CLAIMS

What is claimed is:

1. One or more non-transitory computer-readable storage media storing:

a document processor comprising sequences of stored program instructions organized as a main service and a plurality of model-hosting services, the model-hosting services implementing a plurality of different inference models and the stored program instructions of the main service being configured when executed by one or more computing instances of a virtual computing environment to cause the one or more computing instances to execute:

receiving a digitally stored electronic document;

invoking the plurality of model-hosting services to execute a plurality of interfaces automatically, including inferring at least a subject and a date in the electronic document, and based on the one or more interfaces, automatically inferring nonconformity with one or more of exception conditions based on one or more inference models, wherein the nonconformity with the one or more of exception conditions specifies at least one of an absence or existence of a signature;

a signature block matching a name of a requestor; and

a document execution date within a specific time range;

creating and storing a record of the electronic document in a system of record; and

marking the record, as needing and intervention, wherein the record of the electronic document was previously stored in the system of record;

a multi-channel communication controller comprising sequences of stored program instructions which when executed by the one or more computing instances of the virtual computing environment cause the computing instances to execute:

receiving the record of the electronic document, wherein the record is marked as needing the intervention;

receiving and digitally storing in a digital data store, a first task among a plurality of communication tasks, the first task comprising an outbound message directed from a first account to a second account, the first task being associated with a message template, one or more recipients, one or more communication channels, one or more events, and an information exception embedding specifying a state of the electronic document based on the record being marked as needing the intervention;

determining that at least a particular event among the one or more events has occurred, and in response thereto, executing the first task by retrieving the message template, forming one or more electronic messages for the one or more communication channels of the first task, populating the message template with message contents including calling a customer relationship management system (CRM) to retrieve one or more values corresponding to categorical message recipients of the message template and replacing the categorical message recipients of the message template with the values, and rendering the information exception embedding into the message contents by polling state data of the system of record and the document processor to retrieve one or more information exceptions;

automatically transmitting the one or more electronic messages on the one or more communication channels specified in the first task;each of the sequences of stored program instructions of the document processor and the multi-channel communication controller comprising sequences of browser-executed program instructions configured to interoperate with the virtual computing environment.

2. The non-transitory computer-readable storage media of claim 1, the document processor further comprising sequences of stored program instructions which when executed by one or more computing instances of the virtual computing environment cause the computing instances to execute one or more of:

using the digitally stored electronic document, automatically inferring one or more subjects and named entities specified in the electronic document and storing, in the record of the electronic document, references to one or more entities that are identified in the CRM system and that match the one or more subjects;

using the digitally stored electronic document, invoking the model-hosting services to automatically categorize the electronic document according to an ontology and to index the electronic document in the system of record;

using the digitally stored electronic document, automatically inferring a time range that the electronic document covers.

3. The non-transitory computer-readable storage media of claim 1, the document processor further comprising sequences of stored program instructions which when executed by one or more computing instances of the virtual computing environment cause the computing instances to execute:

receiving input representing an expert judgment;

storing the input in the record of the electronic document of the system of record;

appending the input to one or more training datasets that are associated with the inference models.

4. The non-transitory computer-readable storage media of claim 1, the multi-channel communication controller further comprising sequences of stored program instructions which when executed by one or more computing instances of the virtual computing environment cause the computing instances to execute the rendering the information exception embedding into the message contents by:

polling state data of the system of record and the document processor to retrieve the one or more information exceptions;

replacing a placeholder variable in the message with plain text, images and/or markup language text encoding a user interface detailing the one or more information exceptions in one or more formats corresponding to the one or more communication channels.

5. The non-transitory computer-readable storage media of claim 1, the multi-channel communication controller further comprising sequences of stored program instructions which when executed by one or more computing instances of the virtual computing environment cause the computing instances to execute the rendering the information exception embedding into the message contents by:

polling state data of the system of record and the document processor to retrieve the one or more information exceptions;

replacing a placeholder variable in the message with source code that is programmed to cause fetching the one or more information exceptions from the system of record and the document processor and to dynamically render a user interface detailing the one or more information exceptions in one or more formats corresponding to the one or more communication channels.

6. The non-transitory computer-readable storage media of claim 1, the multi-channel communication controller further comprising sequences of stored program instructions which when executed by one or more computing instances of the virtual computing environment cause the computing instances to execute:

receiving and digitally storing in the digital data store, a definition of a journey comprising an ordered workflow of the plurality of communication tasks comprising at least the first task linked to a second task, the second task comprising a second outbound message directed from the first account to the second account, the second task being associated with a second message template, one or more second recipients, one or more second communication channels, and one or more second events;

determining that at least a second particular event among the one or more second events has occurred, and in response thereto, retrieving the second message template, forming one or more second electronic messages for the one or more second communication channels of the second task, populating the second message template with second message contents including calling the customer relationship management system (CRM) to retrieve one or more second values corresponding to second categorical message recipients of the second message template and replacing the second categorical message recipients of the second message template with the second values;

automatically transmitting the one or more second electronic messages on the one or more second communication channels specified in the second task.

7. The non-transitory computer-readable storage media of claim 1, the document processor further comprising sequences of stored program instructions which when executed by one or more computing instances of the virtual computing environment cause the computing instances to execute automatically transforming one or more pages of the electronic document to enhance legibility.

8. A computer-implemented method of transaction processing with multi-channel communication and decision support comprising:

generating, by a decisioning party, one or more requests for information by a requesting party, via a document processing engine;

transmitting, by the document processing engine, the one or more requests for information by the requesting party, via a multi-channel communication system;

receiving, via the document processing engine, one or more documents and corresponding metadata transmitted by the requesting party, in response to the requests for information by the decisioning party;

automatically processing, via the document processing engine, one or more documents and corresponding metadata transmitted by the requesting party;

automatically validating, via the document processing engine, one or more documents and corresponding metadata transmitted by the requesting party;

triggering, via the multi-channel communication system, one or more of journeys comprised of one or more of tasks, wherein completion of a journey results in a communication by the multi-channel communication system , including executing a first task by retrieving a message template, forming a plurality of electronic messages for a plurality of communication channels from among email, SMS, and a web portal, populating the message template with message contents including calling a customer relationship management system (CRM) to retrieve one or more values corresponding to categorical message recipients of the message template and replacing the categorical message recipients of the message template with the values, and rendering an information exception embedding into the message contents by polling state data of the system of record and the document processing engine to retrieve the information exception, and automatically transmitting the plurality of electronic messages on the plurality of communication channels; and

storing, via a system of record, the one or more processed documents and corresponding metadata.

9. The method of claim 8, further comprising automatically identifying, via the document processing engine, subjects and named entities from one or more documents and corresponding metadata.

10. The method of claim 8, further comprising automatically matching, via the document processing engine, entities from one or more documents and corresponding metadata to back-end components.

11. The method of claim 8, further comprising automatically categorizing, via the document processing engine, one or more documents and corresponding metadata according to a canonical document ontology.

12. The method of claim 8, further comprising automatically transforming, via the document processing engine, one or more pages of the document to enhance legibility.

13. The method of claim 8, further comprising automatically identifying, via the

document processing engine, conformity and/or nonconformity with one or more exception conditions as defined in a document exception policy.

14. The method of claim 13, wherein the document exception policy further includes absence and/or existence of a signature; a signature block matching a name of the requesting party; and a document execution date within a specific time range.

15. The method of claim 13, further comprising, in response to nonconformity with exception conditions as defined in the document exception policy, automatically storing the document in a data store for further intervention.

16. The method of claim 8 wherein journeys further comprise tasks in a defined order and tasks are triggered by the completion of one or more subsequent tasks.

17. The method of claim 8, further comprising executing each of the tasks by:

retrieving one or more message templates from a content management system ("CMS");

populating content from one or more messages by replacing one or more message recipients with the values as found by a back-end component, identifying template variables within the text of one or more messages and replacing the text with current values from a data store and/or back-end component, and identifying a document exception embedding in the one or more messages for further rendering of the document exception embedding;

sending the rendered one or more messages such that the one or more messages appear to be sent by the decisioning party.

18. The method of claim 17, wherein tasks may further include an information exception embedding.

19. The method of claim 18, wherein the information exception embedding details the difference between the one or more documents requested by the decisioning party at a point of time, and the current state of the one or more documents.

20. The method of claim 18, wherein the information exception embedding further includes:

one or more documents the requesting party expects but has not received;

metadata the received one or more documents;

whether or not the one or more documents has been validated;

commentary from the requesting party regarding errors on the document; and

uniform resource locator ("URL") links to further information on the information exception embedding not directly visible in the embedding but can be accessed through the URL.

21. The method of claim 18, wherein the information exception embedding represents the embedding at a fixed point of time.

22. The method of claim 18, wherein the information exception embedding represents the embedding in real-time.