

lakyara vol.262

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obotics/AI an increasingly potent lever  
to boost operating efficiency

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10.May.2017

## Executive Summary



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### NOTE

1) For reference, see <http://fis.nri.co.jp/en/knowledge/nriblog/2017/01/20170105en.html>.

2) Such cost reduction reflects that personnel costs have risen sharply in India, a leading offshoring destination.

3) NRI has incorporated RPA into its BPO services for financial institutions. See <http://fis.nri.co.jp/en/news/2017/04/20170404en.html>.

4) RPA's definition and functionality differ somewhat among solution vendors.

*Financial institutions have recently been actively embracing robotics and AI to improve back-office efficiency. This trend is driven by both financial institutions' growing need to increase cost-efficiency and improvement in robotics/AI technologies' practical applicability.*

### Robotics/AI playing a growing role in improving operating efficiency

Many financial institutions have deployed robotics/AI in their front- and middle-office operations for applications such as robo-advisory services that analyze customer data/needs and internal compliance monitoring of unstructured data such as email and voice communications<sup>1)</sup>. Recently, however, Western and even Japanese financial institutions are actively embracing robotics/AI to improve back-office efficiency. A key reason that European and American financial institutions have done so is that improving offshore operations' accuracy while simultaneously reducing their costs<sup>2)</sup> is becoming an increasingly urgent priority amid regulatory pressure to upgrade back-office controls and monitoring. Japanese financial institutions are motivated by a need to reduce employees' overtime hours in anticipation of population shrinkage and to improve even routine operations' efficiency. Another contributing factor is growing availability of robotics/AI solutions that suitably meet financial institutions' efficiency improvement needs at a relatively low upfront cost.

Perhaps the most widely used robotics/AI solution in back-office settings is robotic process automation (RPA). Indian BPO (business process outsourcing) vendors that serve Western financial institutions are increasingly utilizing RPA in place of humans. Even in Japan, RPA is migrating from the empirical research phase to practical application at certain financial institutions<sup>3)</sup>. RPA is basically a software robot that can precisely replicate workflows in their entirety once they have been programmed to sequentially perform the workflows' constituent steps<sup>4)</sup>. RPA is ideally suited for work repeatedly executed in exactly the same manner on a more or less regular schedule. RPA's forte is simple, standardized repetitive tasks that are common in back-office operations, such as inputting transaction data to multiple systems at the end of every business day. This process typically entails modifying file formats to each system's specifications, logging into the systems with login credentials unique to each system and uploading the data.

RPA offers a number of advantages. First, it operates applications (e.g., Excel, data input systems) the same way a human would through the application's user interface, obviating the need to modify systems or databases when automating processes. RPA consequently enables financial institutions to upgrade their operating efficiency while continuing to use existing legacy systems. Second, RPA has much lower upfront costs and shorter implementation timelines than conventional automation projects involving system development. Third, robots, unlike humans, do not make simple operating errors. Such infallibility is aligned with Western financial institutions' aim of upgrading operational controls and monitoring functions. Fourth, monitoring tools offered by many RPA vendors in recent years enable centralized, real-time monitoring of robots' process controls and operating status.

### Robotics + AI = broader applicability

While highly useful, RPA has a few technical limitations. First, it is capable of only executing predefined workflows in a predetermined manner. If a workflow's inputs vary, RPA must be programmed with if-then logic that covers every variation. Such programming is reportedly often unfeasible in practice. Second, RPA is adept at transferring data between systems but cannot accommodate non-digitized or non-standardized data such as scanned documents, emails and textual information. Recently, however, solutions that compensate for such shortcomings have become available.

One such solution is AI-enabled data extraction using machine learning and/or language analysis. AI processes that extract only needed information from dispersed data sources such as documents, emails and websites are a potential substitute for manual information search/input processes<sup>5)</sup>. Such an AI solution might hypothetically be used to extract only information required by the HR department (e.g., employees' personal information, salaries, terms of employment, employment duration) from multipage employment contracts and to store the information in a readily accessible computerized format. Once converted into standardized data, the extracted information could be fed into downstream workflows by, for example, uploading it to another computer system using RPA or collating it against related information using some other application<sup>6)</sup>.

Many vendors of data extraction solutions specialize in specific types of documents (e.g., invoices, contracts, legal texts) subject to limitations on their format and/or informational content. Such limitations help the vendors

5) Such processes select relevant information through document pattern recognition and semantic analysis.

6) Additionally, the technology enables systematic storage of key information extracted from scanned image data and contracts that previously could be stored only in hardcopy format.

7) One factor behind such improvement in accuracy is advancement in OCR capabilities in recent years. OCR software can reportedly convert scanned documents, if in English, to machine-encoded text quite accurately.

amass requisite learning data and initial set-up knowhow, thereby facilitating implementation by customers and improving information extraction accuracy<sup>7)</sup>.

### **In-depth knowledge of processes to be automated is essential**

While robotics and AI now have substantial practical utility as described above, anyone planning to implement such technologies should be aware of two points. First, feasibility studies are essential when considering automating a business process. With data extraction solutions in particular, licensing costs and the difficulty of training AI algorithms increase in tandem with the amount of data targeted for extraction. The payoff from investments in data extraction solutions consequently varies on a case-by-case basis. Before investing in data extraction solutions, financial institutions need to scrutinize their existing business processes in terms of the necessity of the data being used, the purpose of such data's use and any duplication of data inputs across multiple organizational units. Second, business processes in which RPA or AI has been implemented are prone to become "black boxes." Financial institutions are well-advised to use the aforementioned RPA monitoring tools to develop a monitoring framework for robotically automated or AI-enabled business processes in parallel with the technology's implementation.

No longer merely research subjects, robotics and AI are becoming practical business tools from the standpoint of not only upfront costs but also accuracy. Correctly understanding their capabilities and limitations and learning to use them effectively will become increasingly important.

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