Increasing Productivity in New Ways
With Artificial Intelligence

HUMAN INTELLIGENCE AUTOMATION ®

Instaknow technology is protected by U.S. patents 6732102, 7073126, 7437342, 7979377, 9443005 and pending patents
I. Executive Summary

THE CHALLENGE: INCREASING AN ORGANIZATION’S PRODUCTIVITY WHILE REDUCING COSTS

Global competition is forcing most organizations to do more with fewer resources. One well known approach to increased productivity and cost reductions is automation of repetitive business processing to eliminate manual work. Reduction of unnecessary human intervention in business processing reduces the need for hiring and training staff, resulting in operational cost reductions and an “Agile Enterprise” with rapid and accurate responses to problems and opportunities, especially when dealing with exponentially growing data volumes.

CURRENT PROCESS AUTOMATION TECHNOLOGIES: BPA AND RPA

With technologies like “Business Process Automation (BPA)”, a new, integrated “collaborative” layer of composite business rules can be deployed across multiple systems to automatically control each system’s actions. Another technology “Robotic Process Automation (RPA)” allows software “bots” (robots) to repeat pre-taught actions across user interfaces of diverse systems, doing the same work as a user does.

However, in reality, BPA is expensive and time-consuming because it requires every system to be reengineered to make it XML-enabled. RPA is not useful for high-volume complex processing because it BLINDLY repeats pre-taught actions, and is unable to handle even minor variations in data layout/formats in user-interfaces or documents, making it error-prone and unreliable. Lastly, both BPA and RPA lack the “fuzzy” intelligence that people can apply to solve the business problem.

A NEW APPROACH: HUMAN INTELLIGENCE AUTOMATION®

Instaknow.com, Inc. has developed a real-time process automation platform, the Instaknow-ACE® (Active Collaboration Engine), that “overlays” integrated business processing on top of current systems and data sources, while retaining much of “Human-like” data awareness and flexibility. This is a far more cost and time effective way of deploying the benefits of process automation than BPA or RPA, because it requires no changes to systems, procedures, policies or documents; and can quickly and RELIABLY displace cost of manual work being done by hundreds of people.

Instaknow-ACE ® is powered by patented Artificial Intelligence (AI) to follow business case examples shown by an authorized user via a point-and-click graphical “design” interface. All system/data interactions used in these initial examples are automatically used by Instaknow-ACE for future automated execution of similar business transactions; with the unique ability of automatically adapting to infinite variations in locations of data-of-interest, which might exist between the examples and the actual transactions.

It can interact in real-time with any number of hard-to-integrate data sources like Web sites, portals, SaaS solutions, Screens, documents, e-mails, attachments, just like a user would. Using friendly “point-and-click” graphical interfaces, any level of business intelligence (rules and decisions) can be added across the multi-system reads/updates to intelligently execute the automation based on run-time conditions. It automatically detects, reports on and handles all processing exceptions as per desired rules.
Working like many automated, expert users, Instaknow-ACE processes hundreds of complex business transactions in a minute, rather than days taken by people, while following every rule and policy you ask it to follow. Built-in “fuzzy matching” capabilities allow for correlation of even non-exact information across systems in a highly reliable manner. Audit trails are kept as desired and all existing security policies of all systems (digital certificates, passwords, LDAP based roles etc.) are honored automatically. The processing can happen as desired - triggered by users, invoked by other authorized system on demand, according to schedules or in a continuous mode till stopped by an authorized user.

INSTAKNOW MAKES IT SIMPLE

Instaknow Automates Complex Processing with Human Vision-like Scans of All Data

**SEARCH** Capture

**DISCOVER**

- ERP, CRM, BI, SOA, Legacy, EDI, RSS, DBMS, Web Services, XML
- External Web Sites, Legacy System Screens
- PDF, Excel, Word, Email, CAD/CAM
- Web Searches, Deep Web Mining, SaaS, Web 2.0, Blogs

INSTAKNOW PROVIDES SMART AUTOMATION ACROSS ALL SYSTEMS

**ANALYZE**

**PROCESS**

**CONCLUDE**

System agnostic - No changes to internal or external systems!
Processing can run on-demand by users, systems, schedules or continually.
Real-time Processing, Reduced Cost, Increased Productivity.

**UPDATE**

**PUBLISH**

**ALERT**

- Update Systems Public, Remote
- Publish Web Pages, Reports, Twitter
- Send Alerts, Email, IVR, SMS

Automated processing **WITHOUT** cost of re-programming every system * Rapid I2B
UNIQUENESS

Combining all capabilities of an advanced programming language AND those of many well-trained, expert business users, Instaknow’s “Human Intelligence Automation” is distinctive because it is

- Designed for enterprise-class, high-volume parallel processing and multi-machine-load-balancing, to deploy mission-critical, high-volume operations, capable of processing millions of complex business transactions per month using only 2-3 standard machines, with built-in redundancy and fail-over.
- Does not require programming – Instaknow programs itself automatically from the external system interaction examples you choose to show, adapting to each system’s unique data content, format and navigation. You can also add cross-system business decisions (business rules) via a point-and-click graphical interface to make the automation as intelligent as your expert business users, including exception handling.
- Easily links to all data - Reads-updates normal enterprise data sources (Databases, SOA, EDI, APIs etc.) as well as hard-to-integrate, unpredictable-layout sources (Web sites, portals, SaaS, Excel, Word, PDF, e-mails, attachments, mainframes, AS400 and other legacy systems). All natural languages are supported.
- Automatically adjusts to infinite variations of data-of-interest, e.g. data location/format changes, like an electronic “eyeball”, making it radically more reliable than blind RPA bots. E.g. it can accurately isolate and read specific required data from complex web pages and documents, regardless of unknown Web page layouts, document page order, unpredictable paragraph sequence, varying data location within a page etc. It is also color/font sensitive and can apply color-based business rules like “Purchase Orders in bold text with yellow background need cross-verification with ERP invoices”.
- Processes complex business transactions with broad awareness, e.g. in a single transaction, data from three emails, five browsers, three Excels and two PDFs – can be correlated (and updated, if required) in real-time, just like a trained user would do. And multiple of such multi-source transactions can process at the same time from a single machine, drastically reducing the number of machines required for automation.
- Applies multi-parameter “fuzzy matching” intelligence to find same or similar information with reliability of an expert user.

BUSINESS BENEFITS OF A INSTAKNOW-POWERED HYPER-CONNECTED SOLUTION

- Faster business processing at reduced operating costs. Millions of business transactions can reliably be automated per month.
- Leverage value of and investment made in existing systems without costly technical changes.
- Provide straight-through processing with internal and external partner, customer and supplier systems.
- Reduce manual data lookups / research / data entry / errors / corrections / re-do’s / customer complaints; resulting in higher quality and performance. Free staff for higher-value tasks.
- Drastically reduce system integration costs and traditional delivery times.
- Bring enhanced product/service offerings to market faster than before.
- Provide solutions to business problems previously considered too costly, time prohibitive, unrealistic or impossible to achieve.
TYPICAL SCENARIOS WHERE INSTAKNOW-ACE PROVIDES RAPID PAYBACK

- High transaction volumes spanning fragmented systems with heavy manual intervention in business flow.
- The market demands faster responses, but the current manual business process is too slow.
- Must offer new, innovative business solutions to market to gain competitive distinction and market share.

Instaknow’s enterprise-class solutions have been deployed in many industries. Solutions include:

- Accurate ingestion and data-extraction from complex, multi-page documents, e.g. tax returns, contracts, regulatory filings, loan applications
- Legal – automated processing of complex summonses, petitions, affidavits, judgments etc.
- Banking – regulatory compliance (e.g. RESPA and TILA)
- Global Supply Chain Management – high-volume tracking of Containers, Arrival Notices, Bill-of-ladings, Customs forms
- Integrated Procurement
- Integrated Risk Analysis
- Pharmaceuticals – drug ingredients pedigree quality assurance for FDA compliance
- Human resources – matching resumes to job openings
- Blog and Social Media monitoring and trending analysis, lead generation
- Automated monitoring of search-engine accuracy
- Integrated Battlefield Command and Control
- Integrated Emergency Response Coordination

In every case, the business processing goals are met faster by reducing unnecessary manual intervention, achieving dramatic cuts in operating costs, attaining new levels of productivity and expediting decision-making. This leads to a unique competitive edge, decision and action superiority and market distinction with generation of greater profits and revenue, optimization of resources, and enhancing advantages across the value chain.

Instaknow-ACE® “Human Intelligence Automation®” Technology

FEATURES

A. INSTANT CONNECTIVITY TO MULTIPLE SYSTEMS FOR SEAMLESS, COORDINATED, REAL-TIME ACTIONS

The Instaknow-ACE links to virtually every electronic system, document and database found in a large organization or within the Extended Enterprise using the Internet. Instaknow-ACE can take intelligent, conditional and coordinated actions on all corporate data sources and systems. By just clicking on visual wizards, a trained business analyst can define custom business rules that can read and update data, make real time decisions and take actions across a wide variety of systems. They include reading and writing data and taking actions on Internet/Intranet sites, Legacy systems (mainframe/AS400/VT), Relational databases (Oracle, MySQL, SQL Server, DB2 etc.), ERP systems (SAP, Oracle etc.), EDIs, GUIs of client-server applications, XML/SOAP web servers, JSON, custom APIs, files, spreadsheets, WORD, PDF, CAD and Visio diagrams, MS Project plans, images (using OCR), faxes, sensors, e-mails and voice mails (using IVR).
The output result from Instaknow’s processing can be fed immediately to other system/servers for further processing. Applications can also be instructed to seek and wait for human intervention/response when required. No change is needed to the existing systems, applications or business processes.

B. VISUAL WIZARDS. NO NEED FOR PROGRAM CODING TO DEPLOY BUSINESS RULES.

The Instaknow-ACE design environment offers a full feature IDE (Interactive Design Environment) with smart visual wizards to allow authorized users to quickly convert ANY business intent into Business Process Automation instructions. Custom business rules, however simple or complex, can be deployed with a few clicks of the mouse. Each wizard step accomplishes the work equivalent to thousands of lines of conventional code. The developer validates (debugs) the business rules with a built-in testing facility, including “break-points”. Extensive context specific on-line help is available with each wizard. Point-and-click cut/copy/paste and “import” facilities are available to quickly change the business rules when the business requirements change. No knowledge of a programming language is needed to use the Instaknow-ACE wizards. Many of the wizards have artificial intelligence that can “auto-discover” and “auto-execute” steps of a complex business process, as guided by the user. No additional technical tools or environments like Visual Studio .NET or J2EE are required.
An example of an Instaknow-ACE wizard used to automatically locate and capture real-time information from a Web page is shown below. The wizard automatically adapts to changes in position of data of interest on the web pages and detects errors like “Web page was missing some data” or “Web-server did not respond in allocated time for that step”, etc.

C. INTELLIGENT ORCHESTRATION USING “ADAPTIVE ARTIFICIAL INTELLIGENCE” AUTO-DISCOVERY

Instaknow’s advances include artificial intelligence that learns from business case examples shown by a user to auto-discover and remember what data is relevant to each business transaction. The learned intelligence is then automatically applied to similar business cases from that point on, automatically putting transaction specific real-time data in any HTML (Internet/Intranet), green screen or client-server application and automatically clicking on the correct links and buttons. When the other application responds, the data of interest is automatically located, extracted and is made available to the subsequent steps of the business process for further actions. Essentially, this advance allows leveraging all current client-server, green screen and HTML based transactions as if they were a Web Service, but without the need for costly XML re-programming of that functionality. If the screen or document layout changes between the time the interaction was designed and its later run-time execution, Instaknow-ACE wizards automatically apply artificial intelligence driven pattern-matching algorithms to re-discover the new location of the data of interest. The wizards automatically handle variations like unknown page order, unknown paragraph sequence, unknown wrapping of text, longer/shorter paragraphs and more/fewer rows in tables, unknown column sequence in a table/grid etc. The source systems and documents can continue to evolve/enhance freely. Instaknow-ACE is the most effective solution for reliably converting unstructured documents into formal structured data.
Security and permission mechanisms (single sign-on, PKI, digital certificates, user ids/passwords) are automatically honored. No program coding is needed to implement these advanced solutions. If a true XML Web Service happens to be available, other wizards enable bi-directional interactions with the service.

Another advantage of doing “human-like” processing via existing application front ends is overcoming a major flaw in “stateless” or “single-request, single-response” protocols like SOA, which have no memory of any prior interaction with any system. By automating interaction with an application screen, Instaknow can enter partial data in several application windows just like a human user, based on application messages returned (e.g. “Please provide missing data for highlighted fields”), look up that additional data from other sources or applications, and then complete the screen data entry in all systems. Such electronic “swivel chairing” across multiple data sources is required for many complex business transactions and is impossible in stateless protocols using XML/SOA.

D. COLOR/FONT SENSITIVITY

Instaknow detects not only the data content in documents and screens; it also detects the data text color, background color, font style and font type. This allows for human-like business rules, e.g. “Ignore grey cells in the grid in the Excel” or “Red items in the Purchase Order are for urgent dispatch, order parts with expedited delivery from the fastest supplier”.

E. INTELLIGENT AUTOMATED WEB SEARCHES (WEB MINING) AND DOCUMENT SEARCHES (DOCUMENT MINING)

Instaknow-ACE includes features that perform nested, multi-level, customizable and closed-feedback-loop Web searches to discover and retrieve fine-tuned information and integrate it seamlessly with in-house corporate data. In addition, multi-site “Deep Web” searches with compound inclusion and exclusion criteria can be auto-launched using the Instaknow-ACE as per user specified business rules. Additional capabilities analyze the combined in-house and the web-based knowledge; and automatically take intelligent actions on multiple internal/external systems. All these steps are controlled by business rules, rather than a programmer's code. It allows trained business users in any industry to create customized Web integration/interaction solutions. The search wizards automatically apply user supplied preferences about inclusion and exclusion criteria, pattern of phrases, distance between phrases, distance of phrases from top of the document, number of occurrence of phrases; “fuzzy” (i.e. similarity) matches etc. The searches can also be applied to documents on LAN/WAN file systems to identify documents containing specific information (e.g. find a PDF that has “repair instructions” in title, contains the phrases “radar” and “submarine” in the same paragraph, and was modified in the last 30 days). Once found, the entire document or the desired sections of the document can be sent as e-mail attachments, published as HTML or XML, stored in databases and fed to other applications automatically.

F. MULTI-LANGUAGE PROCESSING

Instaknow-ACE has embedded Unicode features that allow inclusion of multilingual capabilities required by today’s global businesses. Foreign language web/document data can readily be read/matched/written in the processing.
G. UNIQUE ADVANCED FEATURES

Additionally, Instaknow-ACE offers wizards with extremely useful advanced features that are not found in any other programming language or protocol. Examples are “self-updating” applications, advanced multi-language web searches based on custom dynamic criteria, auto-detecting locations of transaction-specific useful information in Excel, WORD, PDF documents, automated comparisons of disparate system data to identify similarities and differences (e.g. automated audits), and “fuzzy” or non-exact matches of short and long strings.

TECHNOLOGY DEPLOYMENT—MULTI-SERVER LOAD-BALANCING ARCHITECTURE

Once modeled (or modified) using the visual wizards of the "designer" modules, Instaknow-ACE application business rules are saved automatically as encrypted XML files. The business logic saved inside these XML files can be executed immediately by an Instaknow supplied "Rule Execution Engine". No programming steps like compiling or registering components are necessary to activate the business logic. The "Execution-Engine" software can be installed on any machine with a Microsoft Windows 64-bit operating system (i.e. Windows 2012, 2016, 7, 10). These machines can be virtual and/or in the Cloud if desired. Therefore, any business process automation application can be deployed on ANY Microsoft 64-bit OS machine just by copying the Instaknow application XML file to that computer, if the "Execution Engine" is present on that computer. This "application as XML" paradigm allows instant remote application deployment, fixes and upgrades from anywhere in the world over the Internet by transferring the application XML file via FTP, as an e-mail attachment or simply as a file-system file copy to the destination computer over the LAN/WAN.

The saved applications can be triggered by an authorized external application sending a “request” to an Instaknow work queue, via Web Service protocols, via a direct "call" from client-server applications or via an Instaknow supplied scheduler for repeated execution at a certain repeated frequency. Instaknow-ACE architecture allows synchronous (real-time response) or asynchronous transactions. The requests for these transactions are added to "processing queues" by the "requestor" applications. The entire multi-step workflow definition can be created and modified by just configuring visual wizards.

To process the requests arriving in the work queues, any number of Instaknow-ACE "execution engines" can be started on one or more CPUs and one or more servers. Since the "execution engines" work in parallel, they can be started and shut down on the fly, without interruption to the processing because other engines continue to pick up the workload for that queue automatically.

This architecture allows unlimited scalability (by simply starting more "execution engines", optionally adding more servers when needed) and fault-tolerance/redundancy (by simply ensuring that some of the "execution engines" dedicated to a given queue are running on geographically distributed servers that are likely to remain active when other servers go down). A “Controller” console shows a real-time graphical view of the entire synchronous and asynchronous workflow execution. All components are protected by "role based" user id/passwords.

SECURITY OF PROCESSING

• Instaknow’s processing is as secure as the rest of the customer’s systems. Instaknow-ACE Execution-Engine runs on standard Windows machines that are physical or virtual and reside at a location (data center or cloud) of the customer’s choice.
• Instaknow uses the customer-specified processing rules as reviewed and authorized by the customer. The rules and processing are always in the customer’s control and can be stopped, started or changed at any time by a customer-authorized person.

• All current security protocols (SSL, PKI Certificates, Single-sign-on, RBAC, logins-passwords) of all networks, servers, databases and Web sites are automatically honored by Instaknow’s user-like access and processing. They cannot be bypassed.

• Instaknow’s automated processing uses customer-specified logins and passwords to access required networks, servers, databases, Web sites, documents and systems. These logins and passwords are kept in an encrypted data store of the customer’s choice, typically an encrypted Relational Database table or a password protected Excel, where they can be maintained by a customer-authorized administrator (e.g. changing passwords when they expire). Instaknow reads the login details from this encrypted data store, decrypts them briefly, uses them like a person to log-in into the systems and immediately discards them from its memory. The passwords are never visible or accessible to any person or program.

• Instaknow’s automation rules and examples are automatically encrypted using industry-standard, AES-256 bit encryption. They cannot be read or modified by any other software except Instaknow. All Instaknow software modules are password protected. Different passwords can be set for different rule-sets.

• Many government agencies and Fortune-500 corporations have deployed Instaknow solutions after thorough security validations.

ADDITIONAL ADVANCED FEATURES AVAILABLE WITHOUT PROGRAMMING

Using additional Visual wizards, all applications built with the Instaknow-ACE allow:

• Open Extensible Architecture - Real-time bi-directional interaction between Instaknow-ACE applications and programs written in all conventional programming languages, third party software, stored procedures.

• Operations in real-time request-response, event-based, triggered, scheduled or continuous modes.

• Point-and-click ability to specify complex comparisons, calculations, summarizations, aggregations on all available data sources. Built-in support of “Regular Expressions (REGXP)” and “Fuzzy Match” comparisons.

• Remote deployment by simply copying application flat files to destination computer, enabling fast scalability and simple Disaster Recovery Planning (DRP).

• “Self-updating” applications that automatically “refresh” themselves with updated “master” versions of business workflows and rules, if desired. Both “push” and “pull” updates are possible.

• Real-time transaction control - locks, rollbacks, commits on relational databases.

• Permission/authorization controls for user ID using “roles”.
• Encryption for all application logic and passwords, making it impossible for anyone to steal business intelligence or data. Compatibility with SSL, digital certificates, Single-sign-on protocols and PKI.

• Easy and flexible application migration and version control. Since Instaknow ‘applications’ are simply XML files, they can be migrated using ANY migration and version control mechanism of the customer’s choice.

• Choice of “stateless” or “persisted state” executions for any business logic thread.

REASONS WHY SYSTEM “OWNERS” WELCOME INSTAKNOW-ACE

• Instaknow is non-intrusive and does not require change to existing code or existing application logic.

• Using Instaknow, system owners do not have to dedicate time, resources, or budget to allow their systems to collaborate with other systems.

• Because there is no change to existing systems there is no risk with an Instaknow deployment. If Instaknow is removed, the systems remain as they were before.

• Instaknow breathes new life and value into existing systems and applications investments by leveraging their current functionality as part of collaborative solutions.

• Systems can continue to evolve/enhance freely. Instaknow’s "auto-adapting loose-coupling" paradigm allows the interoperability with the systems to be configured before and after the system modifications just by clicking on wizards.

• Instaknow's non-intrusive integration approach does not require any Instaknow component to be installed on systems that become Instaknow integrated.

• Instaknow honors the same access privilege mechanisms (e.g. roles) that control and restrict any user.

• Instaknow provides an audit trail of all automated actions.

• System owners can collaborate with one another without the time, effort, risk and cost of coded integration with other systems.

EXAMPLES OF INSTAKNOW-ACE® COLLABORATIVE VALUE IN VARIOUS AREAS OF COOPERATION AMONG MULTIPLE ORGANIZATIONS:

• Emergency / terror-attacks detection and response
• Order Entry and Fulfillment
• Web and document mining to automate research
• Promotions Management, Marketing Automation
• Product Life Cycle Collaboration
• “Sentiment Tracking” on Web Blogs
• Planning and Forecasting
• Meta catalogue/Content Management
• Risk Management
• Reverse Logistics
• Scrap Processing
• Integrated, Multi-vendor Processing
• Complex Pricing
• Inventory Availability

• Sourcing of Products
• Transportation Management
• International Trade Logistics
• Contracts Management
• Regulatory Filings
• Scheduling
• Asset Management
• Electronic Bill Presentment and Payment
• Performance Management and Benchmarking
• Payment Reconciliation
• Interactive Online Selling
• Application Hosting
• Digital Certificate Management
• Clearing Services
• Inventory Availability
• Payment Processing
• Bill of Material Explosion/Confirmation
• Feasibility Modeling and Scenario Planning
• Market Intelligence
• Wire Services
• Quick Pay Services
• Private-Label Exchange Services
• Integration with Back-End Systems
• Specialized Market Making
• Affinity Programs

• Clearing Services
• Carrier Notification and Acknowledgment
• Procurement Workflow Rules
• Derivative Instruments
• Profiling of Customers to Market Segments
• Links to Other Exchanges
• Uniform Customer Entitlements/Anonymous Inventory Posting
• Route Optimization
• Trade Credits
• Buyer and Supplier Profile Validation
• Centralized Audits of Distributed Actions
About Instaknow

Instaknow is a fast-growing B2B Artificial Intelligence software company. Our “Human Intelligence Automation ®” AI software helps Fortune 1000 organizations and large government agencies become more efficient and productive by rapidly cutting time, effort and costs of data intensive manual operations. Our software has been granted five U.S. patents and more are pending.

Our current customers include global giants in banking, pharmaceuticals, logistics, legal, telecom, federal/state/city agencies and many more. Exciting new AI breakthroughs in our latest software release (think “dramatic advances beyond Robotic Process Automation”) are about to revolutionize how corporations rapidly achieve “Digital Transformation” at mass scale.

Our AI software is used in many industries and in hundreds of different ways, providing multiple avenues to succeed, a rich learning experience; and a chance to solve high-value business problems in never-before-possible ways.