansa, trallallala
 nor I skal gaa ud efter öl.

*So let this be a lesson to all of you who want to go out for a beer – first
 lock your wife up and bring the key along – when you go out for a beer*
 This last verse is perhaps a bit rude. There is another and better last verse:

Moralen er, ta din kone med,
 nor I skal gaa ud efter öl.

Etc., etc.

The morale is

Take your wife along

When you go out for a beer

Etc. etc.

Our recommendation is obvious: You should always bring your partner to CAiSE!



Authors of this book chapter performing the drinking song at the 2003 CAiSE in Klagenfurt/Velden, Austria

9 Conclusion

In conclusion we have had fantastic 25 years of CAiSE. We have had great fun not only technically and scientifically but also socially. We all have made many new friends and met dear old friends many times; we are happy CAiSE has managed to keep up its scientific and technical quality during all years. What more can we do than wish our followers at least 25 more years of successful international exchange.

Evolution of the CAiSE Author Community: A Social Network Analysis

Matthias Jarke, Manh Cuong Pham, and Ralf Klamma

Abstract The CAiSE community has always prided itself as more than just a normal conference – a successful social network with a very special culture. In this chapter, we apply formal social network analysis to study this community and its evolution of its first quarter-centennial of existence. Using a methodology and dataset developed for an analysis of Computer Science as a whole, we demonstrate the unusual positioning of CAiSE as a quasi-interdisciplinary conference between several sub-disciplines of Computer Science. We show that under an evolution model developed in our research CAiSE pursues a very successful and promising path, and we identify key topics and key players among the CAiSE authors. As the social network analysis focusses on formal aspects such as co-authorship and citations, we unfortunately must leave out one of the undoubtedly most critical success factors: the fun of being in the CAiSE community.

1 Introduction

The CAiSE community, as the community of other scientific conferences, can be considered as a community of practice (CoP) [13]. A community of practice is defined as “*a group of people who share a concern, a set of problem, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis*” [3]. CAiSE is a community of practice due to several aspects. First, members of CAiSE are working on a common research area, the Information Systems. Second, members are distributed across disciplines, which include information systems, database, requirement engineering, business process management, etc. Members are also distributed across organizations, cultures and

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geographical regions. Third, members communicate with each other via face-to-face conferences as well as technology-enhanced interaction. Finally, CAiSE attracts not only fundamental research, but also practical systems and architectures. That results in a very heterogeneous community where methods from different disciplines are used and practices are built on the basic and applied research.

In [12], we have developed a framework for analyzing the development of such scientific communities based on Social Network Analysis (SNA). The framework allows us to monitor the status of a community, qualify its development and compare its development pattern with other communities. It also enables the identification of key members and subgroups of the community. Different techniques are employed in this framework, including visualization, SNA ranking measures, and clustering techniques. Using the DBLP and CiteSeer databases as our data set, we applied this framework to the evolution of Computer Science as a whole. Moreover, we were able to show formally that a few leading computer science conferences are indeed equally important in terms of impact as the top journals in the field, which makes Computer Science quite different from many other disciplines where conference publications only play a marginal role.

In this chapter, we apply this framework to analyze the evolution of the CAiSE conference series. In particular, we are interested in the following questions:

- **Relationship with other communities:** what is the relationship between CAiSE and other communities in the field? What is the role of CAiSE to those communities?
- **Membership of CAiSE:** how do members come and stay in CAiSE? How is the community stabilized?
- **Connectivity:** how do members connect to each other? Does the connectivity grow over time? What is the pattern of the connections?
- **Topic analysis:** what topics are addressed by CAiSE community? How do topics connect to each other? who are the key researchers with the highest impact?

The rest of the chapter is organized as follows. In Sect. 2, we describe our analytical framework and the data we used in the analysis. Section 3 presents the results which aim to answer the above questions. The chapter finishes with a discussion and conclusion.

2 Methods and Data

Our general study of the evolution of digital libraries in general, and of computer science in particular [9] has resulted in a model to explain the community-building process, as well as the co-authoring and citation behavior in conferences and journals [12]. For example, a study of Technology Enhanced Learning research communities found interesting development patterns [11]. In this section, we describe this model and its underlying formal metrics as well as the data set we used for the analysis of CAiSE.

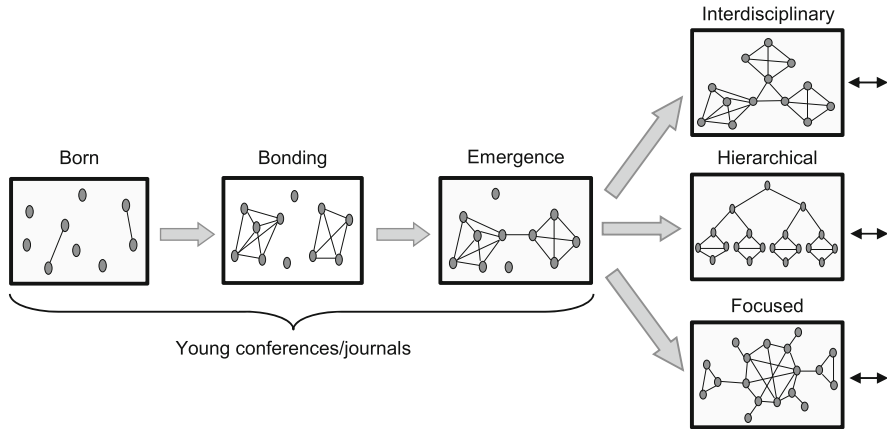


Fig. 1 The development model for scientific communities

Readers with a deeper methodological interest can also consult the Ph.D. thesis [10]. Moreover, an online version of the AERCS¹ analysis system by which the results in the thesis and in this paper were derived, is accessible for experimental use. AERCS does not just support the kind of long-term SNA we show in this paper, but also offers a component for mobile context-dependent advice to attendees of specific conferences.

2.1 The Development Model

Our basic evolution model depicted in Fig. 1 includes four stages: born, bonding, emergence, with the final stage being either interdisciplinary, hierarchical or focussed. Following earlier research in scientific community network analysis, the network employs two types of links: co-authorship and citation. The *co-authorship* subnet of a conference series consists of authors as nodes. There is an edge between two authors if they have co-authored at least one paper published in a conference event in that series. In the born phase, we typically find few connections between authors. After some events, author groups become apparent in the bonding phase. In the best case, they gradually integrated through joint publications from more than one group (emergence phase). Finally, successful conference series typically forms a network topology that features a strongly connected core group of authors that is connected to other smaller groups (*focused* topology). Alternatively, the co-authorship can develop into an interdisciplinary topology where several groups are connected via some gatekeepers, but where there is no core group. Or there

¹<http://bosch.informatik.rwth-aachen.de:5080/AERCS/>

might emerge a hierarchical topology which exposes some “super gatekeepers” who connect a hierarchy of groups.

Time series analysis. To quantitatively characterize the development process of a community according to this development model, we apply time series analysis on the networks to reveal six parameters over time: densification law, clustering coefficient, maximum betweenness, largest connected component, diameter, and average path length. These parameters enable us to explain the community building process in Fig. 1. To interpret the shape of the community, one needs to use a combination of all of these parameters.

Formally, given the network $G = (V, E)$, where V is the set of vertices or nodes, and E is the set of edges, these network metrics are defined as follows:

- *Densification law:* [4] discovered that complex networks densify over time, with the number of edges growing super-linearly with the number of nodes, meaning that the average degree (i.e., number of edges) of the nodes is increasing. The densification follows a power-law pattern: $e(t) \propto n(t)^\alpha$, where $e(t)$ and $n(t)$ are the number of edges and nodes at time t , respectively, and α is an exponent that lies between 1 and 2 ($\alpha = 1$ corresponds to constant average degree over time, while $\alpha = 2$ corresponds to very dense graph where on average each node has edges to a constant fraction of all nodes). We use this exponent to differentiate the “speed” by which networks are densified.
- The *clustering coefficient* of a network [6] is defined as the total number of pairs of vertices that have a common neighbor and are themselves connected, divided by the total number of pairs of vertices that have a common neighbor:

$$C = \frac{3 \times \text{number of triangles in the graph}}{\text{number of connected triples of vertices in the graph}} \quad (1)$$

Intuitively, during the born phase, the clustering coefficient is low, since nodes are unconnected with each other. In the bonding phase, the clustering coefficient tends to increase quickly as nodes are clustered into very dense, yet unconnected components. When the unconnected components subsequently start to connect with each other, the clustering coefficient drops and stays relatively stable after some time.

- *Betweenness* measures the extent to which a particular node lies between the other nodes in the network:

$$B(u) \equiv \sum_{u \neq i \neq j} \frac{\sigma^u(i, j)}{\sigma(i, j)} \quad (2)$$

where $\sigma(i, j)$ is the number of shortest-paths between nodes i and j , $\sigma^u(i, j)$ is the number of shortest-paths between i and j that pass through u . Nodes with high betweenness have more power to control the information flow in the