MEDLEMSBLAD

DATASAABs VÄNNER

Datasaabs Vänner - En ideell förening för datorhistoria och IT - utveckling

Spåren efter Datasaab.

Jag har just kommit hem från en bussresa till Budapest, en av europas vackraste städer. Resan genom Tyskland och Österrike tar två dar i anspråk så man hinner tänka många tankar och konsumera mycket godis och mineralvatten. Och vid uppehåll för att äta och sträcka på benen kan man inte undvika att titta runt bland folk som stannat till på samma ställe. Det skulle ju kunna slumpa sig så att någon gammal kollega råkade befinna sig just där. En fåvitsk tanke givetvis – men det får en i alla fall att tänka på gamla kollegor i det landet.

Tänk om gamle Edgar Eichler hade dykt upp! Edgar hade en livslång gärning i Facit och sen Datasaab och EIS. Alla perioder han tillbringat i Sverige för utbildning m.m. hade medfört att han pratade flytande svenska. Åtvidaberg kände han utan och innan – hur stor intellektuell kapacitet nu det kan ha krävt? Hans kunskaper i svenska gjorde att han ofta fick ta emot samtal från svenskar som inte behärskade tyska, även om det inte berörde hans verksamhetsområde. För mig blev Edgar en mycket god vän och den som bjöd på den godaste schweinshaxe jag nånsin ätit.

När vi närmade oss Wien dök skylten med Die Erste upp. Sparbanken som var vår kund. Och ser man ERSTE-logon kommer man osökt att se Peter Schiffler framför sig. Försäljaren som kunde anlägga det sorgsnaste ansiktsuttryck världen nånsin skådat och som han tog till när han ville att vi i Sverige skulle hjälpa till med rabbatter eller andra förmåner i de affärer han försökte få igenom. Sa man nej från HK och förklarade att det skulle göra affären till en förlust var hans favorituttryck: ”Du rührst mich zum tränen!” (Du rör mig till tårar). Och banne mig om man inte kunde se något fuktigt i ögonvrån också. Däremellan var han en glad och mycket angenäm person att umgås med – dessutom en duktig försäljare. Vilket gick åt på en marknad där vi inte tillhörde de stora och där kunderna inte hade en uppsjö av pengar att investera.

Att jag inte såg några spår efter oss i Budapest kan nog bero på att jag inte var involverad där och att det nu var längesen det begav sig. Budapest var ju Åsenius´ och Bengan Jonssons show, vilket vi fick en inblick i vid senaste årsmötet.

Men jag är alltså hemma igen och kan ägna mig åt våra påhitt här. Bl.a. ska en D23:a flyttas till IT-Ceums förråd och vi ska undersöka förutsättningarna att ge ut en del av Bits & Bytes på engelska. Du besöker väl vår hemsida och följer med vad som sig timar? Eller är du skeptisk till datorer? Kom då ihåg att de försörjt dig under längre eller kortare tid!

Lennart

Tur för Datasaabs Vänner.

Det var tur i flerfaldig betydelse den 14 maj 2003 med bussutflykt till Visingsö. Tur med vädret, tur med bussen, tur med hela resan, som inleddes av ordf. Lennart P. Han berikade oss både talandes och läsandes med kultur- historia och historiska vingslag från urminnes tider. Visingsö var ett politiskt centrum på 1500-talet, då kungarna ofta residerade på Näs, där även Arn satt sina fotspår enligt Jan Guillou.

För vår del började Visingsö-besöket med lunch bestående av mycket välsmakande Vättern-röding. Eller var det lax?

Mätta och belåtna började vi rundresan i Brahekyrkan, där vår guide introducerade oss på ett mycket förträffligt sätt. Han var kunnig, trevlig, saklig och även rolig när det behövdes.

Han var uppväxt på ön och hade varit bonde och visste nog det mesta. Brahekyrkan är ju pampig och minst sagt sevärd. (Vi hade också tur som inte blev uppmanade att gå upp i tornet. Det gjorde jag för ca 20 år sedan med ett barnbarn som pådrivare, men det gör jag aldrig om. Trappsteg i knähöjd är mitt minne och barnbarnet vågade inte gå ner, så jag fick bära det).

Vi fick lära oss om stormannagårdar och handelsplatser. Ön är ju mycket bördig – 70% är åkermark. Fram till 1600-talet var ön kalhuggen. 1832 började man plantera ek, detta förnäma båtvirke, med vilket svenska flottan skulle låta sina båtar byggas. Efter 10 år hade man planterat 300.000 ekar! I mitten på 1900-talet ville inte

längre försvaret ha några ekbåtar! Det var med ekvirket då som med datorer, PC och mobiltelefoner i våra dagar: när de kan köpas och användas då är de redan omoderna.

Vi fick en tur genom imponerande välskött skog och eken är ju nu eftertraktad för inredning och möbler. Vi åkte naturligtvis förbi Näs mm mm. Det var en kvalitativt förnämlig rundresa.

I Gränna åt vi polkagrisar på hemvägen . Och

framme i Linköping konstaterade vi, att resan inte bara gett oss kulturhistoria på ett trivsamt sätt, utan vi hade också tillfälle att påminna varandra om skrönor och glada minnen från vår arbetstid tillsammans. De kan väl kallas kul turhistorier. För mig var de det. Tack.

Ett Stort Tack till Rolf Hultqvist för arrangemanget och till Lennart för "hålligånget".

Gunde Sch f.d. ZDK

Weine om livet på BT sedan han slutade på Datasaab/EIS 1986.

När jag först blev tillfrågad om jag ville skriva något i Datasaabs Vänners medlemsblad om vad jag sysslat med efter tiden på Datasaab/EIS, var jag lite tveksam. Kan det verkligen vara intressant för mina gamla kollegor som i de flesta fall fortsatt inom det område som intresserar dem mest, nämligen datatekniken? Jag har ju jobbat med utrustning för materialhantering på BT Industries i Mjölby sedan 1986.

Efter viss eftertanke bestämde jag mig för att ändå försöka berätta något, trots allt har dessa drygt 16 år varit både intressanta och spännande på många sätt dock inte så mycket produkterna i sig som allt annat som måste till för en framgångsrik affärsutveckling. Som ni alla säkert vet går ju BT Industries riktigt bra och framtidsutsikterna är fortsatt ljusa i materialhanteringsbranschen.

Lite bakgrund om BT.

BT är fortfarande för allmänheten ett ganska anonymt företag som ofta, framför allt utomlands, förväxlas med bland andra British Telecom. Inom vår bransch är vi däremot numera välkända över hela världen.

BT grundades 1946 av KF (Kooperativa Förbundet) i Stockholm under namnet AB Byggekonomi, som 1948 blev Bygg - och Transportekonomi (BT). BT började som importör av amerikanska Clark motviktstruckar för att sedan utveckla en egen s.k. lyftvagn, den typ av manuell pallyftare som de flesta av oss någon gång provat.

BT flyttade 1951 till Mjölby och började utveckla elektriska truckar. I början av 60-talet byggdes en ny fabrik på den plats huvudfabriken fortfarande ligger. Under 60-talet växte företaget snabbt och började etablera dotterbolag i flera Europeiska länder. 1970 hade BT ca 1000 anställda, en siffra som 1980 växt till 3000.

70-och 80-talen präglades av ytterligare tillväxt och nya etableringar utomlands och BT blev ett av de ledande företagen inom området intern materialhantering. 1986 ändrades namnet till BT Industries AB och två år senare började en kraftfull satsning på Nordamerika genom två företagsförvärv.

Efter ett par turbulenta år kring 1990 stabiliserades företaget med en ny företagsledning. En rekonstruktion av BT

genomfördes som 1995 ledde till en börsintroduktion och KF's dominanta ägarskap upphörde därmed.

Under 90-talet växte BT till ett världsledande företag i branschen och genom ytterligare förvärv av ett av USA's största tillverkare av truckar, Raymond Corporation, nådde BT ca 20% av världsmarknaden. BT är idag, tillsammans med en av våra tyska konkurrenter, störst i världen på lagertruckar.

År 2000 förvärvade Toyota samtliga andelar i BT. Toyotas truckar, i huvudsak förutomhusbruk inom bygg - och tillverkningsindustrin och BT's truckar, främst för inomhusbruk i lager och distributionscentraler, kompletterar varandra på ett utmärkt sätt. BT's varumärke och försäljningskanaler bibehålls parallellt med Toyotas men en viss produktförsörjning mellan företagen sker.

BT är representerat i ett 70-tal länder över hela världen med egna dotterbolag i flertalet länder i Europa samt i Nordamerika. Utanför Europa sker försäljningen i de flesta fall genom fristående distributörer.

BT - koncernen har idag nära 8000 anställda och omsatte förra året drygt 12 miljarder kronor. Moderbolaget BT Industries AB, med säte i Mjölby är indelat i tre bolag, BT Europa för all verksamhet inom egna bolag i Europa, BT Raymond för Nordamerika och sedan 1998 BT International för övriga världen.

Mitt jobb på BT

Jag anställdes 1986 som produktchef för automatiska staplingskranar inom division Hanteringssystem, sedermera BT Systems AB.

Efter några månaders inkörning började jag vänja mig vid att BT som företag vid den här tidpunkten låg betydligt efter i utveckling jämfört med både Datasaab och Ericsson. Den feodala företagsstil som fanns på Saab 20 år tidigare och alla de problem med styrning av utländska dotterbolag som präglat Datasaab 10 år tidigare, fick jag återuppleva. Det är märk-ligt hur lite man lär av andras misstag eller drar nytta av andras erfarenhet. Tydligen måste misstag självupplevas.

I slutet av 80-talet gjordes en omfattande omorganisation och modernisering av företaget där man bl.a. flyttade ut verksamheten med automatiska kranar och truckar till ett separat bolag inom KF Industries. Det nya bolaget fick heta BT Systems AB och såldes efter några år till ett företag med säte i Schweiz. BT Industries skulle koncentrera sig på de traditionella manuella eldrivna truckarna.

Jag erbjöds fr.o.m. 1 februari 1989 ett jobb som regionchef för våra distributörsmarknader i Asien, främst fjärran östern och sydostasien. Någon visste att jag under några år på Ericsson jobbat med japaner (CAT-projektet) och trodde därför att detta var ett jobb för mig. BT hade redan vid den tidpunkten distributörer i flera av länderna bl. a i Japan.

En spännande tid började och efter de första besöken i fjärran östern under våren 1989 insåg jag att vad jag hade lärt om japaner inte alls stämde på kineser, koreaner, thailändare eller några av de andra folkslagen. Jag hävdar med bestämdhet, efter snart 20 år av täta kontakter, att japaner helt enkelt är annorlunda och skiljer sig markant även från andra asiatiska folk. Jag brukar ibland tycka att vi svenskar har mer gemensamt med t.ex. kineser och thailändare än vad de har med japaner. Jag skulle kunna ägna en lång stund till att beskriva alla märkliga och annorlunda upple-velser jag haft med japaner under mina mer än 30 besök i Japan men det ska jag inte göra. Jag vill bara peka på några egenheter hos japaner, de flesta mycket positiva. De är artiga, vänliga, ärliga och står för sitt ord. Omständliga och långsamma i beslutsprocessen och livrädda att göra bort sig och tappa ansiktet. Dock har de inga betänkligheter när det gäller att kopiera och stjäla ide'er, en profession de är världsmästare på, åtminstone så länge det gäller något de kan se

eller ta på. Nog om Japan och japaner, jag höll på att glömma att jag idag har en japansk arbetsgivare som jag hoppas ska försörja mig ytterligare ett år.

Under de första åren som regionchef blev jag tvungen att byta ut flera av distributörerna eftersom de utgjordes av s.k. handelshus, som i flertalet fall samlade på agenturer och inte hade något intresse av att bygga upp en för truckar nödvändig organisation, speciellt viktigt på servicesidan. Detta är ett absolut måste när man marknadsför produkter med ett stort innehåll av mekanik, hydraulik och elektronik. Här har jag naturligtvis haft nytta av alla år på Datasaabs serviceavdelning.

Under min tid som ansvarig för fjärran östern har mer än 10 nya distributörer etablerats, i flera fall i helt nya länder som t.ex. Korea, Kina och Indonesien. Att etablera en ny distributör kan ibland vara ganska tidskrävande, naturligtvis beroende på företagets tidigare erfarenhet inom materialhantering. Arbetet inleds med avtals - och prisförhand-lingar, fortsätter med produkt- , applikations- och serviceutbildning samt införande av nödvändiga arbetsrutiner. I ett fortvarighetstillstånd ägnas mycket tid till att följa upp budget och resultat samt besök hos kunder och ibland deltagande i större projekt.

Kommunikationen med samtliga distributörer i Asien sker på engelska, det enda västerländska språk de till nöds kan förstå. Affärs-diskussionerna och i de flest fall säljutbildningen kan oftast ske på engelska men för service-utbildningen krävs ofta en översättare. Försälj-ningen till slutkund sker nästan alltid på det lokala språket. Detta är en av anledningarna till varför BT valt att arbeta via oberoende distributörer. Ett annat skäl är att umgänget mellan säljare och kund ofta följer vedertagna mönster och traditioner som vi västerlänningar har svårt att förstå och ta till oss. Det är lätt att tappa en affär genom ett olämpligt, eller alltför västerländskt, beteende. Ytterligare ett skäl att använda distributörer istället för egna bolag är att det inte alltför sällan sker saker mellan köpare, ofta en anställd hos kunden, och distributör som man inte nödvändigtvis behöver känna till.

1993 öppnade BT ett lokalt kontor i Kuala-Lumpur för att stödja distributörerna i området. Kontoret bemannades med en svensk samt en lokal kines för teknisk support. Något år senare anställde vi även en kinesiska som administratör. Båda dessa kineser har gjort ett fantastiskt jobb och skaffat sig ett grundmurat gott anseende inom

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BT och arbetar fortfarande kvar i Kuala-Lumpur. Satsningen på ett regionalt supportkontor har visat sig lyckosamt och följts av ytterligare ett i Brasilien. Under senare delen av 90-talet släppte jag successivt ansvaret för länderna i fjärran östern och sydostasien till kontoret i Kuala-Lumpur för att istället kunna ägna mer tid åt mellanöstern. Jag har dock fortfarande två uppdrag kvar i fjärran östern. Det ena är ett styrelseuppdrag i vårt hälftenägda bolag i Thailand som vi startade 1997 just innan den ekonomiska kollapsen i regionen. Trots de svårigheter detta medförde har bolaget utvecklats från ca 15 personer till över 50 idag och med enmarknadsandel på drygt 40%. Efter alltid jag tillbringat i Thailand betraktar jag detta som mitt andra hemland, vänliga människor, god mat, bra klimat och billigt. Prova Thailand om ni inte gjort det. Det andra uppdraget är att flytta över BT-försäljningen i Japan från vår gamla distributör till Toyota. Ett naturligt steg eftersom Toyotas marknadsandel i Japan ligger nära 40% och BT's endast på någon %.

.Jag har även sedan 1989 haft ansvar för flera av distributörerna i mellanöstern. Tyvärr har inte tiden räckt till att ägna samma intresse åt dessa länder som för fjärran östern. Marknaderna är, med några få undantag, betydligt mindre och det har blivit en prioriteringsfråga. Sedan några år har jag dock kommit igång på allvar även i mellanöstern och även där har en del distributörer bytts ut och nya länder startats upp. BT finns nu i samtliga länder i mellanöstern, inklusive Israel, utom i Irak. Just nu lägger jag dock ner viss tid på att hitta en lämplig distributör i Irak eftersom behovet av truckar där förväntas bli stort redan under återuppbyggnadsskedet.

Under 90-talet gjordes ett antal riktigt stora affärer i Kuwait, Saudiarabien och Israel trots de hämningar i investeringsvilja som präglade marknaderna efter Iraks invasion i Kuwait 1990. Första gången jag besökte Kuwait var i augusti 1989, en het upplevelse eftersom temperaturen i skuggan nådde 52 grader. Det gick inte att vistas ute och att öppna en bildörr utan att bränna sig var omöjligt. För att undvika den värsta hettan och svedda fingrar lade jag därför nästa besök året därpå i juni. Oturligt nog nådde termometern exakt samma nivå även då men turligt nog hann jag undan för Saddam som i augusti invaderade Kuwait och förde alla västerlänningar till Bagdad där de fick stanna större delen av hösten.

Hösten 1991 åkte jag bil från Dahran i Saudi till Kuwait city, samma väg som de amerikanska trupperna tagit ett halvår tidigare när de jagat ut Saddam från Kuwait. Åtskilliga sönderskjutna stridsvagnar, lastbilar, broar, byggnader och nyligen släckta oljekällor kunde beskådas under den färden.

Ovannämnda tur med att inte vara på fel plats vid fel tidpunkt har faktiskt hänt vid flera tillfällen. Jag minns bl.a. ett besök i Manilla i början av 90-talet då det hotell jag bodde på veckan efter invaderades av gerillan och samtliga gäster hölls fångna en hel vecka. För övrigt samma hotell, Intercontinental, på vilket Viggo och jag delade rum efter en avbruten flygning mellan Manilla och Osaka 1984.

Tillbaka till mellanöstern, kulturellt och historiskt mycket intressant, med ett affärsklimat som i många avseenden skiljer sig från vårt i ännu högre grad än det i fjärran östern. Affärsavslut med araber tar tid och bygger ofta på förtroende för varandra vilket ibland kan ta år. Som tur är har flertalet företag utländska medarbetare som sköter mycket av kontakterna och affärerna med utlänningar. Många av BT's distributörer har antingen europeer eller indier i ledande befattningar vilket underlättar. Kunderna är naturligtvis i flertalet fall inhemska och mycket typiskt för araber är att när de slutligen bestämt sig för att t. ex. köpa något så har de väldigt svårt att acceptera normala leveranstider, allt ska ske på stört.

Jag har som ni förstår haft flera intressanta jobb på BT men detta som regionchef för många skilda länder i Asien och tidvis även sydeuropa har varit det mest inspirerande och roliga. Inte bara jobbet i sig utan alla trevliga och intressanta människor man träffat, olika kulturer och religioner man lärt känna och spännande händelser man fått uppleva har gjort att dessa år på BT gått väldigt fort. Jag minns mycket väl hur jag i början saknade arbetskamraterna på Datasaab/EIS och att jag vid mer än ett tillfälle på morgonen svängde vänster mot Linköping och fick vända efter någon kilometer när verkligheten hunnit ifatt mig. Människan är anpassningsbar och man vänjer sig ganska fort vid nya förhållanden, även jag som hade nått 47 års ålder när jag bytte bana.

Vikingstad sommaren 2003,
Weine Bernfordt

History of Nordic Computing

Den 15-17 juni hölls en konferens i Trondheim med rubricerade titel. Avsikten var att belysa hur datorer och databehandling introducerades och utvecklades i de nordiska länderna under 1950-talet och några decennier framåt.

Datasaabs Vänner deltog med två föredrag

Bengt Asker: Algol-Genius, an early success for high level languages
Viggo Wentzel: Automatic Teller Machines, a Datasaab project in 1970-1985

Båda föredragen kommer att publiceras i medlemsbladet.

Föreningens böcker "Bits & Bytes ur Datasaabs historia" samt medlemsbladet fanns utställda i konferenslokalen

Konferensen samlade ett 70-tal deltagare, såväl "old timers" som forskare inom området vetenskapshistoria. Börje Langefors höll öppningsanförandet.

Följande områden behandlades:

- Early Computing
- Establishing computing education and research in Nordic universities
- Nordic Cooperation
- Nordic Computer industry
- Education
- Programming languages
- Technical developments
- Early hardware and software
- System development
- Significant applications
- Computer Networking
- Political and Social Development
- Regional developments

Dokumentation av föredragen finns hos undertecknad

Viggo Wentzel

Algol-Genius, an early success for high level languages

by Bengt Asker

Abstract. Algol-Genius, an Algol 60 implementation with features from COBOL, was the brain-child of Börje Langefors. In 1964, assembler was the dominant programming language, but Algol-Genius broke that trend among Datasaab D21 customers. Algol-Genius programs were still in production in the late nineties

Introduction

The main topic of this paper is the programming language Algol-Genius. Since the history of the first Datasaab computers, D21 and D22 is not represented at this conference, I will place Algol-Genius in the context of Datasaab's early history.

How Datasaab was born

Saab was one of the first organizations in Sweden to use computers on a large scale. Aircraft design required extensive computing. Initially this was done by ladies at desk calculators. Börje Langefors pioneered the of use punch card machines for matrix calculations. When Besk became available, Saab was one of the heavy users and soon built a copy, called Sara. These efforts meant that Saab early on acquired competence in software development. On a parallel line, in other parts of Saab, Viggo Wentzel designed a transistorized digital computer, aiming at an airborne version. The result was a prototype, one of the first transistorized computers in the world, called D2, which was demonstrated to the Swedish air force in 1960. It was a desktop computer, in fact it covered the entire desktop.

Saab had made several attempts to diversify from a total dependence on military products. Now it could use this unique combined expertise in hardware and software to launch a commercial computer, the D21. Gunnar Lindström was the typical entrepreneur heading the division. Quite naturally Viggo Wentzel took care of the hardware and Börje Langefors the software. Saab's CEO Tryggve Holm, one the last patriarchs, said in a speech to prospective customers: "We woke up one day at Saab and found that we made computers"

The D2 desktop computer

The first customer was Skandinaviska Elverk, not surprising since Gunnar Lindström came to Saab from the power utility sector. The first order has become quite famous, it is a three line letter, dated 14 December 1960, ordering a computer according to the offer so and so.

Datasaab D21

Hardware

The first D21 was delivered in 1962. It was a very competitive computer for its time. Maximum primary storage was 32 k words (96 kb) with a cycle time of 4.8 µs, addition of two 24 bit integers took 9.6 µs. Secondary storage was tape, an inventive construction which originally was developed for Sara with the appropriate name Saraband. Based on a suggestion from Börje Langefors the designer, Kurt Widin, invented a coding, which he later found out was called a Hamming code, that corrected one bit and detected two bit errors. Searching for a block, reading and writing went on in parallel with processes in the CPU. This was a novelty in that price class and contributed strongly to the excellent performance of D21. Basic input and output was, in conformance with the Nordic tradition, punched tape, with a very fast tape reader from Regnesentralen.

Since D2 was designed for process control it had an interrupt function which was carried over to D21.

Market

The computer was a reasonable success. In all 32 were manufactured, mostly sold in Scandinavia, a few also in Czechoslovakia and Hungary. Some early customers after Skandinaviska Elverk were Gothenburg University, Slakteriförbundet, Kockums shipyard, Volvo Flygmotor, Allmänna Brand (insurance), Saab and SMHI (weather forecasts). An interesting mixture which shows that D21 was a truly general computer. All of them, with the exception of SMHI and Gothenburg University, who both had extremely demanding computations, used Algol-Genius extensively.

   The biggest order came from the county governments (Länsstyrelserna). At first the order for some 20 computer went to IBM and 360/30. After heavy lobbying the decision was changed so that IBM only got half of the orders and Datasaab the other half. Since the two computer brands were incompatible in every respect this meant two parallel software development efforts for Länsstyrelserna. Today unthinkable but at that time not a unique compromise. The computers were delivered in 1963-1966, but in 1969 the parliament decided that the IBM computers should be exchanged to D21s, because of the superior performance of the later, mainly in sorting. In the end, eight D21 and seven D220 were delivered. Länsstyrelserna did not use Algol-Genius for two reasons: Application development started before the compiler was available and the computers had a very squeezed memory.
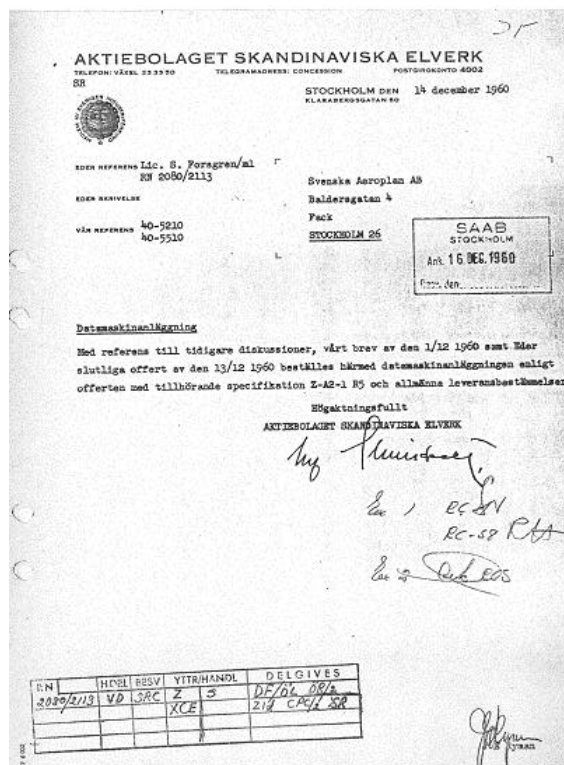
The first D21 contract

Other software than Algol-Genius

The interrupts in D21 were never used for true multiprocessing, only to run I/O in parallel with computing. So the "operating system" occupied a tiny 1024 words in primary memory. In addition "Dirigenten" (The conductor) translated job control statements into a very compact representation and proved to be very efficient and flexible.

The assembler was called DAC. As a protest against the very stereotyped punched card tradition it sported a free format, used capital and small letters and + instead of ADD, C+ for LOAD etc.

D21 excelled in sorting. The tape system with parallelism and the comparatively big memory contributed of course, but also the advanced sorting algorithms used. At this time Donald Knuth and others had just published their pioneering research and Åke Fager did a great job in implementing the results for D21.

Algol-Genius

Accidental problems

Fred Brooks' "The mythical man-month" was first published in 1975. It is based on his experience as a project manager for IBM's OS/360. "The mythical man-month" is mandatory reading for anyone interested in computer history and is now available in a new edition which also contains "No Silver Bullet". In this essay Brooks divides the difficulties in software design in essential and accidental. His point is that we will never find the silver bullet that kills the essential difficulties but that we have made great progress eliminating the accidental. One example of essential problems is the inherent complexity "software entities are more complex for their size than perhaps any other human construct, because no two parts are alike". Another is the necessity to conform to and implement rules and regulations "forced without rhyme and reason by the many human institutions and systems to which his interfaces must conform." Accidental problems are those that are inherent in the "machine programs concerned with bits, registers, conditions…". The first step to eliminate the accidental problems was assemblers, then came the problem oriented lnguages with Fortran leading the way.

Algol and of course Algol-Genius came soon after. I would claim that Algol-Genius went as far as you could reasonably go to eliminate the accidental problems with the machine resources then available. Today's software world with the web, distributed components etcetera requires much more powerful tools, but that is another story, which I will get back to. The essential problems we still have to live with!

The first version

In 1962 the dominating language for business data processing was assembler, in particular in the IBM world. Börje Langefors was convinced that high level languages could and should be used. Algol 60 was already well established at that time and the first version of Cobol was defined. Since D21 had no decimal arithmetic it was judged that performance in a Cobol implementation would not be acceptable. The decision to choose Algol was supported by the fact that the first Cobol was not a good programming language. It had a very primitive procedure concept with no parameters, all variables were global, and it featured some dangerous constructs like COMPUTED GO TO and ALTER. A syntax that prescibed ADD A TO B GIVING C instead of C:= A + B; did not make things better. (Cobol has evolved since then!) But Cobol had a feature which was missing in Algol, it could handle records. So Langefors suggested that we add a record and input/output part to Algol, modeled after Cobol. The addition was called Genius (Generellt i ut system).

Ingemar Dahlstrand had then implemented Algol for BESK and Facit EDB in a pioneering work. We used the experience from that implementation and engaged one the designers Sture Laryd. He worked together with Gunnar Ehrling, a pioneer from Matematikmaskinnämnden and so we were able to get a good, efficient and reliable implementation of the Algol part. The specification was compatible with Algol 60 with few exceptions. Since the Algol 60 implementation is a subject of Ingemar Dahlstrand's paper, I will not go into further details on that.

Based on the ideas from Börje Langefors, Gunnar Hellström and the author made the detailed specification and supervised the implementation of the Genius part. Data declared in Genius were globally accessible. The syntax was rather faithful to Cobol except that it used underlining, like in Algol, instead of reserved words. A reflection: At that time the fact that you in Algol could use any names for your variables was seen as a great advantage. But all modern languages use reserved words and no one is complaining. The record concept was mostly used to model and format data on the peripheral equipment, it was not as flexible as in later languages like Pascal.

The verbs in Cobol were replaced with procedure calls since they were part of the Algol program. One could open and close files, read, search and write records etcetera, most of what you could expect.

Applications

The first version of Algol-Genius was released in 1964 and it soon became evident that the language, as well as its implementation, was well suited for a wide range of applications. It was used as the preferred programming language for most of our customers. This was true both for technical and administrative applications. It turned out that performance could only in specific cases be substantially improved by using assembler. Let me just mention one example. Kockums shipyard was then the leading builder of big tankers in the world. Under the leadership of Kai Holmgren it introduced CAD/CAM methods early on. With Algol-Genius as a base, a language and a system called Styrbjörn/Stearbear was developed for the entire design process. Kockums shipyard is long gone but Stearbear still lives on, now under the name of Tribon. The software has of course been ported from D21 and Algol-Genius way back, but Tribon is still a very successful, although not very well known, Swedish software company.

Extensions

Datasaab had a very active user club and one favorite subject of that club was extensions to Algol-Genius. Since we owned the language, the formalities were minimal. If enough customers wanted an addition and we deemed it reasonable we would implement it. One feature, which I still have bad feelings about, concerned punched tape. Algol-Genius already had quite powerful procedures for that but we got a request for further automation from Industridata who used D21s and later D22s in their service bureaus. They had to accept and process tapes coming from cash registers

etcetera with many different formats. Together with them we designed a table driven method to handle this but it was not very successful and surely not worth the while. But a good example of the close cooperation we had with the customers.

Datasaab D22

Hardware

D22 was launched in 1968. It was a much more advanced computer with protected mode for the operating system, ability to address 256 k word (768 kb) of memory with a cycle of 1.6 µs. Floating point arithmetic was introduced in the hardware. Professor Germund Dahlquist was engaged as a consultant and did a pioneering work in specifying an arithmetic with a minimum of rounding errors. D22 was provided with character handling and decimal arithmetic to get efficient execution of Cobol programs. Quite an effort went into making the decimal hardware as Cobol-compatible as possible. All of these improvements could be had without breaking the compatibility with D21. Existing binary D21 programs run without problems.

The peripherals were modernized and extended, the most important addition being disk memories with removable disk packs. Tape standard was changed to be compatible with the market (read IBM), while still being program compatible with D21. D22's communication with the outside world was handled via a front end computer, Datasaab's own 2100. That same computer is also used in the ATM described by Viggo Wentzel in his contribution to this conference.

Market

D22 was of course the natural choice for the D21 customers. But sales were not limited to those, all in all some 70 systems were delivered up and until 1975. However 70 was a way to small number to create any interest in the independent software vendors that begun to emerge at this time. They picked of course IBM machines as their target. For this reason, the first IBM-compatible machines, exemplified by Amdahl, made their entrance at this time. Datasaab D23 was an attempt to build a computer that could emulate D22 as well as IBM/360. But time run out for this project, it was in fact doomed from the beginning.

Other software than Algol-Genius

The major software effort for D22 was an operating system. It inherited the name Dirigenten, but was on a totally different scale, with true multiprocessing facilities. The work was lead by Jan Nordling. Dirigenten was optimized for batch processing and was extended for time sharing later on. Jan Nordling and his colleagues had taken part in the design of the hardware which consequently was well suited to multiprocessing, but there was still a lot of new ground to be covered.

As indicated above, D22 got a Cobol as well as a Fortran implementation. Good and efficient but not widely used, Algol-Genius continued to be the preferred language.

Datasaab developed applications in some targeted areas, mainly health care and logistics. The logistic system was appropriately named Lagom. It was quite successful and survived D22 by being converted to Univac 1100 and also to Unix.

Algol-Genius

Since D22 was compatible with D21, conversion was no problem. Few additions were needed to the Algol-Genius language, the major one being indexed-sequential files for the disk memories. Still a substantial work was done in the compiler to take advantage of the new features in the hardware.

Univac 1100

Background

The small number of computers we managed to sell and the consequent lack of interest from software vendors killed Datasaab's mainframe line (tunga linjen in Swedish). A deal was made with Sperry Rand, who acquired the D21, D22 and D23 lines, resulting in a joint venture, called Saab-Univac, formed in 1975 The goal was to convert as much as possible of the customer base to Univac computers, specifically Univac 1100.

Algol-Genius

It was soon decided that the best way to move the existing customers to Univac 1100, was to implement Algol-Genius for that computer. Once more we had an Algol implementation that could be used, this time already running on 1100. It came from the University of Trondheim (sic!) and required very few changes and additions. The Genius part had to be built from scratch. Since it was quite dependent on the operating and file systems, it was implemented in close cooperation with Univac. For that purpose Hans and Christel Ljungren spent a winter in Minneapolis/St Paul.

It was not possible to achieve 100% compatibility because of differences in the hardware as well as in the operating system, but it turned out that conversion was fairly painless, definitely so compared to other alternatives. Algol-Genius contributed no doubt to the fact that Saab Univac lost only few Datasaab customers to other vendors.

Saab-Univac did not commit itself to develop Algol-Genius, further, it was after all a proprietary language. The customers thus gradually converted to other languages. But even so Algol-Genius got a long life. Even at the end of the nineties, some Algol-Genius programs were used in production and subject of necessary maintenance. But as far as the author knows, none survived the millennium.

What can we learn?

Software is expensive to develop but cheap to produce, that is copy and distribute. This means that volumes are crucial for the economy. With big volumes a vendor has a great freedom in setting prices on his software. Maybe even more important than the price advantage is the fact the big volumes attracts other players. It becomes interesting to develop add on products, to specialize in consulting and training for that software etc. which in turn makes it even more attractive to customers. Consequently, in each specific software area there will always be a gorilla and a few chimpanzees [Moore].

Datasaab tried not only to build and sell software, it did so with software that could only run on its own, very proprietary, platform. And this in a language area and a geographic market that was minimal. In hindsight the result was inevitable.

If it was difficult then, today it would be totally impossible. Operating systems, middleware, development environments, runs to millions and millions lines of code. The corresponding D22 software was tiny! So now we have one gorilla, Microsoft, and a few chimpanzees, the Unix/Linux companies. By using one of these platforms and specializing in a specific software area it is possible to succeed. In other words, let others solve the accidental problems and focus on the essential ones. I have already mentioned Tribon, another example is Opera from Norway and doubtless there are many others, unknown to me.

Linux, by the way, solves the accidental problems. The invention is a fascinating, novel business idea. Can you, by the way, call "giving away for free" a business idea?

Embedded systems is another very interesting area. Whether it is mobile phones, process control, car and engine control, it starts as a very proprietary product. Only the hardware vendor has access to the interface specifications and is interested in developing the software. But gradually, as the applications grow, the need for other sources arises, as well as the interest from software vendors to contribute. Standards evolve that make this possible. So far we in Scandinavia have been quite successful in embedded systems but the fight is not over yet. Let's hope that Symbian, backed by Nokia and Ericsson-Sony, will be the gorilla in the mobile phone market and that Microsoft has to be satisfied with the role of a chimpanzee.

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Automatic Teller Machines, a Datasaab project in 1970-1985

by Viggo Wentzel

Abstract. The development of an automatic teller machine is described. This product from Ericsson and Omron featured high capacity and significant improvement in security and customer interface. Swedish and Finnish banks used a large number of units for almost a decade.

The product

This is an automatic teller machine (ATM), or uttagsautomat, or Minuten, or Bankomat, or customer activated terminal. It is most certainly a quite unnecessary information since this type of machine is regularly used by a majority of the population in the Nordic countries. Behind the front panel, however, is a complicated system with electronic and mechanical components, computers and computer software. Because the machine handles cash and is constantly exposed to the general public, it must meet great demands on reliability, security, and availability. In addition it must withstand various degrees of vandalism without hurting the vandals themselves. In 1995 the Swedish saving banks recorded 133 million transactions in 1007 ATMs, which means an average load of 11000 transactions per ATM and month. The corresponding cash flow was the fabulous sum of 133 billion kronor.

This paper describes how an ATM was designed, produced, and maintained by Ericsson and the Japanese company Omron, and how it dominated the Swedish and Finnish market for almost a decade.

Background

In the 1960[ies] banks in many countries started to introduce self-service terminals, primarily for cash withdrawal. The long-term goal was to provide better service to the customers and lower the banks cost. In Sweden Sparfrämjandet contacted TetraPak, later Meteor to develop an ATM, and at the same time Handelsbanken introduced the name "Bankomat" which today is the common Swedish name for an ATM in general.

The saving banks in Sweden took a major step forward in the second half of the 1970[ies] by installing 600 Docutel ATMs. The task to install and maintain these machines was given to the Datasaab service organization. In the meantime Swedish commercial banks had formed a common organization called Bankomatcentralen.

In the middle of the 1970[ies] Datasaab started to market an ATM family developed jointly by Datasaab and the Finnish company Valmet, and based on a cash dispenser from Inter Innovation. This product did not however become a commercial success in Sweden but a couple of hundred

were sold in Finland, Norway, Austria, France and Spain. In 1981 Datasaab had accumulated considerable experience in designing, marketing, and maintaining ATMs, but unfortunately losses had also accumulated. Ericsson took over Datasaab the same year, and it was indeed doubtful if Ericsson would be willing to continue such an unprofitable business.

However the steady increase in the number of transactions made it soon necessary for the banks to install more and better ATMs. The Swedish saving banks, represented by the commonly owned company Spadab, worked out a specification of a new ATM with greatly increased note capacity and a very high degree of security to replace the Docutel machines. Banks were very important customers to Ericsson and such a major challenge from the saving banks could not be ignored. The ATM group in Linköping (former Datasaab) was assigned the task to work out a plan how to meet the requirements and if possible convince Spadab. But conditions were tough: It was either win or disappear, and furthermore the number one and only alternative was to find an external supplier and keep own costs to a minimum. However Ericsson got the subsequent order in the beginning of 1984, and the result was a product that turned out to become the dominating ATM in Sweden and Finland for almost a decade.

How to find a partner

In 1982 the ATM group in Linköping started a worldwide search for a partner. It soon became apparent that no available standard product met Spadabs specification. Therefore a partner must be willing to undertake a development effort at his own risk, which narrowed the search considerably. Finally Omron Tateisi Electronics in Japan was selected for further technical discussions and negotiations. Omron had a high reputation as a supplier of banking equipment, including ATMs, and they already had a number of usable components, especially the vital cash dispenser. Gradually a working concept evolved where a complete ATM was compiled of components from both companies:

Ericsson	Omron
Responsible for the entire system	Mechanical design
Main computer	Note dispenser
System software	Magnetic card reader/writer
Application software	Visual display unit
Communication software	Printers
Security	Customer detector
Overall design	Operator panel
Ergonomics	Power supply

The necessary safe was specified by Ericsson/Omron, but was purchased by Spadab directly from an external supplier.

The above concept was discussed intensely within Ericsson. Why favour Omron rather than Swedish and European suppliers? Could cooperation with Omron really work, having in mind cultural differences and geographical distance?

Finally the ATM group got approval to present the concept to Spadab, where it was met by outright mistrust, slowly changing to scepticism and finally approval.

How to organize the project

In theory the prospects for a successful project looked very good. Both companies were highly competent and most components in the proposed product were well proven. But one vital thing remained: To establish an organization between the companies that could function effectively. Theproject was assigned to the ATM group in Linköping, reinforced with a senior member from the purchase department, altogether around ten persons. A similar group was established at Omron. Both groups had support from the main line organizations. The Ericsson group was split up at the end of the project due to a major reorganization, and the development of the application software was done elsewhere. The contacts between the companies were however handled by the original group throughout the project.Several of the Ericsson people had worked with foreign companies before,

but none had been in Japan. Personal relations, common sense, and humour overcame cultural differences.

Meetings

Project meetings were held about four times a year by turns in Linköping and Kusatsu. These meetings were thoroughly prepared in advance and all decisions were documented. All kinds of problems could be brought up, from contract issues to technical details. The Spadab requirements were sometimes somewhat vague and changing but nevertheless had to be transformed to a crystal clear specification between Omron and Ericsson.

In addition these meetings had a social function and also helped to establish good personal relations. It was of vital importance to create a spirit of trust and honesty in the groups. Then it was much easier to solve inevitable conflicts.

The meetings in Kusatsu were often combined with visits by Spadab representatives. Sometimes these visits resembled a balance on the knives edge, and even the Japanese hosts had some difficulty to keep a straight face. When project meetings were extended to night hours noodle soup was served as refreshment. Maybe "noodle" had a double meaning?

Communication

This was pre-Internet time so high quality fax was used for daily communication. Even detailed drawings could be transferred without delay. The time difference between the countries was an advantage rather than a drawback. In the morning the Linköping people picked up the nights fax from Kusatsu, and in the evening the answers were sent back to Japan. Thus the project could proceed round the clock.

Working together

Technicians and designers from both companies worked together without intermediaries, which created a spirit of objectivity, and technical problems were solved together without prestige consideration. It seems that Japanese people pay much attention even to small problems, and it turned out that Swedes had the same attitude — at least 20 years ago.

Some technical aspects

It is not the intention of this paper to describe the ATM technology in detail since it is not of general interest today. However two aspects are worthwhile mentioning, logistics and security.

Logistics

It is a well-known principle in all production to keep the value of inventory as low as possible. The majority of the Omron equipment was shipped by boat that required careful planning. The installation schedule had to be known well in advance and not be subject to major changes. To lower the inventory value it should not be necessary to perform a complete test of the entire ATM before shipment to the customer. Such a requirement must be taken in account in the design process from the beginning. Instead all ATM components met for the first time at the customer's site and were assembled without any major problem.

Security

The Ericsson/Omron ATM had a cash capacity of 10000 notes and consequently physical and logical security was a major concern.

The individual customer's card number and pin code were processed in an Ericsson security module located at the keyboard. Data to and from the bank's central computer were encrypted. The transaction was either approved or refused and was sent encrypted to the cash dispenser located in the safe. By this arrangement it was impossible to empty the cash dispenser by manipulating the signals to this unit.

The safe in an ATM has a fundamental weakness in the narrow slit through which the notes are fed to the customer. It is much easier to blow up a safe from inside than from outside and an attempt to put even small quantities of explosives into the safe must be stopped. If for some reason alarm was triggered a shutter immediately closed the safe slit.

Maintenance and relibility

The first Ericsson/Omron ATM became operative at Växjö Sparbank in 1985. More than 900 machines were delivered to Swedish saving banks. In addition 400 machines went to Bankomat-centralen, Nordbanken, and Automatia Pankiautomaatit OY in Finland. The Ericsson service organization was responsible for maintenance in Sweden.

Spadab originally specified 6000 transactions per month and ATM. In reality the average load became twice as many. This reflects the changing attitude towards ATMs by Scandinavian people from suspicion to general acceptance.

In 1995 an average of 12 errors per year and ATM were recorded. However only some error types caused the ATM to shut down, and the availability was between 94 and 95%.

Attempts to steal money from the ATMs by brute force have failed.

What happened then?

Since the ATMs sustained a high load and had a long life the Swedish market was rather saturated for several years. When replacement started in the second half of the 1990[ies] Datasaab and Ericsson Information Systems had vanished long ago. As far as the author knows, Ericsson today has no interest in ATMs. At the end of the century all Ericsson/Omron ATMs had been replaced by more modern products. The saving bank in Linköping donated one ATM to the Linköping University, and it is now part of the small computer museum.

Some closing remarks

"The aim of the HiNC-1 conference is *to re-examine our past and to extract experience and knowledge which we may use in order to make wiser decisions about future endeavours in development and use of information technology in the Nordic countries."*

It is the author's opinion that the ATM project has some elements, which are well worth to retain for the future. The technology had good quality but was not spectacular. No inventions were made, no patents granted. But standard components from both companies were put together in a clever way, and the result was a very powerful system meeting the customer's specification.

Today's spectacular communication facilities have made it possible to form alliances all over the world without geographical limitations. What must be kept in mind however is that communication is not enough. The Ericsson/Omron ATM project emphasized a number of other conditions for success:

- Both parties must have strong incentives to fulfil the project, and this must be re-examined during the project since conditions may have changed.
- · The project manager must have sufficient authority and integrity to fend off attacks against the project. Such attacks could be lower overall priority, reorganization of the company, or even political considerations.
- · Good personal relations between those directly involved in the project must be developed, and also a spirit of trust. Then it is easier to sort out unpleasant situations.
- · Try to identify critical technical issues and keep them to a minimum. Otherwise the schedule tends to get out of hand.
- · Technical people from both parties must be given the opportunity to work together.
- · Project managers must learn "to smell a rat" when vague problems are conveyed from people who are not verbally gifted or unwilling to admit a mistake.

To develop a good project climate takes time — and time is a rare commodity nowadays.

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Note: Datasaab was owned by Saab Aircraft Co in Linköping until 1978 when it became a separate company, Datasaab AB together with Stansaab AB in Stockholm. In 1981 Datasaab AB was acquired by Ericsson Information Systems AB, followed by Nokia in 1987.

Årsmöte 2003
Torsdagen den 4 december är det dax för årmötet.