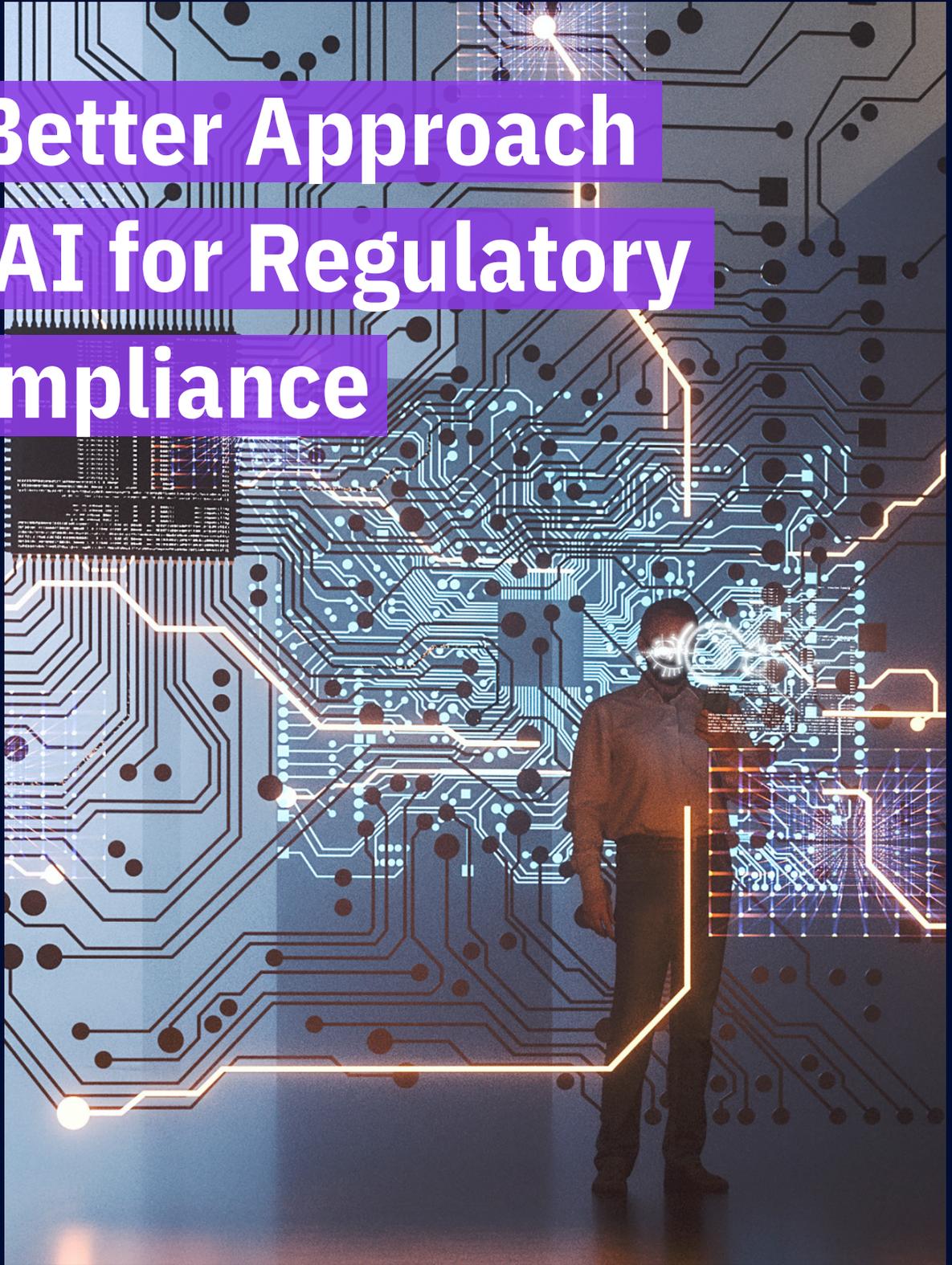




A Better Approach to AI for Regulatory Compliance

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A Better Approach to AI for Regulatory Compliance

Companies with regulatory compliance burdens are flocking to artificial intelligence (AI) for time-savings and cost reductions. The money involved is staggering: In 2021, Healthcare AI funding reached \$8.5 billion across 366 deals at an average of \$30 million each.¹

The reasons for these investments? AI can deliver the global healthcare systems and services up to \$906 billion of value annually,² and AI could deliver the global banking industry up to \$1 trillion

additional value annually.³ And PwC predicts that AI could contribute \$15.7 trillion⁴ to the global economy.

But these big numbers don't eliminate the fact that every month brings new articles and think-pieces about bursting the AI hype bubble. So, before you pay too much attention to those types of articles, let us tell you how our thoughts and experiences warrant a much better approach to AI for regulatory compliance.



AI for Compliance Requires More Than AI

BACKGROUND

InMoment acquired Lexalytics, the company that was first-to-market with a commercial sentiment analysis engine. Since then, we've been pushing the limits of natural language processing (NLP), machine learning (ML) and artificial intelligence

The truth is that “artificial intelligence” is just a tool. It doesn't really “do” anything on its own. What matters is how you combine AI with other technologies and the experts that know your business. In a field like regulatory compliance, for example, the challenges involved can vary wildly by industry and country. So, in order to address these problems, you need a combination of three technologies and human expertise:



The complex structure of regulatory and legal documents means that each of these technologies will fall short if it's not supported by the other two and many times with a helpful human eye. But most off-the-shelf analytics tools and vendors use only one or two of the three, leaving valuable data behind or overlooking critical context. InMoment, on the other hand, has developed all three tools into a comprehensive platform and has a team of highly trained experts. We build semi-custom applications that solve specific compliance challenges for our clients.

The rest of this paper will explain:

1. **Why Many “AI for Compliance” Solutions Fall Short**
2. **What You Need to Know to Build “AI for Compliance”**
3. **Three Real-world Examples of Effective AI for Compliance**

Why AI Often Falls Short in Regulatory Compliance

A key factor to the success of AI for compliance is having the right technologies in place to extract data from legal documents that are complex and hard to analyze

Every organization is subject to some regulation. Healthcare providers, pharmaceutical companies, and financial services firms face particularly heavy burdens. But despite massive investment and clear market opportunities, technology solutions for regulatory compliance are proving difficult to develop. Why?

In short: Because the complex structure of the documents involved means that traditional data analytics techniques aren't able to extract and understand all of the data that compliance professionals rely on.

Legal documents are full of both structured elements (such as tables and subheaders) and unstructured elements (free-standing text sections, descriptive lists, or commentary on information within tables). Two documents may share a format, such as a contract template. But the unstructured text sections are not standardized, and data may differ wildly even within the structured elements.

This distribution of data makes it very difficult to create a single piece of software that can automatically identify

and extract everything of value. Most existing systems use one or two of the three technologies: semi-structured data parsing, natural language processing, and machine learning and AI.

But the truth is that none of these can do the entire job on its own:

- A commercial semi-structured data parser won't understand the meaning of the text it extracts
- An open-source NLP engine won't understand how structured elements fit in
- An AI trained on regulatory documents can choke when presented with new content to analyze

To clarify this last point: AI relies on learning from examples. But regulatory compliance often deals with documents where the format changes but the information within remains consistent. In these cases, an AI system may stumble because the information it's asked to process looks very different from the data it was trained on.

The Key to Building an Effective AI for Regulatory Compliance

As we discussed earlier, large-scale AI systems that promise to replace humans are turning out to be unreliable or downright dangerous. The real opportunity here is to create technology solutions that help humans do their jobs better and faster by alleviating tedious, repetitive tasks.

To build an AI solution that actually helps humans with regulatory compliance tasks, you need to understand three points:

1. Regulatory compliance is very complex, but generally means confirming something: whether a particular document is compliant or

that your organization is properly tracking and adhering to shifting regulatory updates

2. Legal, medical, and financial documents have important information contained within both structured elements (tables and lists) and unstructured text
3. Traditional data analytics techniques fall short in regulatory compliance because identifying and extracting all of the data from a legal document requires more than AI





InMoment is one of a handful of companies who has both the technology stack and experience required here. Much like tailoring an off-the-rack suit, we use AI to customize our proven NLP platform to meet our clients' unique requirements. We don't believe in replacing humans or "solving" an entire industry. Instead, we help our clients do their work better and faster.



It's not AI or humans, it's AI for humans to help businesses work better and faster



We've built AI applications to:

- Help medical coding teams keep up with monthly Medicaid updates by extracting, structuring, and inserting diagnostic and procedure codes into an EHR
- Accelerate medical information offices by guiding support agents to the right answers
- Reduce non-compliance risk by ensuring that financial advisors make required disclosures and appropriate recommendations

These solutions are interesting as unique use cases. But they also serve as good general demonstrations of how to approach the use of data analytics and AI in regulatory compliance.

EXAMPLE 1

Helping Medical Coding Teams Keep Up With Medicaid Updates

Healthcare organizations employ teams of professional medical coders (Glassdoor average salary of \$37,000)⁵ to read monthly Medicaid updates and manually enter the new information into EHRs and other databases. These documents may be dozens of pages long and each state's Medicaid system distributes its own unique guidelines.

The task is monumental and human coders struggle to keep up. NBC News found medical claim error rates ranging from 7% to 75%.⁶ Medicaid has improved its 2010 error rate of 42%⁷ but they still lost \$31.6 billion to coding errors in 2018, and more than \$230 billion over a 6 year period.⁸ At one point, Medicaid sued UnitedHealth Group,⁹ alleging hundreds of millions of dollars in over-billing.

Fully-automated medical coding solutions face major hurdles and may never be viable. Instead, this is a perfect example of where technology can help humans, not replace them, by easing workloads and reducing error rates.

THE COMPLEXITIES OF MEDICAL CODING CAN CREATE HURDLES FOR AI SYSTEMS

The processes and documents involved in medical coding create big hurdles for any AI system. As demonstrated in Figure 1, relevant diagnostic and procedural codes and updates are contained within a mix of structured elements (tables) and unstructured elements (plain text).

Just like a human coder, any AI system must identify and extract all of this information and then relate each data point to the others (which treatment code goes with which diagnosis codes). In addition, any automated system must be able to identify footnotes and addendums that clarify special cases and exceptions, and then connect them to the related diagnostic or procedural codes.

2.2.25 TOTAL PARENTERAL NUTRITION (TPN) SOLUTIONS

2.2.25.1 Services, Benefits, and Limitations for Clients Birth through 20 Years of Age

In-home TPN for clients who are birth through 20 years of age may be considered through CCP. Eligible clients may receive short-term or long-term nutritional support when oral or enteral intake are unable to maintain adequate nutrition. Covered services must be medically necessary and prescribed by the physician.

Parenteral nutrition solutions, supplies and infusion pumps services may be reimbursed with the following procedure codes:

PROCEDURE CODES								
Solution Procedure Codes								
B4164	B4168	B4172	B4176	B4178	B4180	B4185	B4189	B4193
B4197	B4199	B4216	B5000	B5100	B5200			
Supply Procedure Codes								
B4220	B4222	B4224	B9999					
Infusion Pump Procedure Codes								
B9004	B9006	B4172						

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Fig. 1 | Example of medical coding document with procedure codes and treatment guidelines



EXAMPLE 1

HOW AI HELPS HEALTHCARE ORGANIZATIONS OVERCOME MEDICAL BILLING HURDLES

Rather than trying to train one giant AI model to solve all of these problems at once, InMoment selectively utilizes each of our core technologies to build a system that's more reliable and customizable.

We never tried to build an AI system to “solve” medical coding. Instead, we brought together the right technology and tools to help human medical coders

operate faster and more reliably, saving healthcare organizations time, money, and headaches. Stakeholders use our solution to keep up with monthly code changes from Medicaid, extracting data and relevant special cases, and then updating corresponding codes in their EHR systems.

We use our semi-structured data parser to identify and extract data from structured elements, natural language processing to analyze the unstructured text, and machine learning to understand

where special cases and exemptions relate to specific codes.

Our solution for “AI for medical coding” can:

- Extract procedural and diagnostic codes
- Relate them to the notes and addendums connected to each
- Insert this structured data into an Electronic Health Records system or other database

id	ACTION	CATEGORY NAME	CATEGORY CODES
CPT_HCPS_Policy-MediCal_212.pdf	CODE ADDITIONS	Anesthesia	00731, 00732, 00811, 00813, Code Range (00811, 00813)
CPT_HCPS_Policy-MediCal_212.pdf	CODE ADDITIONS	Audiology	L8625
CPT_HCPS_Policy-MediCal_212.pdf	CODE ADDITIONS	Chemotherapy	C9024, C9028, J9022, J9023, J9203
CPT_HCPS_Policy-MediCal_212.pdf	CODE ADDITIONS	DME	E0953, E0954
CPT_HCPS_Policy-MediCal_212.pdf	CODE ADDITIONS	Evaluation	G0515
CPT_HCPS_Policy-MediCal_212.pdf	CODE ADDITIONS	Injections	90756
CPT_HCPS_Policy-MediCal_212.pdf	CODE ADDITIONS	Medicine	J0604, J7345, 93793, 94617, 94618, 96573, 96574

Fig. 2 | Sample output of the Lexalytics Medicaid coding solution (created for this example)

EXAMPLE 2

Helping Medical Information Offices Answer Patient Questions Faster—Saving Thousands of People Hours

Medical Information Offices (MIO) are responsible for setting up a system to field and respond to patient questions about drugs, both during testing and after release. Given that people's lives may be at stake, it's imperative that every question be answered in a consistent and correct manner each time it's asked.

To ensure compliance, MIOs draw up detailed Frequently Asked Questions (FAQ) files. Patient questions are routed to a call center, sometimes outsourced, where agents reference the FAQ to answer each question. But the complexity of these FAQs means that each agent can take many minutes to answer a single question, even when the same question gets asked many times a day. In one of our data sets, 80% of drug-related medical information questions relate to just 20% of the FAQ.

Building an artificial intelligence to directly answer patient questions would be a herculean task, even without the threat of lawsuits when it got things wrong. Instead, AI can support medical information offices by helping human agents answer questions faster and more reliably.

Our semi-custom application is built on our platform and leverages AI trained with our Pharmaceutical Industry Pack. Our system can immediately understand what conditions, drugs, ailments, or issues a customer is calling about and deliver a correct response for the operator, all during the call.

For example, a patient might call in asking, "How much of this painkiller should I take? I'm a 180-pound guy."

Our system can tear this down to understand that the question relates to dosage of a painkiller for an adult male. Based on this analysis, we can immediately direct the human agent to the proper answer. (Note: this is a made-up example to illustrate how and where the system works.)

Our AI helps medical information offices save thousands of people-hours and dollars, all while reducing non-compliance risk. And while this system was developed for a call-center environment, it also shows great promise for use at all patient touchpoints, including emails, social media comments, chatbots, or even a physician's desk notes.

HOW AI HELPS:

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Reducing Risk of Disclosure Non-Compliance for Financial Services Firms

Financial services firms must demonstrate that their employees are working in their clients' best interests. This imperative can include a number of disclosure requirements:

- **Conflict of interest**
- **Commission structure**
- **Cost of credit**
- **Own-product recommendations**

Each disclosure, in turn, may contain a dozen or more sub-components. This adds up to a major burden for the service provider. On average, financial firms dedicate 10-15% of their workforce and spend a combined \$270 billion on regulatory compliance annually.

COMPLIANCE SPENDING IN FINANCIAL SERVICES

- **\$270 billion** industry spending on compliance
- **94% increase** in compliance costs
- **10-15% of workforce** dedicated to governance, risk management, and compliance
- **Average 10% of revenue** spent on compliance by 2022

THE COSTS OF NON-COMPLIANCE

- **45x increase** in regulatory fines and settlements from 2009-14
- **Up to \$19.1 million** lost revenue
- **\$1.1 million to \$20.4 million** business disruption
- **Average \$3.7 million** in productivity loss



EXAMPLE 3

To improve compliance, many firms build a library of template documents with all of the proper disclosures and legal language. Each advisor or broker then modifies the appropriate template on a client-by-client basis. But an average-size financial services firm may produce thousands of pages of client-facing documents every week. In the process, important disclosures may be accidentally modified or removed entirely.

Many firms rely on spot-checks and keyword searches to confirm compliance. But looking for individual

keywords may return hundreds of irrelevant matches littered through a document. On the other hand, searching for whole phrases may miss where a disclosure has been truncated or deleted.

The cost of failure is high. GlobalScape estimates that non-compliance can cost a firm up to \$39.22 million in lost revenue, business disruption, productivity loss and penalties. McKinsey found a 45x increase in regulatory fines and settlements over 5 years.



WITHOUT INMOMENT

- Spot-check a few documents
- Keyword and phrase search
- Slow and cumbersome
- High risk of non-compliance



InMoment

- Review all documents
- Clearly see what's inside
- Fast and efficient
- Reduced risk of non-compliance

Using AI to Improve Existing Processes

Rather than trying to build an end-to-end, failure-prone “AI for disclosure compliance,” InMoment focuses on improving existing processes. Our system empowers financial auditors to review all of their documents almost simultaneously, instead of spot-checking a handful. This substantially reduces non-compliance risk for financial services firms and banks.

We combine our semi-structured data parser with text analytics to quickly analyze long financial documents and extract all of the data, wherever it’s located: legal disclosures, asset allocation tables, statements of advice, client roles, and more. Then, our natural language processing algorithms parse the underlying structure and meaning of

the information. This enables us to make complex connections between data points wherever they appear in the document. Finally, we use artificial intelligence to structure this data and prepare it for further analysis. The nature of this analysis can vary based on your goals and existing technology stack. For example, we can export this data into an Excel spreadsheet. Or, as in Figure 3 below, we can just give you a simple text file.

In this example (mocked up for demonstration purposes), the output of our application shows at a glance whether proper disclosures were made, highlights own-product recommendations, and flags suspected cases of predatory lending techniques for further review.

BALANCED INVESTMENT OBJECTIVE:

- You wish to **adopt a limited portfolio** to protect you from inflation and tax
- You have a **limited understanding of the investment markets** and their operation
- When you make a financial decision, you are more focused on **minimizing possible losses**
- You can accept a **low level of volatility** in the value of your investments
- You are a **low risk taker** and prefer low levels of investment risk

RECOMMENDED STRATEGY (To address your stated needs, goals, and objectives, we recommend the following strategy to you):

Smith, you have informed us that you will receive an inheritance of approximately \$550,000. Due to this, your Age Pension will cease and therefore you need to replace the loss of pension income with a drawdown from the inheritance funds. Smith, we recommend you invest **all (\$550,000) of available funds** from your inheritance through our **High-Yield Self-Managed Tech Fund**. This allows you to maximize the return on your investment by **actively investing in self-selected** technology companies that are leaders in their fields.

Fig. 3 | Using InMoment to flag where a recommendation goes against the client's organization

Summary

Regulatory compliance is a complicated area that varies wildly from industry to industry and country to country.

The nature of the documents involved means that to build an “AI for regulatory compliance,” you need more than just AI. In fact, you need a combination of *semi-structured data parsing, natural language processing, and machine learning and AI.*

Despite massive investment, many “AI for compliance” tools fall short because

a useful regulatory compliance solution requires all three of these technologies, not just one or two and additional human expertise and intelligence.

InMoment combines the necessary technology stack with an experienced professional services staff to build semi-custom applications that solve specific regulatory compliance problems in healthcare, biotechnology, financial services, pharmaceuticals, and more.



1. https://www.cbinsights.com/reports/CB-Insights_Artificial-Intelligence-Report-Q3-2021.pdf
2. <https://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/the-executives-ai-playbook?page=industries/healthcare-systems-and-services/>
3. <https://www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/the-executives-ai-playbook?page=industries/banking/>
4. <https://www.pwc.com/gx/en/issues/data-and-analytics/publications/artificial-intelligence-study.html>
5. https://www.glassdoor.ca/Salaries/us-medical-coder-salary-SRCH_IL.0,2_IN1_KO3,16.htm?countryRedirect=true
6. <https://www.nbcnews.com/business/consumer/its-time-get-second-opinion-paying-medical-bill-n545626>
7. <https://www.gebauer.com/blog/medical-billing-and-coding-errors>
8. <http://medicareintegrity.org/error-rate-drops-but-medicare-still-lost-31-6-billion-to-preventable-billing-errors-in-fy2018/>
9. <https://www.nytimes.com/2017/05/19/business/dealbook/unitedhealth-sued-medicare-overbilling.html>

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About InMoment

Improving experiences is why InMoment exists. Our mission is to help our clients improve experiences at the intersection of value—where customer, employee, and business needs come together. The heart of what we do is connect our clients with what matters most through a unique combination of data, technology, and human expertise. With our hyper-modern technology platform, decades of domain authority, and global teams of experts, we uniquely deliver a focus on Experience Improvement™ (XI) to help our clients own the moments that matter. Take a moment and learn more at inmoment.com

