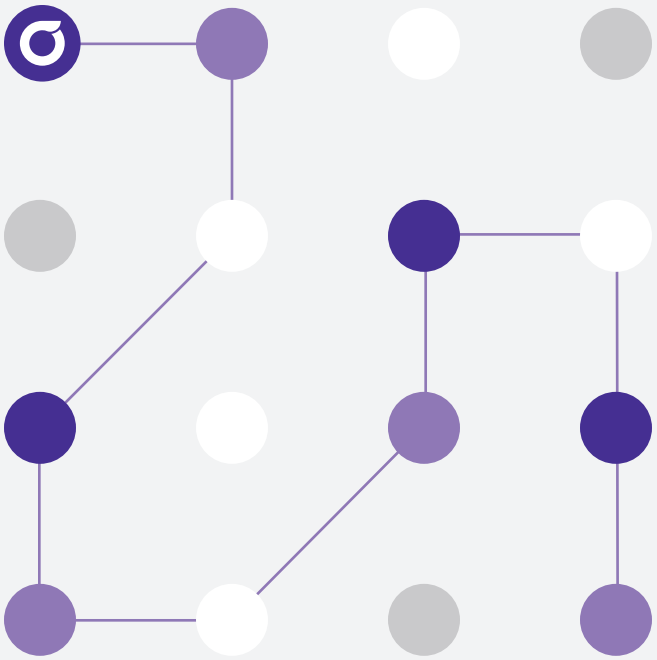
Olive

AI and Automation in Healthcare

Benefits, Challenges, and Impact of Advanced Technologies on the Healthcare Revenue Cycle



As leaders in healthcare operations and finance, you face an exceptionally unique set of challenges.

From overall process optimization to the details of employee benefits, every decision in a healthcare organization will in some way impact the overall revenue cycle. Thus, every cog and wheel involved, from clinical laboratories to healthcare consulting firms, must look at every new initiative with a critical eye and ensure they are taking steps forward to improve efficiency, reduce risk, increase productivity, cut costs, and maximize returns to provide a positive experience for patients and hospitals.

In the age of emerging AI and automation tools, every company in the healthcare industry--not just hospitals--play an important role in promoting industry-wide initiatives. From the founding of an AI company and every day from then on, industry support is essential for its success. The companies that support hospitals play a vital role with their buy-in and are essential to the success of hospitals, and Olive recognizes that. AI can not only provide long-term ROI for any healthcare-related business, from consults to laboratories, but can also influence staff, departments, and processes throughout the industry.

Understanding the Technology

When evaluating the potential benefits of an AI or automation solution, it's important for companies to have a working knowledge of the technologies the solution is comprised of. Most operational-focused solutions will include a combination of two or more of the following technologies:

- **ROBOTIC PROCESS AUTOMATION**
- **MACHINE LEARNING**
- **COMPUTER VISION**
- **VOICE RECOGNITION**

ROBOTIC PROCESS AUTOMATION

Robotic Process Automation (RPA) is the process by which a computer directly mimics actions that would otherwise be completed by a human[1]. The computer is trained with workflow logic and decision trees, so that it is prepared for variables within a workflow. Common tasks that can easily be automated with RPA include web-based workflows and basic interactions with native applications.

MACHINE LEARNING

Machine learning is the process through which an AI solution learns to act analogous to a human by being fed historical and ongoing data[2]. With machine learning, AI can get smarter over time without clearly expressed instructions from humans. The more data an AI is fed, the closer it can get to truly mimicking human actions.

> **Neural Networks** More advanced AI workflows will often require neural networks (neural nets), which is a specific type of machine learning, which allow the system to leverage historical data in order to learn how to make decisions like a human, based on probability. Training a neural net requires extensive repositories of past data, including examples of as many possible cases and outcomes as possible.[3]

COMPUTER VISION

Computer Vision (CV) is the process through which a computer identifies text from a non-digital (scanned, handwritten, etc.) document, and transcribes the information into any appropriate repositories. CV allows a computer to "see" a computer screen in the same way that a human would, and interact with it based on images and visual cues rather than text.[4]

VOICE RECOGNITION

Voice recognition systems are one of the most familiar forms of AI, voice recognition systems are able to listen for, comprehend, and respond to human speech. Voice recognition systems can either be
triggered by users or can use ambient listening to constantly monitor their environment for spoken triggers.

Evaluating the Benefits

Once a company has a good understanding of the technological components that make up AI systems, they can start evaluating the potential benefits of adopting AI solutions for their healthcare organization. In the case of operational AI, organizations will usually begin implementation with the workflows that do not require judgement and are repetitive, routine, and prone to human error, as these workflows have clear and near immediate functional and operational benefits with automation.

ERROR REDUCTION

For workflows that require significant amounts of data transfer that can easily be miskeyed by humans making honest mistakes, the most obvious benefit of AI is sheer error reduction. When judgement is not involved in a workflow, AI is able to nearly eliminate clerical errors, so long that it has been properly trained on all instances and edge case possibilities. When a task is performed the same way, every day, every time, it is an excellent candidate for improvement with AI.

INCREASED SPEED

In addition to completing tasks more accurately than human employees, AI also has an advantage when it comes to speed. Human employees have natural interruptions in daily workflows, from getting sidetracked by external cues to forgetting which steps in the process they have already completed. Combined with bathroom and lunch breaks, conversations with coworkers, and other normal interruptions, human employees can only accomplish so much in a standard 8-hour shift. AI, however, has the advantage of being able to work around the clock, or otherwise as frequently as your team needs. Additionally, AI only waits the length of the next step in a system (web page, native software launch, etc.) in order to complete the next task in a workflow, thus completing workflows in the most efficient manner possible.

STAFF REALLOCATION

AI provides huge potential for reducing or consolidating large administrative workforces, which can be taboo to discuss, but is necessary to acknowledge as a benefit. With increased speed and accuracy in completing workflows, human employees may only be needed to handle a few edge cases per day, depending on the workflow being automated. Thus, the employees currently tasked with completing the workflow currently will have increased bandwidth to have a larger impact on the organization. Those who are skilled in patient care, such as nurses or PAs, can be reallocated to patient-facing initiatives and advocacy positions. Those who are not skilled in patient care can be reallocated to other clerical positions that are either less prone to human error, require more of a human approach for success (such as a call center), or both.

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IMPROVED PROCESSES

Aside from the immediate benefits of integrating AI into daily tasks and allowing it to take over repetitive clerical processes, it can also provide recommendations for how to improve those processes either indirectly or directly. The manager of an AI's progress on its tasks can indirectly observe it and note where the AI encounters challenges or edge cases, and investigate why they occur. This can indicate potential places for process improvement and provide the manager with an opportunity to retrain the AI to be more efficient. Direct recommendations can come from cases of supervised and unsupervised machine learning as your AI learns how to interact with data and make decisions and takes actions accordingly. In these direct cases, your AI could identify and report on common roadblocks, and in advanced cases even provide suggestions for reconciling the process in the future.

IN-HOUSE INNOVATION

As an organization adopts AI across multiple divisions and departments, the IT team will be leveraged extensively throughout implementation, deployment, and evaluation. Getting your in-house technical staff familiar with the initial use cases for AI at your organization will enable them to identify other potential use cases, and will propel the speed at which your entire organization understands and adopts AI.

PARALLELIZATION

Organizations don't run with just one person on teams and in departments, and AI is no different. Efficiency can continually increase as more and more bots are utilized simultaneously to complete work. The benefit of parallel bots working on the same task can increase the completion rate while keeping error rates at all-time lows, and bots can also be run at the same time for different tasks that one employee completed before. When you have a bot per task, you can set new standards for the speed of completion, which can have even more long-term impacts on the ROI derived from implementing AI.

ERRATIC TASKS

No matter how many predictions are made, it's nearly impossible to estimate when random tasks can cause a spike in the amount of people you need on a schedule. With AI, at the click of a few buttons it's possible spin up or down as many bots as you do or don't need when these kinds of tasks pop up, making it infinitely easier to manage than worrying about hiring or firing staff to fit the demand of workflows. The only additional cost accrues when the bots are running, with no need to account for the cost of onboarding, training, or turnover.

Impact on the Bottom Line

Increased administrative and workflow efficiency have large impacts on overall productivity, but ultimately the impact that matters most to companies evaluating the cost versus ROI of implementing AI is the financial impact--the bottom line. It's simple to initially evaluate AI solutions based on the cost of implementing an AI solution and compare it to subsequent reductions in the cost of wages for human hours spent on a given task. In instances like this, the ROI of an AI solution may not be initially visible. ROI can become even harder to quantify when AI is used for non-operational tasks, like those that provide business insights.

When evaluating the ROI of an AI solution, revenue cycle teams must take an extremely critical eye to understand the full impact. Important considerations can be broken into 3 main categories:

TRAINING REQUIRED TO COMPLETE A WORKFLOW

CURRENT COST OF COMPLETING A WORKFLOW

LONGEVITY OF STAFF CURRENTLY COMPLETING A WORKFLOW

TRAINING REQUIRED

The first cost to analyze is the cost of training associated with a workflow. This should account for the hours spent by both the trainer and the trainee on learning the workflow, the cost of planning any ongoing or recurring trainings, and the cost of logistics and organizations resources required for a training. Additionally, it's important to consider the costs of training not only new employees, but veteran employees as processes change. Especially in the case of implementing new tools or EMR migrations, these can far exceed expected cost.

CURRENT COST

The second cost to analyze is the current cost of completing a workflow. This goes far beyond the hourly rate of employees currently completing the workflow, and should include every aspect that enables them to do so. Workflow per hour, error rate and the subsequent cost of each error, hardware cost per workstation, employee benefits and sick/vacation days, and overall workflow quality are all metrics that should be considered when evaluating the true current cost of completing a workflow.

LONGEVITY OF STAFF

Finally, the revenue cycle team should consider the longevity of staff in the role performing a workflow and the cost of turnover. Even when an employee is exceptionally skilled and efficient in their workflows, they will likely not remain in the same function at the same level of performance for their entire careers. Therefore, the overall cost of turnover in the departments performing workflows considered for automation should be evaluated and considered.

Training AI to automate repetitive, high-volume parts of the billing process, however, will require significantly fewer resources, and will scale with patient volume.

When to Adopt AI

As we enter into the golden age of AI, it is important now more than ever for healthcare companies to push the boundaries and find creative, unique ways to cut costs and increase cash flow. Introducing new technologies to a healthcare-related company can positively affect the company directly both functionally and financially, but it can also the quality of everything downstream, ultimately producing a better quality of healthcare for patients and hospitals.

When deciding how and when to implement AI, companies can evaluate the benefits of AI against upcoming initiatives and decide if AI can help them achieve these goals faster and cheaper over time. Determining the potential of AI successfully helping companies reach these goals can be determined by evaluating whether AI can solve a problem a company faces with sustainable results better than a human team can. During this evaluation, it's helpful to consider the initial cost of hiring a team of people, as well as the secondary costs associated with their training, turnover, and scalability. While training AI might have a higher cost initially, automating these repetitive, high-volume parts of a process will require significantly fewer resources over time, and can scale seamlessly with increased work volumes. Company goals that relate to improving efficiency or reducing errors are perfect examples of where AI can be a better option for long-term success.

Additionally, the cost of implementing a new tool versus implementing AI is another great place for companies to find more places to reduce cost. When companies look to implement new tools for their teams of people to reduce errors and improve efficiency, the cost of training time and beginner's mistakes have to be accounted for. At the start, a new software can seem like the safer option, and is happy medium for improvement without eliminating people, but adding in the additional training and error costs that are eliminated when AI is used tends to make it a better long term option financially.

Planning for the Future

Ultimately, the best option is for healthcare-related companies to consume all the information on AI they can get their hands on, and then pick the best option for adopting this transformative technology to their organization and its specific needs. As the industry watches healthcare companies succeed by taking advantage of AI and witnesses their financial and operational successes, the implications and possibilities become limitless.

The most important thing to consider isn't the short term gains of implementing AI, but the long term risk of not implementing AI. In order to overcome the razor-thin margins that many healthcare organizations face today, radical solutions like AI become a necessity. As AI becomes accessible for healthcare organizations of all specialties and sizes, it's only a matter of time until AI usage becomes ubiquitous in healthcare.

1. Lhuer, X., Willcocks, L. (2016, December). The next acronym you need to know about: RPA (robotic process automation). *McKinsey&Company.* Retrieved from https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/the-next-acronym-you-need-to-know-about-rpa

2. Marr, B. (2016, December). What is the difference between artificial intelligence and machine learning? *Forbes*. Retrieved from https://www.forbes.com/sites/bernardmarr/2016/12/06/what-is-the-difference-between-artificial-intelligence-and-machine-learning/2/#260ae3a0483d

3. Marr, B. (2016, December). What is the difference between artificial intelligence and machine learning? Retrieved from https://www.forbes.com/sites/bernardmarr/2016/12/06/what-is-the-difference-between-artificial-intelligence-and-machine-learning/2/#42c8a114483d

4. Coldewey, D. (2016, November). WTF is computer vision? *TechCrunch*. Retrieved from https://techcrunch.com/2016/11/13/wtf-is-computer-vision/