# BDD
# Company - Competences - People

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## Contents

# 1. Let's introduce BDD to You

BDD Business Design and Development supports You in the business development and design process. But there is more, BDD can do for You. By combining university high level theoretic knowledge and practical experience, any solution provided and implemented by BDD will be specifically tailored for You. Focusing on technical and infrastructural aspects, any solution can be further improved and refined on the project management level. To achieve that goal, we've defined the following services as the core of our business.

- Statistical Performance Analysis and Simulation are often brought to such a high level, that these tools are not applied to practical situations. We bridge the gap between theory and practice to provide low cost high effective designs.
- Economic Decision Support and Project Management are the cornerstones of customer interaction. We provide Economic Decision Support by revealing hidden cost factors and aid budget preparation up to full Project Management to our customers at the desired level.
- Software Development and System Integration. We achieve a high cost-performance ratio by aligning the latest technologies, industry standards and open source developments.
- Design and Implementation of Corporate Networks, Integration of telecommunication and data services.
- Statistical Modeling and Implementation of accompanying computer algorithms.
- Documentation Layout and Training. A well designed and implemented project gets even better if people know more about it and are better trained.

If there is an improvement, we'll work it out. As teamwork is a very important factor in reaching our customers targets, we support and are supported by a

wide range of partners like FAS-Tech, Softcom Data, ACS, Ericsson, Lucent Technologies, Avaya, Aspect, Alcatel, Linkbit Technologies, Atello, Oracle, Chordiant, Telesoft Technologies and Thomas Widder GmbH.

## 2. Reference List

1. Hofman & Maculan

    - Design & implementation of BKPS, a database application for cost calculation, cost analysis and cost control.

2. Pharmazeutic Company (As desired by the customer, we keep his privacy)

    - Design & implementation of a medical database in assembler for low-cost DOS-based Portfolio PC's as part of a marketing and advertisment strategy

3. Capita Leasing / Newcourt

    - Coverage of organizational and technical aspects of structural changes, coordination of all involved companies to prepare a head quarter office
    - Technical coordination of a project regarding the wide-area network expansion to subsidiaries in Eastern Europe (Prague, Moscow, Budapest, Warzaw)
    - Design & implementation of a multitiered information infrastructure, mainly based on voice (telephone, voicemail) and data networks (file, print, mail), interconnected by a region wide WAN structure
    - Management of network and IT infrastructure, telephone switches, voicemail systems, file- and printservers, mailservers, attached clients and telephone sets
    - Evaluation of technical aspects in leasing offers

4. Lucent Technologies

    - Migration of hybrid UNIX / NT network with file-, print-, mail and application services to a corporate environment.

- Design & setup of a backoffice solution, supported by a interactive voice response system (based on UNIX and ORACLE 4.0)
- Design & implementation of a CTI-Environment for demonstration and training purposes (based on Novell with BTrieve database and the Definity telephone switch)
- Management of network and IT infrastructure, telephone switches, voicemail systems, file- and printservers, application servers, attached clients and telephone sets
- Technical and design support for external projects
- System- and network design, implementation, application design & configuration of a European-wide database application for marketing purposes (based on Windows NT 4.0, ORACLE 7.3). The following countries were involved in the rollout of the project: Czech Republic, Slovakia, Russia, Hungary, Poland, Belgium, Bahrain, Austria, United Kingdom, Netherlands, France, Spain, Germany and Italy

5. AT&T

   - Management of network and IT infrastructure, telephone switches, voicemail systems, file- and printservers, mailservers, attached clients and telephone sets

6. ISP & IVSP (As desired by the customers, we keep their privacy)

   - Technical facilitation and business case design for public attached alternative service providers
   - Requirement analysis and design of a billing system for multiple service providers
   - Reliability and performance evaluation of network and telephony infrastructure (design for high availability, tuning of equipment parameters, path analysis)

7. Unisys

   - PreSales support for Lucent Technology products including cost justification and performance evaluation services

- Technical and design support for external projects

8. Mobilkom Austria

   - Analysis of the existing telephony infrastructure
   - Design of a multisite call centre and CTI-Environment based on Lucent Technologies and Genesys products
   - Reengineering of the telephony infrastructure components based on distributed call centre concepts
   - Environment definition and evaluation of measured data with respect to a fully loaded system
   - Customer specific training in telephony protocols, CTI interfaces and call centre performance analysis
   - Specification of a multimedia capable service platform with respect to call centre, unified messaging, public and private networking requirements
   - Design and implementation of a multisite telephony diagnostic suite based on latest CTI technology
   - Support for interconnection of the existing telephony infrastructure via ATM including synchronisation issues
   - Redesign of the multisite call centre and CTI-Environment by incorporating new products from Avaya and Nortel Networks
   - Planning and technical support for migration and integration of the latest VoIP technology into the private telecommunication network
   - Development of customized interfaces and testing solutions for public and private network components
   - Design and implementation of a call centre data driven load balancer solution integrated with the public network
   - Introduction of mutiple tenants and resource splitting across the private network

9. Hutchison 3G

   - Contribution in an international worldwide contact centre environment

- Installation and implementation of a standard Aspect Enterprise Contact Centre, customized middleware connectors and process control applications
- Integration and testing of contact centre solution into EAI driven application environment
- Localization of bespoken application, service and business process logic
- Preparation of a survey on transmission technology (ATM, SDH, PSTN) to be used for international interconnection of contact centre locations
- Provisioning of a web based business reporting solution
- Design of a DDE driven bridging solution for third party application integration

10. Hewlett Packard

    - Bid management support for complex contact centre projects
    - Design of a multisite contact centre based on Cisco and Avaya products

11. ÖAMTC

    - Exploratory data analysis and generation of statistical reports for spatial data
    - Evaluation of fairness in spatially dependent decisions
    - Validation of surveys with empirical data

12. Various

    - Design & layouting of books, training documentation and education material
    - Design & execution of training courses
    - Preparation of congress papers and presentations for infrastructural issues in high-speed and photonic networks
    - Infrastructure consulting and economic decision support
    - Development of mathematical and statistical algorithms
    - Design of specialized artwork for industrial applicants
    - Design and implementation of INAP based service handlers and IN services

# 3. Competences

## 3.1. Christian Dombacher

### 3.1.1. Education

- 1986 to 1991 academy for engineering (HTBLA Wien Donaustadt) graduated degree: Ing. (passed with distinction)
- 1991 to 1995 university (Technische Universität Wien, Universität Wien: Business Informatics / National Economics); Diploma thesis „Analytic Solution of Queueing Models“ supervised by Prof. H. Stadler, finishing up with degree Mag. rer. soc. oec.
- 2004 to 2008 university (Technische Universität Wien: Mathematics in Technology and Science / Statistics); Diploma thesis "Stationary Queueing Models with Aspects of Customer Impatience and Retrial Behaviour" supervised by Prof. K. Grill, finishing up with degree Dipl.Ing. (3rd diploma passed with distinction)
- 2008 to 2010 university (Technische Universität Wien); Dissertation "Queueing Models for Call Centres" supervised by Prof. K. Grill and Prof. W. Schachermayer, finishing up with degree Dr. (passed with distinction)

### 3.1.2. Skills

1. Electronic data processing and informatics
    - basic database engineering (BS2000 / UDS with embedding in COBOL, Oracle with embedding in C, Informix, DBASE / CLIPPER, SQL)
    - advanced database modeling (metamodeling, data mining and data aggregation)
    - programming languages (Turbo Pascal, Modula, C, Cobol, Basic, machine oriented programming in Assembler, object oriented program development in Java, C++, GAUSS, a matrix computational language designed for analyzing & simulating large mathematical & statistical environments)
    - shell scripting and little languages (MS-DOS and 4NT batch files, UNIX shell scripting for sh, bash, csh and derivatives, SED and AWK)

- network protocols, network design and products, network programming for distributed applications and performance engineering (TCP / IP protocol suite, SPX / IPX protocol suite, Ethernet, HDLC, FR, Token Ring, SNA, ATM and embedded technologies, e.g. MPEG, SONET, OSI 7-layer model incl. application layer, intra / interworking)
- data and process representation (EDI, XML, ASN.1, SDH and UML)
- web based application development (HTML, XML, JSP, MCV Struts, PHP)
- server and workstation operating systems (UNIX / SINIX / XENIX / SOLARIS / LINUX, BS2000 (Siemens), MS-DOS (Versions 2.0 to 7.1) incl. MS-Windows, VMS (DEC), Novell NetWare, OS/2, Windows NT 3.51 and above)

2. Statistics and mathematics

   - basic mathematics (algebraic manipulation, matrix calculations & linear algebra, solution of linear & non-linear equations, real & complex analysis, approximation techniques & functional analysis, differential & difference equations, set theory)
   - basic statistics (data-analysis, testing of hypothesis, parameter estimation, multi-variate methods, combinatorics, probability & measure theory)
   - advanced topics (reliability theory, queueing theory & performance analysis, analyzing non-precise data, mathematical statistics, Bayes statistics, optimization theory, graph theory, statistical quality control, time series, stochastic processes)
   - mathematics for project scheduling (netplans, petri-nets, etc.)

3. Telephone systems & telecommunication protocols with performance analysis

   - analog switching incl. performance engineering for switches, concentrators (e.g. optimizing outlets) and optimal selection of resources (e.g. operators)
   - digital switching technologies (T1 / E1, TST and STS switch architecture, time slotted protocols) incl. performance engineering

- ISDN incl. protocol stack & performance engineering
- B-ISDN and ATM incl. protocol stack & performance engineering
- QSIG incl. protocol stack & performance engineering
- wireline services, architecture and protocol stacks (SS7, IN, broadband IN, AIN) & performance engineering
- wireless services, architecture and protocol stacks (SS7, IN, CAMEL, WIN, GPRS, UMTS, Wireless ATM) & performance engineering
- advanced switch software technology and interfaces (SCAI, JAIN)
- voice, video, data and multimedia services based on H.320-H.329 standards
- computer telephony and IN integration based on RFCs by the IETF (SIP, MGCP, MEGACO, PINT)
- CTI services, architecture and protocols and APIs (ASAI, TSAPI, JTAPI, TAPI, CPL, SIP-Servlets, Genesys API, Avaya Interaction Center APIs and related ORB)

4. Application techniques

- speech recognition technology (speech databases, hidden markov models, grammars)
- object oriented analysis, design and implementation with respect to component reuse
- mathematical formulation and implementation mapping of object oriented design patterns (state machines, sparse matrixes)
- information representation and conversion (HTML, XML, VoiceXML, WML), engineering for common data platforms
- middleware and enterprise application integration (EAI) technologies (business object models, multitiered architectures, event management, CORBA, EJB)
- collaborative software development using the Eclipse IDE
- data compression algorithm design and implementation
- security engineering for network and telephone systems (VPN, encryption, tunneling, call barring, fraud protection, intruder detection)

- system engineering for limited resources (software design for embedded systems, communication stack optimization)

5. Law, business and national economics

   - standard micro- and macroeconomics
   - focus on monetary aspects (currency, exchange rates, investment rates and institutions like national bank, IMF)
   - focus on mathematical modeling of dynamic, multinational models studying the impact on prices, wages, investment rates, exchange rates, etc.
   - bookkeeping
   - economics incl. structural and run-time planning, motivation of people, company leadership, investment planning, storage keeping & inventory planning, product planning & marketing, financial planning
   - income taxation (EStG), value added tax (UStG), trading (UGB / HGB), employment (AR, ASVG), data protection (DsG), constitutional and administrative law (Verfassungs- und Verwaltungsrecht)

6. Project management for EDP and non-EDP projects

### 3.1.3. Memberships and Certifications

1. Former Member of the IEEE Reliability Society
2. Member of the Society for Industrial and Applied Mathematics (SIAM)
3. Member of the Austrian Mathematical Society (ÖMG)
4. Member of the Institute Of Mathematical Statistics (IMS)
5. Member of the European Mathematical Society (EMS)

### 3.1.4. Product Knowledge

Product knowledge covers but is not limited to products from AT&T, Lucent Technologies, Avaya, Aspect Communications, Ericsson, Alcatel, Nortel Networks, Xylogics, 3COM, US-Robotics, Cisco, Compaq, Microsoft, Novell, WRQ, Oracle, IBM, Sun, SCO, Minitab and Update Marketing.

## 3.2. Norbert Frese

### 3.2.1. Education

- 1982 to 1990 high school (BRG Gänserndorf)
- 1990 to 1997 university (Technische Universität Wien: Studies in Land Use Planning and Regional Policy). One year at the School of Architecture in Portsmouth / GB (with ERASMUS exchange program). Diploma thesis "compensation of external costs of traffic-noise", finishing up with degree Dipl.Ing.

### 3.2.2. Skills

1. Electronic data processing and informatics
    - database modeling and design (SQL, general data storage concepts, web integration, mathematical / statistical data aggregation techniques)
    - programming languages (C, C++, C#, Turbo Pascal, Microsoft Visual Basic, Avenue, Assembler, Java)
    - shell scripting (MS-DOS batch files, UNIX shell scripting for sh, bash, csh and derivatives, Python, Perl)
    - object oriented design and implementation in Java (application servers based on EJB3 and Hibernate)
    - data and process representation (XML and UML)
    - client side web design and coding (HTML, Javascript, Java Applets)
    - server side web design and coding (XML / XSLT, XML-RPC, Java-Servlets, JSP, PHP, Perl / CGI, MVC Struts, Content Management)
    - server and workstation operating systems (SOLARIS, LINUX, MS-DOS (Versions 2.0 to 7.0) incl. MS-Windows, Windows NT 3.51 and above)
    - hardware near interface programming for data networking and telecommunication applications (low level IP, RS232, ISDN, CTI)
2. Statistics and mathematics

- basic mathematics (differentiation, integration, algebraic manipulation, matrix calculations, solution of linear & non-linear equations)
- basic statistics (data-analysis, multi-variate regression, anova-tables, combinatorics, probability theory)
- advanced topics (network analysis, fluid flow models, optimization theory, graph theory)
- application of off-the-shelf software packages and development tools for statistical purposes (SPSS, Polydrom, Arcview, MatLab, GAUSS, Microsoft Access, Microsoft Excel, Java)

3. Application techniques

   - collaborative software development using the Eclipse IDE
   - spatial data analysis using geographical information systems (GIS)
   - generation of thematic maps (spreading of noise, traffic flows and network attributes)
   - development of 2D and 3D models using CAD (Arcview, Autocad, 3D-Studio)

4. Computer telephone integration and voice over IP

   - CTI services, architecture, protocols and APIs (ASAI, TSAPI, JTAPI, TAPI, Genesys API, Avaya Interaction Center APIs and related ORB)
   - billing interfaces and CDR formats
   - voice, video, data and multimedia services based on the H.323 standard suite

### 3.2.3. Product Knowledge

Product knowledge covers but is not limited to products from Netgear, Avaya, Aspect Communications, Microsoft, Sun, Nortel Periphonics, SPSS, Esri and Autodesk.

### 3.2.4. Personal Reference List

1. B.O.T.

    - Preparation of training documentation and education material
    - Lecturing of trainings in Microsoft Excel (usage and macro programming) and Microsoft Access

2. BMWV (austrian ministry of transport)

    - Design and implementation of a software package for the analysis of macro-economical and environemental impact of projects
    - Map creation of network attributes / flows using GIS
    - Data aggregation and analysis using standard software packages such as SPSS, Microsoft Excel and Microsoft Access
    - Development of documentation, specifications and interface definitions

3. AKG acoustics

    - Design and implementation of a software package to check interferences of wireless-microphones (programming languages used include Microsoft Visual Basic as well as Java, C++ and C#)
    - Design and implementation of a server based application 'WMS Frequency Management' (technologies used include SQL, XML, XSLT, VB, Java, JDBC, JSP, PHP and HTML)
    - Design and implementation of a distributed application cluster for CPU intensive frequency calculations
    - Development of interfaces and control applications for electroacoustic devices

4. Lucent Technologies

    - Design and implementation of Spesomat, an application to handle travel expenses according to Austrian laws and regulations
    - Profile definition of a marketing database application using client / server technologies

5. Prisma Solutions

    - Participation in development of application servers for GIS (technologies used include Java, EJB3 and Hibernate)

6. Various

    - Design and implementation of XMLcmNOW, a XML / XSLT-based content-management system in Java
    - Design and implementation of a vector parsing tool for the Definity series of telephone switching systems from Lucent Technologies / Avaya.
    - Adaption and extension of existing CTI APIs from Avaya / Lucent Technologies to have diagnostic information accessible
    - Design and implementation of data gathering tools for benchmarking purposes
    - Design of test scenarios, statistical data aggregation and analysis of test data
    - Design and implementation of a flow based mediation unit for billing purposes
    - Development of graphical user interface extensions (Java Libraries) at sourceforge.net
    - Development of UNIX socket API for JAVA
    - Development of JDBC drivers
    - Design and implementation of various websites, using technologies like HTML, XML, XSLT, Perl, MySQL
    - Design and implementation of a CTI diagnostics suite for the Avaya Definity Enterprise Communication System
    - Design and implementation of a RPC library introducing loose typing with APIs for C, Java and PHP
    - Contributions to the open source desktops KDE and Gnome

## 3.3. Wolfdieter Dombacher

### 3.3.1. Education

- 1956 to 1961 Academy of Engineering, Department for Electrical Engineering, graduated with distinction
- 1961 to 1962 Military Academy of Engineering, final rank: Captain Technical Services

### 3.3.2. Skills

1. Electronic data processing and network infrastructure
    - programming languages (Assembler, Fortran, Cobol, Basic)
    - network protocols, network design and architecture (TCP / IP protocol suite, switching/routing, Ethernet, Fast Ethernet, HDLC, FR, Token Ring, ATM and services, SONET / SDH, ad hoc networking)
    - data and process representation (EDI, ASN.1, SDH and UML)
    - cabling system architecture and design (dedicated cabling, structured cabling, F/O – copper cable systems, cables, patchcables and connectors, product and system testing and evaluation)
2. Telephone switching systems and telecommunication protocols
    - analog switching and networking technologies, analog telecommunication protocols, switch and network architecture
    - digital switching and networking technologies, digital telecommunication protocols, switch and network architecture
    - ISDN protocol stack, network services, international variants
    - B-ISDN and ATM protocol stack, network services
    - QSIG protocol stack, network services, international variants
    - wireline networks, services, architecture and protocol stacks (SS7 / C7 protocol suite, IN, AIN, broadband IN)
    - wireless networks, services, architecture and protocol stacks (SS7 / C7 protocol suite, IN, CAMEL, MAP, WIN, GPRS, EDGE, UMTS, IMT 2000, 3GGP, 3GGP2, ad hoc networks)

- advanced switch software technology and interfaces (SCAI, JAIN)
- voice, data, video and multimedia services based on H.320 up to H.329 standards
- CT and IN integration based on RFCs by the IETF (SIP, MGCP, MEGACO, PINT)
- CTI services, architecture, protocols and APIs (ASAI, TSAPI, JTAPI, TAPI, Genesys API)

3. Application techniques

   - speech recognition technology (speech data base, speech scripting language and protocols, grammar description language and protocols )
   - middleware and enterprise application integration (EAI) technologies and architectures (business object models, business process models, multi-tier architectures, event management, e-business, CRM, CORBA, EJB)
   - security engineering for telecommunication networks (VPN, encryption, tunneling, call barring, fraud protection, intrusion detection)
   - system architecture, design and development reviews, infrastructure reviews (R&D, M&A)
   - system engineering for limited resources (hardware design for embedded systems, interface design for small systems)

4. Management of projects

   - telecommunication, information technology, infrastructure and other projects

5. Training and education

   - telecommunication technology, architecture and protocols (TCP / IP protocol suite, routing protocols, photonic switching and protocols, call/contact center design, CTI, CMR, H.320 – H.329, IP-Telephony, IP-convergence protocols - SIP, MGCP, MEGACO, PINT)

- telephony technology, architecture and protocols (analog interfaces and protocols, digital interfaces and protocols, T1 / E1 – T3 / E3, PDH / SDH / SONET, ATM interfaces / protocols / services, SS7 / C7 protocols, GSM, GPRS, EDGE, UMTS, IMT2000, 3G architecture and protocols, 4G architecture and protocols, IN interfaces/protocols/service design)

6. Advisory and expert opinion

    - witness expertise and surveillance (expert opinions of telecommunication systems, call / contact centers, CTI / CT systems and integration, network infrastructure, convergence projects, e-commerce and CRM projects)

### 3.3.3. Memberships and Certifications

1. Former Member of the IEEE Communication Society, the IEEE Computer Society, the IEEE Technical Committee of Information Infrastructure and the IEEE Technical Committee of Signal Processing & Communications Electronics
2. Member of the New York Academy of Science
3. Member of the ATM Forum
4. Member of the System Architecture Review Board (SARB)
5. Certified Project Manager (CPM)
6. Certified System Architect (CSA)
7. Certified Subject Expert (CSE)

### 3.3.4. Product Knowledge

Product knowledge covers but is not limited to products from AT&T, Lucent Technologies, AG Communications, Avaya, Telcordia, Alcatel, Aspect, Nortel Networks, Periphonics, Intervoice Brite, Syntellect, Index, Network Alchemy, Barphone, Bay Networks, Cisco, RAD, ADC, Agilent, Telesoft Technologies, Telsis, Siebel, Clarify, Chordiant, eLoyalty, ePiphany, Pivotal Corporation, Quintus/Avaya, Nabnasset, NMS, Aculab, PIKA, Intel, Genesys, MetraTech Billing,

Nazca ISP-Billing, Solect, BEA, Crossworlds, Tibco, SpeechWorks, Nuance, CDC, IBM, Sperry Rand Univac.

### 3.3.5. Personal Reference List

1. Computer installations in

    - Bulgaria (National Bank of Bulgaria, Trade Bank of Bulgaria)
    - Russia (IEO Serpuchov, Kamtschatka)
    - USA (Space Center Houston, US Army Monmouth, US Navy)
    - Switzerland (UBS Zurich, CERN)
    - Europe (HYDROMET, AEO, UNIDO)

2. Public network installations in

    - USA and Global (Centrex Service, Call Center Service, IN and AIN Service)

3. Contact center installations in

    - Austria (Master Management, Ökista, Mobilkom Austria, Connect Austria - ONE, H3G, Spardat, Easy Bank, Bawag, ÖAMTC, ÖCS, IBM)
    - Germany (IBM)
    - USA (University of Maryland, Span Link, AG Communication)
    - Global (AT&T Calling Card, SITEL, Convergys)
    - Greece (Patras University, University Network, 800-Service)
    - Croatia (HPT Croatian Post and Telegraph)
    - Bulgaria (BTC Bulgarian Telecom)
    - Romania (RomTelecom, MobilRom)
    - Saudi Arabia (STC Saudi Telecom)
    - Turkey (Türkcel, Koc)

# 4. Partnerships

## 4.1. Strategic Partnerships

Our strategic partnerships are mainly related to software development. Our aim is to provide proven software solutions for new and existing products. Please note, that we also provide development support for certain telephony products having exceeded end-of-life. For more information, please contact us.

Our current strategic partners are

- Sun Partner (formerly Sun IForce)
- SCO Development Partner

For more information on these partnerships or products developed in conjunction with, please refer to our web page at http://www.telecomm.at or http://www.telecomm.eu.

## 4.2. Alliance Partners

Alliance partnerships within BDD are based on the paradigma of biderectional communication and cooperation. Our partners help us to solve problems for our customers and vice versa. Our current alliance partners are

- Widder GmbH
- Nazca Software
- Telesoft Technologies
- Linkbit
- Patapsco Communications

More information and active links to our partners are available from our web page at http://www.telecomm.at or http://www.telecomm.eu.

## 5. Szenarios and Teams

BDD staff and partners are ready and prepared to team up with in-house work force and find solutions, fix problems or simply aid in every days work. To illustrate where and how we may become part of Your team we have collected some demonstrative scenarios, which we have encountered in the past.

1. Creation of RFP's - By evaluating the design and development position more in detail, a general solution direction could be found in most of the RFP's. An open system architecture with standardised application interfaces to "off-the-shelf" application software is the main target of these RFP's. A sample team is built from

   - a solution architect (covered by BDD)
   - in-house staff
   - dedicated external product specialists on demand

2. Creation of a technical specification based on standards and customer requirements - Examples include specifications for multimedia capable service platforms, call centres, CTI systems, public and private network systems and components. A sample team consists of

   - a protocol, standards and application platform specialist (covered by BDD)
   - in-house staff
   - dedicated external product specialists on demand

3. Design of voice and data infrastructure - This will contain physical connectivity definitions, logical addressing and routing requirements, intra / interworking specifications, transaction and application processing requirements. A sample team is built from

   - an infrastructure design architect (covered by BDD)
   - in-house staff
   - dedicated external product specialists on demand

4. Performance analysis and simulation of network or telecom equipment / systems - Examples include parameter tuning for voice over IP systems and call centre resource sizing. A sample team is built from

    - a performance analyst (covered by BDD)
    - a network and telecom specialist (covered by BDD)
    - in-house staff
    - dedicated external product specialists on demand

5. Protocol analysis and diagnosis of network or telecom equipment / systems including call generation - Examples include transport and application protocol analysis as well as BERT testing, call generation and evaluation in telephone networks. A sample team is built from

    - a testing expert (covered by BDD)
    - a network and telecom specialist (covered by BDD)
    - a performance analyst for evaluation of call generation reports (covered by BDD)
    - in-house staff

6. Reliability analysis of software architectures, network and telecom systems - By using mathematical and statistical techniques, exisiting or future architectures and systems are mapped to scientific models, which in turn will allow development of sample scenarios. A sample team is built from

    - a reliability engineer (covered by BDD)
    - a network, telecom or software specialist (covered by BDD)
    - in-house staff
    - dedicated external product specialists on demand

7. Cost justification studies - Existing and simulated architecture models often exhibit a black box type of character with respect to cost. By applying best of breed optimization techniques, hidden cost factors are revealed and classified. A sample team is built from

    - an infrastructure design architect (covered by BDD)

- in-house staff

8. Economic decision support - In summarizing hidden cost factors, weighted assessments, performance and reliability coefficients, one can provide a decision matrix to aid in defining the most efficient solution. A sample team is built from

    - a business economy specialist (covered by BDD)
    - a statistics expert (covered by BDD)
    - performance and reliability engineers on demand (covered by BDD)

9. Benchmark services - This includes the development and creation of benchmarking and data gathering processes as well as the definition of appropriate statistical methods for data aggregation and data analysis. A sample team is built from

    - a benchmarking specialist (covered by BDD)
    - a statistics and data analysis expert (covered by BDD)
    - in-house staff
    - software developers on demand

10. Pre-Sales support with respect to custom solutions - A sample team is built from

    - a solution architect (covered by BDD)
    - dedicated external pre-sales specialist

11. Provisioning support for new installations with respect to Avaya / Lucent Technologies equipment - This includes but is not limited to telephone switching systems as well as call centre, Voice-over-IP, unified messaging and IVR solutions. A sample team is built from

    - a solution architect (covered by BDD)
    - an Avaya / Lucent Technologies product specialist (covered by BDD)
    - in-house staff

12. Design and implementation of object oriented software architectures and solutions - Examples include but are not limited to CTI mediators and clients, data conversion platforms using latest Java / XML technologies, database front-end applications, interfaces and connectors. A sample team is built from

    - a software architect (covered by BDD)
    - in-house staff
    - software developers

13. Development and implementation of training courses - Topics may be tailored according to customer requirements, examples include courses for telephony signaling protocols, call centre engineering, switch resource engineering, data network protocols, voice-over-IP architecture and protocols as well as software development related aspects. A sample team is built from

    - a topic expert (covered by BDD)
    - in-house staff on demand

14. Testing and Integration of Third-Party and OEM products - This includes telephone switching systems as well as Call Centre, CTI, CRM, middleware, EAI and business intelligence architectures. A sample team is built from

    - a solution architect (covered by BDD)
    - in-house staff
    - dedicated external product specialists on demand

15. Evaluation of security aspects related to telephone and network components and systems - Examples include access right verification as well as fraud protection programs. A sample team is built from

    - a security and encryption engineer (covered by BDD)
    - a network and telecom specialist (covered by BDD)
    - in-house staff
    - dedicated external product specialists on demand

16. Web Design - By combining latest web technologies with professional layouting, single web pages up to complex navigation structures are developed from scratch or integrated in exisiting systems. A sample team is built from

    - a web designer (covered by BDD)
    - a layout specialist (covered by BDD)
    - in-house staff

17. Content management - Web based platforms allow for a powerful integration of information derived from different data sources. By using latest web technologies, a unified representation of data becomes possible. A sample team is built from

    - a database and web designer (covered by BDD)
    - a network specialist (covered by BDD)
    - in-house staff

18. Statistical modeling and analysis - Statistics has become a lively part of many technical projects. Whenever uncertainity arises, it may be challenged by classic approaches as well as the latest developments of the scientific community. A sample team is built from

    - a professional statistician (covered by BDD)
    - in-house staff with domain knowledge

19. Development and implementation of mathematical algorithms - Wide availability of high performance computing systems also raised the demand for numerical stable algorithms. Knowledge of high level math software integration and how it translates to the machine form the basement of a successful design. A sample team is built from

    - a professional mathematician (covered by BDD)
    - a math software expert (covered by BDD)
    - in-house staff with domain knowledge

20. Embedded systems design and development - Custom needs are best served by a combination of hardware and software. Applications may range from simple watchdog appliances to mainstream interface converters and processors. A sample team is built from

    - an embedded systems architect (covered by BDD)
    - a hardware specialist (covered by BDD)
    - software developers