

White Paper

# CreaLog Banking

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## Summary

CreaLog® Banking is a comprehensive solution for automated self-service completion of largely standardized, typical banking processes using natural speech communication over the telephone. It consists of a voice portal and special customized banking software. Round the clock accessibility for customers and the possibility of completing transactions quickly and easily anytime and anywhere not only contributes to customer satisfaction.

It also helps to reduce costs without detracting from the quality of service offered. The security and authenticity of financial transactions is mainly determined by the „HAVE“ and „KNOW“ elements. This is usually based on the natural speech input of an account number and Personal Identification Number (PIN). Alternatively, however, the „BE“ element can also be ascertained with a voice portal on the basis of a biometric procedure, whereby callers can be identified by comparing their voice print with a previously delivered speech sample.

As part of the international standardization of electronic payments using the IBAN and therefore more intensified use of SEPA payment instruments in the future, requirements with respect to automated self-service are also changing. To meet these requirements, CreaLog® Banking offers various solution concepts that can be used in line with the needs of each banking institution both for inputting and outputting the IBAN and BIC data fields.

The special benefit of this technology lies in the optimization of human resources and infrastructure costs. Employees can be freed from routine tasks and are thus available for higher-skilled jobs. Furthermore, use of CreaLog® Banking in particular means that those services that have very little or no value added are given a new meaning in the portfolio of the overall offer. Payback periods of less than six months can be achieved quite frequently.

### About CreaLog

CreaLog is a systems company with operations in 30 countries in Europe, Asia and Africa, which deals with the development and manufacture of voice portals. Its special competency lies in its ability to optimally align the components required for a successful voice portal from one source:

- **Voice Portal Plattform**  
with basic technologies such as speech recognition, speech synthesis and speaker verification (biometrics)
- **Voice User Interface Design**  
for dialog design, dialog optimization and performance monitoring
- **Integration of existing telecommunication infrastructures**  
(ACD, CTI, etc.) and IT structures (host, databases, CRM systems, etc.)

Our criterion for a successful voice portal is the successful use and acceptance by the caller. CreaLog guides you through the design, development and implementation of your voice portal solution. We have more than 15 years' experience in the area of financial services. CreaLog is certified under ISO 9001 and ISO 14001 and therefore fulfills an essential prerequisite for high-quality implementation of our clients' business processes.



## CreaLog® Banking

CreaLog® Banking is a solution for the automatic completion of typical banking processes using natural speech dialog over the telephone. It comprises a variety of modules that can be used to reflect bank-specific processes. These modules can be customized with ease to the specific requirements of individual banks and branches. One particular feature of CreaLog® Banking is the natural speech operation by the caller, which enables convenient and secure dialog guidance.

### Product description

Customers call the CreaLog® Banking portal and can execute their transactions there on a self-service basis. If necessary, the caller is supported by an agent and can then continue the automated speech dialog. This sophisticated coaching concept enables a continuous learning process that ensures maximum customer acceptance.

Customers are identified on the basis of their account number and PIN. Alternatively, the customer's voice can also be used to perform biometric identification. Because this authentication process runs without human intervention in the machine, maximum security and anonymity are assured for the caller. Even a caller who is put through directly to an agent can be authenticated securely and anonymously via the CreaLog voice portal and then automatically transferred back to the agent by the voice portal.

In addition to the modules for the most common services such as balance inquiry or querying latest transactions, CreaLog® Banking also offers special solutions such as payment instructions, transfers, standing orders and debit note rejection as typical banking transactions. Our customers' experience shows that high degrees of automation and potential savings can be achieved just with a solution that offers modules such as authentication, account balance, querying of latest transactions, PIN change, leave message and opening hours inquiry. After all, approx. 60% of callers only want information about their account balance.

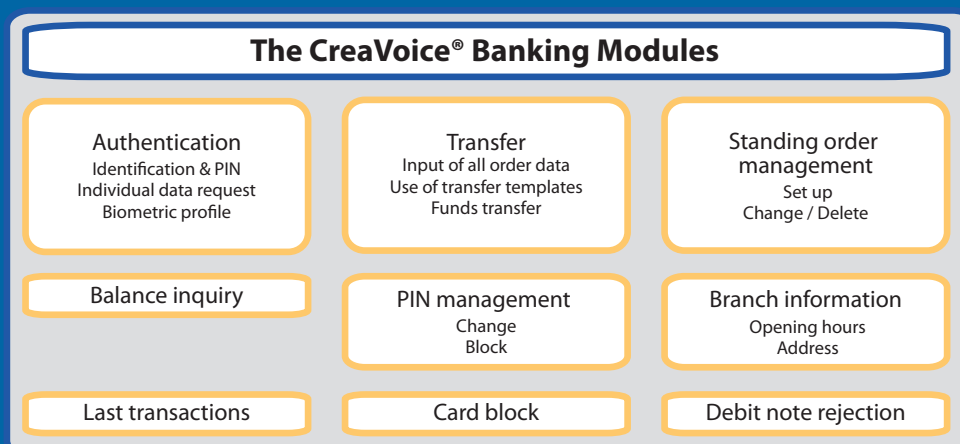
The modular structure of CreaLog® Banking enables wide-ranging adaptation to individual and bank-specific needs. In particular, small, cost-effective solutions can also be created for lower call volumes, which can then gradually be enhanced to increase the level of automation for executing transactions or for higher caller numbers and service levels.

A key benefit of the CreaLog® Banking product lies in its ability to adapt to the needs of very different sizes of company. Our list of references therefore provides a vivid picture of the diversity of the banking landscape.

### Natural speech operation

In terms of developing the dialogs, CreaLog attributes substantial importance to the design of the human-machine interface, the so-called voice user interface. This includes the dialog design as well as the elements of speech technology with speech recognition and speech synthesis as well as the interfacing with the backend, in other words with a call center, databases and other IT systems.

High recognition rates for individual input behavior also provide callers with confidence in the technology and thus promote the use of this automatic procedure. The CreaLog® Banking speech recognition module also takes account of personal preferences for stating number sequences in a specific way.



This means that individual numbers stated simply one after the other are recognized just as easily as randomly assembled blocks of figures. The same also applies to date and time inputs („eighteenth March two thousand and eleven“ or „eighteenth March two zero one one“ or „eighteenth March twenty eleven“).

The entered account numbers, bank codes, etc. are confirmed by the system during the course of the dialog. To facilitate the recognition of a chain of numbers entered by the caller, and to not unnecessarily force a rethink on the part of the caller, the numbers can be read back in the same way that the user has specified them.

### Customer Experience Management

Customer Experience Management (CEM) refers to the consideration of external influencing factors and usage situations in the dialog behavior of both the caller and the system. One feature of this, for example, is that different dialogs are used depending on the caller's situation. Customers who use the system frequently are served in so-called expert mode. If you are calling for the first time, or only very rarely, then novice mode is used. These two modes differ in terms of the detail of the menu and help prompts or, in the case of experts, also consider the frequency of the selected options.

Additional elements incorporated into CEM include information about whether a caller has recently received a letter from his/her bank and is now acting on it, or whether an unusual incident recently occurred (e.g. loss of debit or credit card). To take account of such circumstances it is essential that the speech dialog system is interfaced with the appropriate backend systems. Dialogs are also always characterized by emotional moods. Thus, for example, an unexpectedly low account balance can lead to a certain spontaneous response, a surprising use of funds or income to another. Responding to this in an appropriate manner is the preserve of a human communication partner. We have taken such situations into account with CreaLog® Banking when programming and stored the results as a lexicon in the speech recognizer. This allows the machine to also recognize the mood of the customer and respond accordingly. If it is deemed appropriate, it then connects the customer automatically with an agent.

This attractive form of dialog design gives the user a strong feeling of security and comfort. This not only facilitates the successful handling of telephone banking transactions, it rather also contributes to the further acceptance of your voice portal, because the bank customers will also communicate their satisfaction in their personal environment.



## The CreaLog® Banking Modules

CreaLog® Banking is modular in design. This means it allows the individual compilation of individual functions and can also be enhanced and adapted at any time through the addition of other modules. The following modules are available for performing the various actions with automated speech recognition:

### Authentication

There are essentially two different approaches to incorporating customer authentication in the automated dialog. In the first variant, users have to authenticate themselves before accessing the telephone banking service. Once authenticated they can then select the required action. This is the most widely used variant at present.

In the second variant, callers have to first select the function they require at the start of the dialog and only then authenticate themselves for this function if required. Thus, for example, authentication is not required for querying the opening times of branches. If the caller wants to transfer funds, however, authentication is required. This variant even allows a different authentication method to be used depending on the function selected in order to take account of the security required for the respective banking process.

Authentication is performed in most cases by entering an account number or customer number and a PIN known only to the account holder. Input is performed either based on voice or via the telephone keypad. It is immaterial in the case of voice input whether the caller enunciates the digits individually or in blocks. Alternatively, the identification can be performed by querying individual data such as birth date, zip code, etc. or biometric methods can be used for identifying the voice profile. Different security levels can also be implemented for the different transactions using these options.

### Balance inquiry / information

The system informs callers of their current account balance on request at any time. The account balance can also be announced immediately following authentication, assuming the caller's account is clearly identified.

### Last transactions

The last transactions feature can be used by callers to check their latest account activities. The individual transactions are read out sorted by date (most recent transactions first). The caller can "scroll" conveniently through the transactions using spoken commands. If, for example, the caller says the words "continue" or "back", the system will jump to the next or previous transaction. The transaction just read out can be repeated again by saying the word "repeat".

### PIN change

Authenticated callers can change their PIN at any time. The caller either enters the new PIN via voice input or via the telephone keypad. The system adopts the new PIN either following explicit confirmation by the caller or by entering the PIN a second time.

### Leave a message

This feature allows callers to leave messages for the employees of their bank outside the opening times of the call center. In this way, services can be ordered even outside the bank opening hours, which are not automated and can therefore only be performed by an employee. The prior authentication of the customer ensures that a declaration of intent specified in a message can be assigned to the caller unambiguously and in an auditable manner.

### Querying opening times and addresses

This feature allows you to check the opening times and addresses of each branch of a bank.

### Transfers

The transfers module allows the fully automatic processing of transfer orders. The caller goes through the following dialog steps in sequence:

- **Enter the recipient details (sort code, account number, name of recipient)**
- **Enter the amount to be transferred**
- **Enter the reason for payment**

The reason for payment can be stated either by using pre-defined usage categories, such as customer or invoice number, or alternatively by spelling it out. Speech recognition and keystrokes can therefore be combined arbitrarily in multimodal input. Input can be significantly expedited again through the use of transfer templates.

### Standing orders

The standing orders module is used for automated management of standing orders. The following actions are possible in this context:

- **Set-up: Information, such as for a transfer, and additionally execution date and interval**
- **Change**
- **Date-specific deletion**

### Debit note rejection

The debit note rejection module allows defective or unauthorized debits to be returned. The caller can search for the debit to be returned in this case using various criteria, for example based on the amount.

## SEPA and IBAN in CreaLog® Banking

The use of the IBAN (International Bank Account Number) will become mandatory over the next few years as part of international standardization of electronic payment transactions. The SEPA (Single Euro Payments Area) payment instruments that are already in use are already working with the IBAN and BIC (Business Identifier Code). The statutory obligation in the future to use the IBAN means that the SEPA process will become much more widely used.

A key data element in this context is the IBAN, an alphanumeric string that uniquely designates an account internationally. An IBAN is between 16 and 34 positions long; the first two positions correspond to the alphabetic country code (e.g. DE for Germany or TN for Tunisia). These are followed by two check digits, while the remaining positions are country specific, though the IBAN of a country always has a fixed length.

### Recognition of IBAN

CreaLog® Banking has a standard module for identifying IBANs. Format information is also used here to optimize the recognition quality. An individual grammar exists for each country for exact, country-specific formatting. The first two positions of the IBAN must form a valid country code. These are then followed by two digits for each country. The positions at which only digits, only letters or digits and letters are allowed are defined individually for each country. This also impacts the grouped input of digits. If in the case of a particular country the first position after the check digit has to be a letter, the country code may be followed by a maximum of two digits or a two-position number, but never a three-position number.

This structure information is used to support speech recognition. Experience with this procedure for the detection of other alphanumeric data shows that satisfactory detection rates can be achieved in this manner.

Alternatively, it is also possible for a certain transitional period, for example, to identify the IBAN in a multi-stage query. Thus the caller is first asked for the country and then the country-specific parts of the information. If necessary, the check digit can be calculated and thus the IBAN can be composed automatically. Suitable programs are already available on the Internet, see for example <http://www.ibancalculator.com/>.

### The role of the IBAN in telephone banking

The IBAN is relevant and used for the following functions in automated telephone banking, either as an element that the caller has to enter, or as part of the system output:

1. Authentication
2. Transfer
3. Standing order
4. Direct debit
5. Scheduled transfers
6. Last transactions

### IBAN in the context of authentication

Institutions that already use customer numbers or login names and not account numbers for authentication need not make any changes here. For institutions where registration is performed on the basis of an account number, it depends very much on how exclusively the IBAN prevails in customer communications. If this is the only feature used to designate the account, the recognition module mentioned above can also be used for authentication purposes. In this case you can make use of even more structural information, since the value of the bank code in the IBAN is known. If you use other data elements in the course of customer communication (e.g. card number, birth date, zip code), possibly also only as an alternative, these elements can be integrated and queried simply and easily in the telephone banking dialog.

Voice verification is an innovative biometric method used for identification and authentication. Today it is technically easy to use the caller's telephone number that is transmitted as a means of identification and also to ask for information such as zip code and date of birth in order to perform authentication by means of voice verification. The particular telephone banking services that require authentication in the first place must also be checked. Authentication is not required for pure information services such as branch details, ATM finder, etc. Weak authentication may suffice under certain circumstances for other services, such as sending information material or exemption applications. CreaLog has already implemented this in some projects. Possibilities for this include card number and zip code and birth date or a range of defined questions with appropriately configured replies.

Such considerations lead to replacement of the well-known and widely used approach in phone banking - welcome, authentication, services - with a new structure - welcome, services, authentication. CreaLog® Banking supports this new paradigm by performing the authentication required for a selected service, if this has not already occurred.





### **IBAN in the context of transfers / standing orders**

If customers want to enter a complete IBAN for transfers and standing orders, the IBAN standard module offered by CreaLog can be used. Gradual input is also possible here. The caller is generally first asked whether it is a domestic or foreign transfer. In the latter case, the caller is then asked about the country and then prompted for any missing data on a country-specific basis. It remains to be seen again, which data will prevail in communication with customers. For example, if complete IBANs usually prevail and the customer has to deal with this, input by means of a standard module is the recommended route. If „conventional“ data is still relevant for communication, then gradual input is a possible alternative.

### **IBAN in the context of standing order management and debit note rejection**

The IBAN can be used as a selection criterion for managing standing orders and debit note returns. Complete input of the IBAN should again be performed using the standard module. Alternatively, shortened forms can also be used. For example „direct debit from France“ refers to all direct debits where the IBAN commences with „FR“.

### **Output of IBAN**

The output of an IBAN is used for information on last transactions, possibly also for navigation purposes to select from lists of standing orders and direct debits. In this context, the IBAN can either be output as an alphanumeric sequence or its parts are explained additionally.

### **The IBAN during the transitional period**

As long as the IBAN is still not an integral part of communication with banks, it makes sense to use the voice portal as a means of drawing attention to this new data element and raising awareness for it among bank customers. For example, a very simple add-on function is available in CreaLog® Banking, which allows the relevant IBAN to be output for one's own account. Another option is to basically offer the opportunity to have the relevant IBAN announced at all points in telebanking where account data is used, whether the caller wants to hear the IBAN when the last transactions are being read out or this data is also announced when a transfer is being executed.



## Collaboration with your employees

CreaLog® Banking is integrated optimally in the business processes of the bank and therefore naturally also supports the forwarding of the call to colleagues in the contact center. It is vitally important in the context of forwarding that all data collected to this point is made available to your employees in order to save the caller having to repeat data already provided. It is also relevant for your employees that they have all necessary data on hand, preferably via a user interface, and can activate the required functions directly.

CreaLog® Banking offers various options for cooperation between speech dialog and your employees. On one hand, the required data can be sent via an interface to the system used in the company that the bank officials work with. On the other hand, CreaLog can implement an agent frontend that is tailored to the special requirements and processes of the company and that supports the employees when processing calls. Control elements for various functions of the CreaLog platform can be integrated in the CreaLog frontend (e.g. logging), but also the functionality of other systems if need be, for example Automated Call Distribution (ACD).

### The coaching concept

CreaLog® Banking offers bank customers extensive support for performing their various transactions on the basis of specific error and help announcements. Should the caller nevertheless experience difficulties in using the system, the voice portal will transfer the caller to an employee. This bank employee is shown the necessary information on his/her monitor by the voice portal by means of the backend integration and CTI coupling. The bank employee will know the precise point in the dialog the caller was at, which data he or she had already entered and where difficulties arose in the automatic dialog. In conversation with the customer, the employee can determine the resulting input problem and give the caller specific tips for operating the system. When the conversation with the employee is ended, the caller can be reconnected to the voice portal if required and can continue the dialog at precisely the point where it had previously been abandoned.

## Advantages and benefits

In terms of investments, the financial services sector focuses on optimizing human resources and infrastructure costs. At the same time, the aim is to ensure efficient customer communication and customer satisfaction through an excellent service offering.

This is where the CreaLog® Banking system demonstrates its benefits and advantages.

### Advantages

- Accessibility of the self-service offering around the clock - even outside of business hours and on holidays
- No wait times for customers
- Use of telephony as a familiar, most common means of communication
- Mobile accessibility anywhere and anytime
- Broad acceptance of the medium especially by older audiences
- Suitability of the same system for both novices and experienced power users alike
- Intuitive, user-friendly handling
- All key functions are accessible via the voice portal
- High security and anonymity for customers
- Consistently congenial and friendly dialog management
- If required, easy to change between human and machine
- Modular design of the technology according to the different bank-specific requirements and organizational weighting

### Benefits

- Simple separation between the standard call and qualified request without loss of quality
- Simpler standard processes can be automated through the voice portal and in this way do not burden daily operations
- Employees in call centers are relieved of routine tasks and can be used for more skilled tasks such as consulting and sales
- Elimination of personnel costs for defined first-level services, which usually do not offer high added value
- Significant reduction in contact costs (typically about EUR 4 for a call to an agent compared with EUR 0.10 up to EUR 0.15 for a conversation with the voice portal)

## Backend integration

The CreaLog® Banking Suite represents a convenient telephone frontend for all data processing systems in a bank. With its extensive knowledge in the field of customer-driven banking processes, CreaLog can adapt the interfaces of its powerful telebanking frontend meaningfully to the individual needs of your organization.

Based on many years of collaboration with leading PBX and ACD providers, CreaLog can ensure fast and reliable integration of CreaLog® Banking systems in telephony, ACD and CTI environments. There are reference customers for virtually all the major telephone systems in Europe. Certifications offer additional investment protection.

Apart from the standard ODBC / SQL and XML / SOAP interfaces, numerous connectors exist to the most important interfaces of banking computer centers for IT integration of CreaLog® Banking solutions. New connectors can be custom produced quickly and integrated into the banking solution

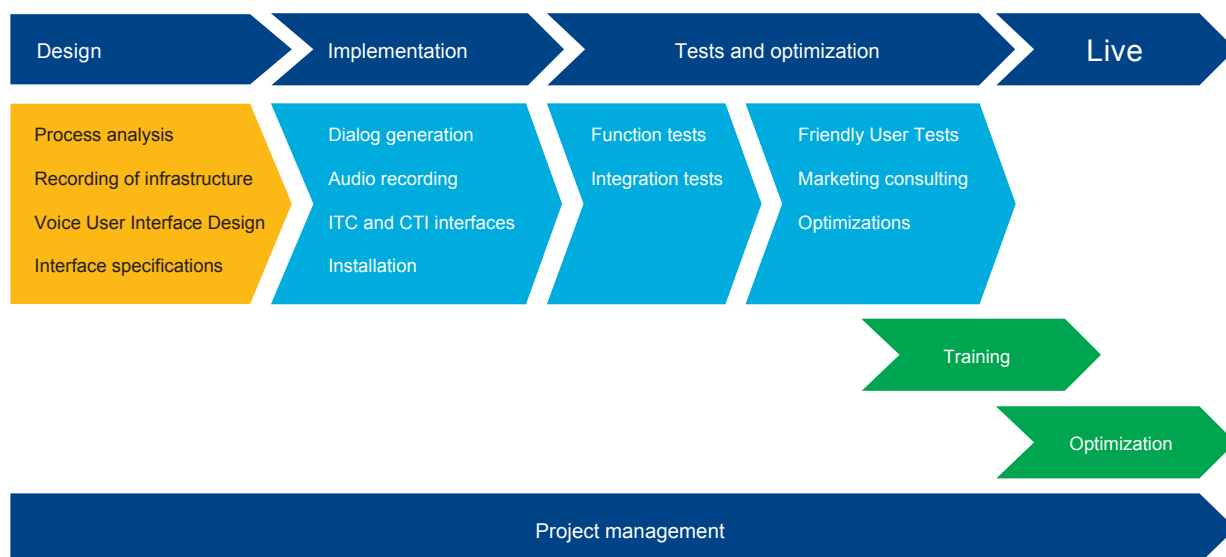
## Professional Services

Apart from our CreaLog® Banking Suite modules, which have already proven their excellent quality and proficiency in numerous projects, we offer you comprehensive services and support services for your project for implementing and rolling out your voice portal in order to ensure the success of your solution.

The relevant CreaLog experts are on hand to support you with all tasks, offering you extensive know-how that has been proven in projects.

This extends from our experts in the area of dialog design and voice user interfaces to technology experts in the field of speech recognition and speech synthesis to specialists in the field of integration and infrastructure. Our professional services ensure the success of your voice portal from the very outset while our consultants are on hand to advise you in relation to process and potential analysis. Our system integration, our complex customizing services and our solution-driven consulting ensure that you

get a product that is perfectly tailored to your needs and harmonized with your communication strategies. Our project management will accompany you throughout, ensuring smooth communication and thereby the success of your voice portal project. In a classic scenario, a project also includes training and monitoring of the implementation of your CreaLog® Banking solution to ensure acceptance by callers and smooth operation in your company. Even after the go-live, our experts are pleased to continue supporting your voice portal. At your request, we conduct periodic performance analysis, propose improvements and enhancements and are also pleased to implement these.



## About CreaLog

With references in 30 countries, CreaLog is the leading provider of speech dialog solutions in Europe. The CreaLog VoiceXML platform can be administered fully from the web and is used by more than 400 customers in more than 30 sectors – with a total of some 60,000 installed lines. Its users include banks and insurance companies, utility companies and public administrations as well as telecommunications and media enterprises.

Voice portals from CreaLog ensure optimum dialog quality based on natural language speech recognition. They can recognize and intelligently process a large number of words and entire sentences in more than 44 languages. In addition, CreaLog portals support the very natural-sounding speech synthesis of leading global providers.

The CreaLog voice portal, unified messaging and CTI solutions for carriers and corporate clients have been awarded the „Best of CeBit Award“ on many occasions – including for „Interactive Voice Video Response“ and for the natural language information and FAQ solution „CreaLog FAQ“.

The telephone banking solution of the HypoVereinsbank, which was implemented by CreaLog, won the Voice Award as „Best Enterprise Services“ and the intelligent taxi service „Cabfish“ likewise received a Voice Award as the winner of the Voice Contest. „ELVIS“, the voice-controlled Internet radio for mobile devices, won a silver award. In addition, CreaLog telephone banking was honored many times with the „Bank Marketing Award“. The „Best Bank in Customer Service“ award was bestowed upon the Sparda telephone banking solutions at Sparda West eG as well as Sparda Nürnberg eG, likewise the Kreissparkasse Esslingen-Nürtingen solutions.



We would be pleased to inform you about the CreaLog solutions and the resulting potential for your company.

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We support you expertly and enthusiastically through the decision-making process right up to implementation, commissioning and optimization.

We look forward to meeting you!