

**OREGON HEALTH & SCIENCE UNIVERSITY**  
**SCHOOL OF MEDICINE – GRADUATE STUDIES**  
**Considerations for Implementation of a Continuous Audit Program in Health Care  
Internal Audit**

How Data Analytics can Provide Further Value to Internal Audit Functions in Health  
Care

By

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CERTIFICATE OF APPROVAL

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This is to certify that the Master's Capstone Project of

Elsbeth G. Stevens

*“How Data Analytics can Provide Further Value to Internal Audit Functions in Health Care”*

Has been approved

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Capstone Advisor – Joanne Valerius

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## **Abstract**

Internal audit is a function that has been around for centuries. The purpose of internal auditing is to provide independent, objective assurance and consulting services designed to add value and improve the company's operations. It helps the company accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes.

The traditional manner in which this is done is by control testing of selected samples to ensure there are enough checks and balances to prevent or detect errors. With increasing use of technology, electronic transactions create an opportunity to tap into large data sets provide more rapid, detailed, accurate accounts of a story. In addition, efficiencies expand to workflow processes and limited staffing constraints.

Integration of data analytics and the internal audit function has the ability to enhance the value delivered to the organization. In rapidly changing times, health care is becoming of increasing interest for entities, competitors, and oversight agencies, as quality of services, costs and patient safety remain in the public's concern. The potential to implement a continuous audit tool and program can help to maximize process efficiencies, reduce waste, errors and fraud, and manage risks effectively. This paper explores considerations for selecting a tool, highlighting benefits and challenges of which to be aware, and developing a roadmap for successful implementation of continuous audit program utilizing data analytics in internal audit.

# Part I

## Introduction

### Introduction of the Research Objective, the Audit Team and the Environment

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This objective of this research initiative is to 1) determine if continuous auditing is a viable option for the specified audit department, 2) identify considerations to be included in the decision making process, 3) explore how to develop and implement a plan of action, and 4) provide information of software solutions that may remedy limitations in the current process.

The audit team is presently a two person department that consists of the Chief Audit Executive, the Director of Internal Audit, and the Staff Internal Auditor, who work for a health system in Oregon. The system is comprised of four hospitals – two critical access hospitals, a sole community hospital and a rural referral center and multiple ancillary services such as Family care, Women’s Health, Oncology, Rehabilitation Services and much more. There are over 3,400 employees, 350 active medical staff and approximately 200 visiting medical staff members.<sup>1</sup>

### What is Internal Audit

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Internal audit is a crucial function in many industries and whose beginning is linked closely to the international professional organization, The Institute of Internal Auditors

(IIA), established in the United States in 1941.<sup>2</sup> This organization is seen as the primary organizing body which promotes and develops guidance for the profession.<sup>2</sup> The demand for such a profession stems from the necessity to have some form of independent validation to minimize errors, waste, fraud and abuse.<sup>2</sup> The function of internal audit, as defined by the IIA, is;

...an independent, objective assurance and consulting activity designed to add value and improve an organization's operations. It helps an organization accomplish its objectives by bringing a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and governance processes.<sup>3</sup>

A core input of the internal audit is risk management, as stated by Broadleaf a consulting firm that specializes in risk management, is accomplished through activities to manage risk at an acceptable level, set by the organization, thereby using appropriate risk mitigation strategies.<sup>4</sup> The image in Figure 4 depicts enterprise risk roles and activities acceptable for internal audit. This enables internal audit to create audit work plans that ultimately provide value, insight and assurance regarding the entity's risk management effort and the effectiveness of its control structures.

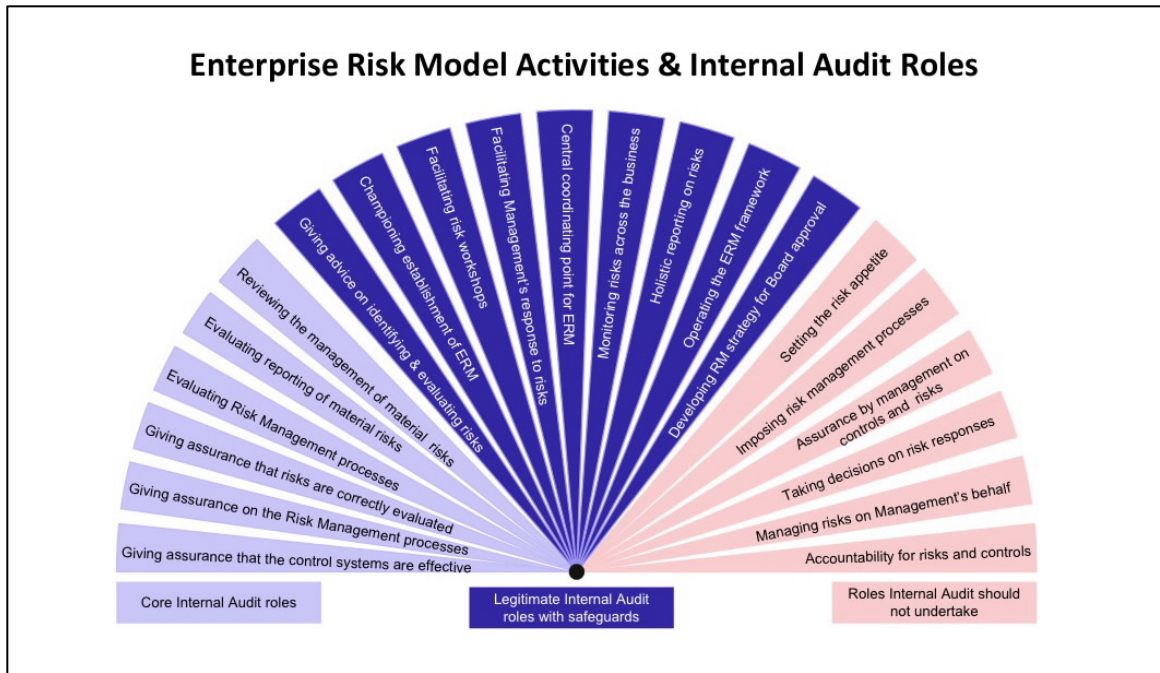


Figure 1: Appropriate reach of internal roles and responsibilities<sup>4</sup>

One way in which these roles are delineated is through the adoption of the three lines of defense. This is a risk management model and framework that helps define, assign and coordinate risk responsibilities within an enterprise.<sup>5</sup> Internal auditors are part of the third line of defense in an enterprise risk management framework (where process owners and standard setters make up the first and second lines), whose position is to provide assurance that the enterprise is meeting its objectives, see Figure 2.<sup>6</sup>



The Three Lines of Defense Model

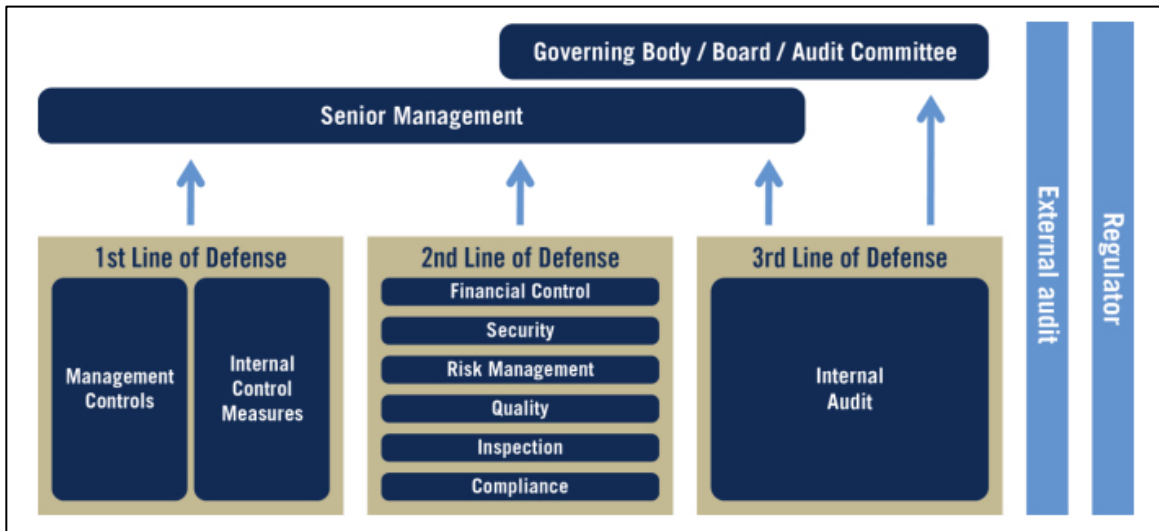


Figure 2: The model represents a depiction of responsibilities for effective risk management by three lines of defense

This includes risk management and optimization, performance effectiveness and cultural awareness and acceptance, see Table 1 for further detail.<sup>6</sup>

Scope of Internal Audit Independent Assurances		
Objectives	Elements of the Framework	Scope
The range of objectives is broad and includes: "...efficiency and effectiveness of operations; safeguarding of assets; reliability and integrity of reporting processes; and compliance with laws, regulations, policies, procedures, and contracts."	The risk management and control framework is made up of the following components: "...internal control environment; all elements of an organization's risk management framework (i.e., risk identification, risk assessment, and response); information and communication; and monitoring."	The scope of review processes is extensive and includes: "...The overall entity, divisions, subsidiaries, operating units, and functions — including business processes, such as sales, production, marketing, safety, customer functions, and operations — as well as supporting functions (e.g., revenue and expenditure accounting, human resources, purchasing, payroll, budgeting, infrastructure and asset management, inventory, and information technology)."

Table 1: As the third line of defense internal audit's scope takes into consideration objectives, framework elements and scope. Information in table adapted from IIA's discussion of the three lines of defense model.<sup>5</sup>

Early accounts of auditing have been identified in eras such the ancient Greek era of Mesopotamia, where the term *auditus* means "a hearing".<sup>7</sup> Traditional audit methods such as using a systematic process for checks and counterchecks in public financing and

accounting activities have also been noted in the Zhao dynasty in China, Babylonia, Greece, the Roman Empire and the City States of Italy.<sup>2</sup> Moving forward to the turn of the 20<sup>th</sup> century, the internal audit function was formalized in response to the need for collection of information, interpretation and communication with management on financial state, business developments, and operations as business activities grew in size, scope and complexity.<sup>2</sup> Examples of industries that have experienced and benefited from the internal audit function include railroad, defense, and retail. In the early 1990s the internal audit field began to see value in specialized focuses specific to the industry of the internal auditor.<sup>2</sup> Examples of these industries include “health care, oil, gas and energy, defense, financial services, transportation, wholesale and retail, technology, telecommunications, media and entertainment, government and nonprofits education, etc.”<sup>2</sup>

### **Background of Internal Audit and Health Care**

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An article by Charles Shaw, *Aspects of Audit*, published in 1980 demonstrates views of audit in the health care at the time. Perspectives of some eluded to the assurance of such medical reviews which could help in establishing clinical standards, yet others were in disagreement.<sup>8</sup> One issue was that the inference of audit implies a focus on accounting and fraud prevention and not quality assurance.<sup>8</sup> Figure 4 and Figure 3, excerpts of Shaw’s article, reflect generalizations about audit and health care at the time.

Then, a well-known model used in health care audits was structure, process and outcomes, derived from the manufacturing industry’s input, process and outcomes.<sup>8</sup>

Structure represents resources, process is resource application and outcome is the result of the intervention, although limitations were identified with this application of the model to health care.<sup>8</sup> Ultimately, the relationship between structure and outcome was seen as

### Types of Historical Medical Reviews

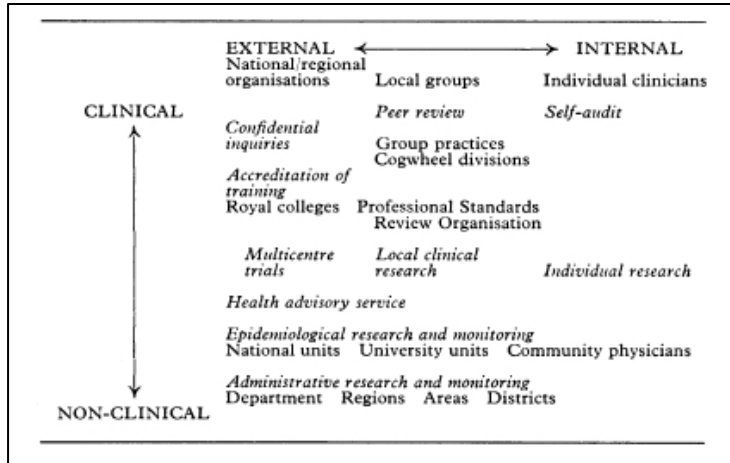


Figure 3: Review mechanism characteristics

difficult to define “and in many conditions the ideal outcome is controversial,” because of additional factors such as patient risk and social acceptability.<sup>8</sup>

Lastly, quality of care standards were viewed as

hard to define and there was a

reluctance to develop a framework, “So long as good medicine remains implicit, its evaluation by audit or any other method will remain haphazard.”<sup>8</sup>

Around a year after Shaw wrote this article, the first meeting of health care internal

### A Historical Health Service Review Methodology

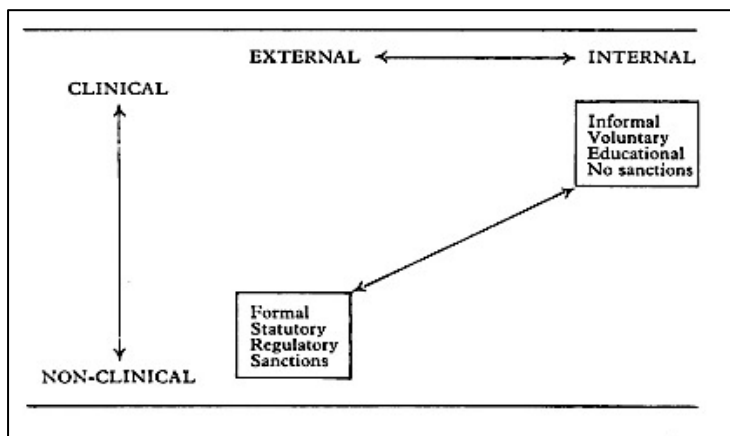


Figure 4: Model of historical methods of health service reviews<sup>8</sup>

auditors in the United States was held to discuss continuing professional education needs.<sup>9</sup> Three internal audit directors had connected previously in the year at an Ohio Hospital

Association annual convention and were interested in the needs and development of the internal audit profession, which effectively founded the Health care Internal Audit Group (HIAG), now known as the Association of Health care Internal Auditors (AHIA).<sup>9</sup> Since then, AHIA has dedicated its efforts to provide education, resources and networking for internal auditors in health care and formally endorses the IIA's International Professional Practice Framework (IPPF) and its mandatory components.<sup>9</sup>

### **Types of Data Analytics**

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There are four types of data analytics to describe the different performance complexities. These four types are descriptive, diagnostic, predictive and prescriptive analytics.<sup>10</sup> Descriptive analytics is the use of analytics to report on past event in effort to describe what has happened.<sup>10</sup> Diagnostic analytics is the drilling down to granular levels in efforts to discover why something has occurred.<sup>10</sup> This is especially helpful in better understanding trends or why specific incidents have arisen.<sup>10</sup> Predictive analytics is the extraction and application of data in assumptions and correlations to forecast future events, while prescriptive analytics builds on predictive analytics which linked to identified actions that will yield the best result.<sup>10</sup>

### **Definition of Continuous Auditing**

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The term continuous auditing refers to the ability to “perform automated audit testing across the enterprise on a regular, real-time basis and report findings directly to management electronically” for assurance purposes.<sup>11,12</sup> Continuous audit can refer to methodologies, processes and technologies. In this discussion will use it as it is defined within a technological perspective whose purpose is to collect data with the intention of

supporting auditing objectives.<sup>12</sup> The design and capabilities of technology have enabled the growth and maturity of tools available to internal auditors.

### **History of Continuous Auditing**

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Some models of continuous auditing have been demonstrated through the development of combining Groomer and Murthy work from 1989 and Vasarhelyi and Halper's work from 1991 to establish an architectural system where audit modules are embedded into a control and monitoring layer.<sup>13</sup> As defined by the American Institute of Certified Public Accountants (AICPA), "the embedded audit approach (EAM) involves the installation of files or code segments within the host system."<sup>14</sup> The Monitoring and Control Layer (MCL) is a computer assisted audit tool (CAAT) that was developed as an alternative to EAM and has "fewer concerns related to software maintenance, legality, client independence, and reliance on enterprise personnel."<sup>14</sup>

In addition, a more recent methodology, the audit data warehouse model, is an approach that may offer solutions to current limitations within the EAM and MCL techniques. Improvements include continuously transferring flat files from various organizational systems and sending automated alerts on a 24 hour basis, when anomalies or irregularities are discovered.<sup>14</sup>

### **Types of Continuous Auditing Solutions**

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There are various types of continuous auditing models, mainly customized solutions or packaged software solutions offered by vendors.<sup>12</sup> For the purposes of this discussion, the focus will be on packaged software solutions because customized solutions require

extensive efforts in both development and programming.<sup>12</sup> In a future section, generalized auditing solutions will be identified to assist in determining which product may best fit the needs of the audit function upon which this paper focuses.

Various researchers have developed and discussed a framework which provides sophistication and complexity levels through which continuous auditing applications transcend (listed from basic to more complex levels) :<sup>12</sup>

1. Continuous Data Audit: Focusing on verifying registrations as well as movement of data within and between systems and databases at the transaction level.
2. Continuous Control Monitoring: Using the technology to review specific system and process controls and control features, and to provide assurance that these are effective.
3. Continuous Risk Monitoring and Assessment: Using algorithms and probability models to assess judgments and risk evaluations as well as to monitor operation risks, environmental risks and rare, high impact risks.
4. Continuous Compliance Monitoring: Using information technology to create comprehensive taxonomies of regulatory compliance issues and progressively update regulatory changes as well as monitor organizational compliance with regulation.

An important point that Rikhardsson and Dull make regarding this framework is that it is based on how the industry has reported using continuous auditing software solutions and not on the actual capabilities of the software. More research focused on the software capabilities is needed to gain further perspective on added use.<sup>12</sup>

### **Looking Ahead – Analytics and Auditing**

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Health care entities are expanding the ways they use and integrate technology to their workflows. On the clinical side there are medical devices that transmit data to receiving applications, portions of patient data generated by EHRs made available through patient

portals, and in de-identified form, on data registries and quality reporting initiatives made available to the public. On the support services side, corresponding business data may be kept in house on multiple servers, or externally by business associates. In addition, software solutions are common for departments with limited personnel and financial resources who may be seeking vendor solutions such as software as a service (SaaS) tools. These and other services add to the complexity of the current business environment, increasing further risk because the entity is still ultimately responsible for managing its relationships and data. Some of these agreements may involve storage of enterprise data by business associates. Further considerations, other than data location storage, include the type of data involved in health care such as quality services, safety, compliance, information security, financial and production efficiencies, and overall management of the data to ensure successful business outcomes. The ability to combine the internal audit function with data analytics in health care has potential to provide insight of the fast changing environment, identify and mitigate risks, improve or validate controls and transform the way performance goals and strategies are managed for various areas where enterprise data may be stored.<sup>15</sup>

Enormous amounts of data are now being generated; a term commonly used to describe this phenomenon is *big data*. Internal audit departments have the ability to implement assurance and consulting services to applicable risks areas that are relevant to the organization through the access and utilization of big data.<sup>16</sup> *Data analytics* refers to the act of “inspecting, cleaning, transforming, and modeling data to highlight the useful information it contains” which can be used in to support decision making.<sup>16,17</sup> The ability to access big data at a more rapid pace enables better detail of the information. Each

internal audit department that is considering implementing a continuous audit program and increasing their data analytic activity must define their objectives. This step will aid them in evaluating the technologies that best fit their needs, including which systems/data sources must be utilized and how they will be incorporated in the development plan for implementation.<sup>16</sup>

## **Goals of Continuous Auditing**

### **Objectives of Continuous Audit**

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The goals of continuous auditing are to enhance an auditor's work through rapid, timely analysis of information to reduce risk or identify fraudulent activity. In considering the research on the implementation of continuous audit programs in health care internal audit departments, considerable program focus is on features that will enable the user to:<sup>17</sup>

1. Efficiently handle large sets of data
2. Have expanded availability to analytical functions and procedures
3. Incorporate programming to enhance data needs
4. Access logs of user actions
5. Ability to reuse analyses easily with minor changes

This occurs at various levels of data analysis but as the state of data analytics matures within the internal audit function through gained analytical skills and tools, the ability of internal audit to provide maximized value is seen. Below is Figure 5, which shows the



various maturity states of data analytics in the internal audit environment, adapted from KPMG.<sup>6</sup>

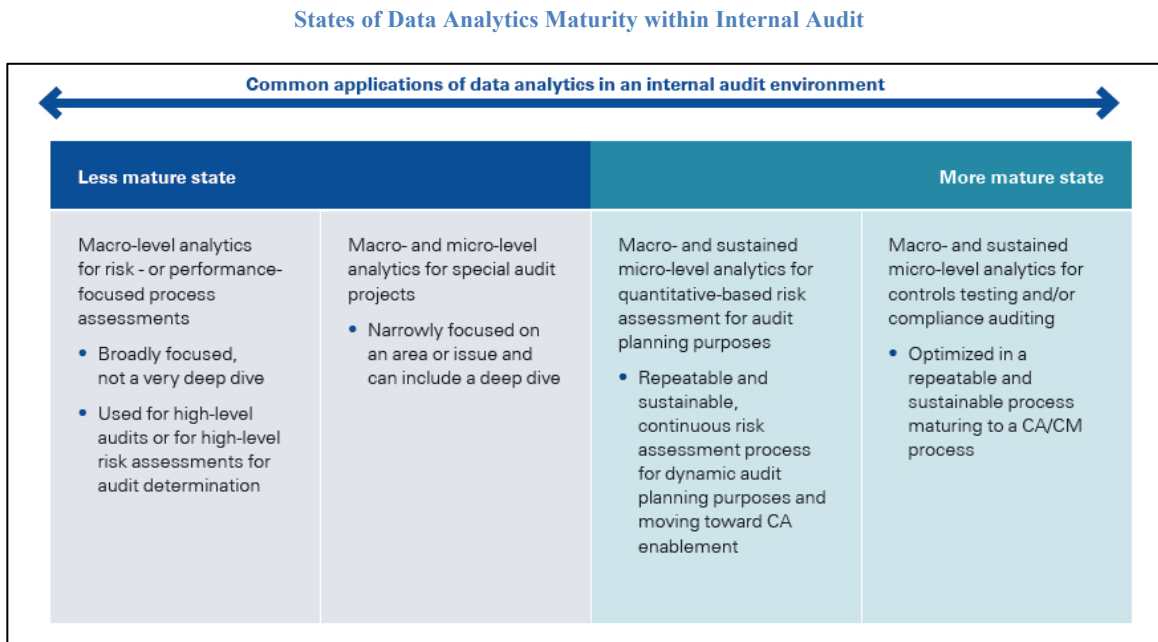


Figure 5 Maturity states in an internal audit environment<sup>6</sup>

With these objectives, the end goals are use of data for exploratory/profiling analysis, added or increased automation of routine work, and transforming data into information which more thoroughly describes the story.<sup>18</sup> These goals can be achieved through data visualization techniques, data mining, detection of anomalies, audit analytics, and use of ratios, metrics and other risk analytic measurements for predictive and prescriptive methods.<sup>10,13,18</sup> See Figure 6 to see how maturity states of internal audit are mapped against internal audit methodologies.

Mapping of IA Methodology against Data Analytic Levels of Maturity

Maturity Levels	Level I	Level II	Level III	Level IV	Level V
IA Methodology	Traditional Auditing	Ad Hoc Integrated Analytics	Continuous Risk Assessment & Continuous Auditing	Integrated Continuous Auditing & Continuous Monitoring	Continuous Assurance of Enterprise Risk Management
Strategic Analysis	○	○	◐	◐	●
Enterprise Risk Assessment	○	○	◐	◐	●
Internal Audit Plan Development	○	◐	◐	●	●
Execution and Reporting	◐	◐	●	●	●
Continuous Improvement	○	○	○	◐	●
Types of Data Analytics Applicable	Descriptive	Descriptive, Diagnostic	Descriptive, Diagnostic, Predictive	Descriptive, Diagnostic, Predictive, Prescriptive	Descriptive, Diagnostic, Predictive, Prescriptive

○ Data Analytics are generally not used      ◐ Data Analytics are partially used but are sub-optimized      ● Data Analytics are effectively and consistently used (optimized)

Figure 6: A depiction of how internal audit components can mature as levels of data analytics become more integrated in use, adapted from KPMG<sup>18</sup>

Potential examples of how the use of continuous auditing as an internal audit function can benefit crucial health care objectives are 1) developing scripts to audit for current employees against OIG regulations 2) comparisons of physicians against conflict of interest parameters and open payments (in accordance with the Physician Payments Sunshine Act) 3) automation of continuous testing against HIPAA Security controls in compliance with required risk assessments 4) monitoring for overpayments and 5) fraud, for example ensuring all employee(s) information is validated, reconciled and payments are appropriate.

## Considerations

### Benefits

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There are numerous benefits to implementing a continuous audit program in the internal audit function. First, as an article by Nelson describes, “CA technology enables auditors to perform automated audit testing across the enterprise on a regular, real time basis...”<sup>11</sup> Results can then be directly distributed in electronic format to corresponding department management.<sup>11</sup> Second, the ability to provide direct access to replications of the data, rules out the question of integrity of the data set. When an auditor does not have direct access to data, they must depend on other departments to provide data to them, which may leave room for incomplete data sets or misinterpretation of the data needed and collected. Third, time spent on cleaning and transforming data is minimized because automation of the process includes extraction, pairing and formatting.<sup>19</sup> Furthermore, continuous audit involves access to complete data populations which “can lead to superior results” and enhanced visibility into business transactions.<sup>13</sup>

Benefits of using generalized auditing software, database tools specifically designed with an auditor in mind, offer specialized features were data is in read-only format and cannot be modified. Additionally, audit logs offer traceability and repeatability of all commands, uses of programming scripts enable automated and/or repetitive audits, and powerful, multiple source connectivity access which includes text-based and flat files.<sup>17</sup> These features further enhance time efficiency through automation, mapping, data trending, alerts and compliance amongst regulatory requirements.<sup>6,17</sup>

## Challenges

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There are some challenges internal audit departments may encounter when implementing more mature types of data analytic practices while ensuring practices remain sustainable and goals achievable.<sup>6</sup>

**Planning & Design** -To begin, limited resources, such as personnel and financial budgets may affect time allocated to planning and design. In addition, a financial budget may limit software options available, requiring that priorities be set. To accomplish this, goals and objects should be well-defined and established.<sup>6</sup> Also, determining metrics and parameters to track and demonstrate progress is important for project focus and momentum.<sup>6</sup>

**Data Issues** – The ability to tap into disparate information systems is generally a benefit, but there may be challenges in ensuring consistent data formats, such as data types, fields, and arrangements that have been applied.<sup>6</sup> Furthermore incomplete data sets, inaccuracies and inconsistencies create questions of the integrity and quality of the data.<sup>6</sup>

**Education & Training** – An article by KPMG highlights a main challenge as the “inability to effectively leverage data analytics in order to effectively achieve audit objectives.”<sup>6</sup> A broader way to describe this limitation is lack of education or adequate user training to provide them with the knowledge to overcome these types of challenges. For example, developing standard data analytic definitions for internal/enterprise use, sample exceptions, false negatives and false positives, will improve consistency and concepts across the board. In addition, although challenging, developing auditors’ skill sets so that analytical concepts, and methodologies are put into practice ensuring interpretation of results are adequate will better position the internal audit function.<sup>6,18</sup>

Overall, adequate training and education can better inform the department on how to develop a continuous audit program framework, work flow and procedural guidelines.<sup>6</sup>

**Support** – A final challenge is collecting the buy-in and support from leadership and process owners whose areas may be affected.<sup>18</sup> Support from the board and executive leadership is essential as it helps to set expectations, budget and tone. It is important to communicate and work with operational units whose data may be incorporated into the continuous auditing program. If the program is set up where process owners or control performers are expected to participate in the process (e.g. results are pushed out for further review or follow up), then efforts during the design and planning plan should incorporate this and ensure there is support and mutual agreement of tasks and responsibilities.<sup>13</sup> Acquiring support from others in the enterprise will help to improve communications and interactions between departments.

**Additional Resources** – Other considerations include additional resources which will be needed for continuous audit implementation such as IT support internally and externally, Legal, and Supply Chain/Capital Purchasing process insight. Internal IT support will provide further information on technical and integration requirements, data storage, and security concerns. External IT support is typically part of the software solution installation package, but it will be important to confirm this. Use of request for information (ROI) provides details as to what requirements are necessary for data connectivity, location and access of software. The legal department should be involved during negotiations to review contract arrangements and ensure objectives are in alignment with the enterprise and necessary contract language is adequate. Finally, because purchase of a software solution is likely to be substantial enough to where it

requires routing to the Capital Purchasing process, it will be beneficial to have an understanding of document requirements and additional information to help facilitate the process.

## **Developing a Roadmap for the Data Analytics Vision**

*Data Analytics*, by W.W. Stippich and B.J. Preber outline three main areas critical to implementing a data analytics through continuous auditing, 1) ensure alignment with organizational objectives 2) balance short-term obligations with long term gains and 3) progress communication.<sup>10</sup>

### **Ensure Alignment with Organizational Objectives**

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A key component of successful data analytics in the internal audit function is understanding the enterprise's business strategy and goals and being in alignment with these elements.<sup>10</sup> Ways in which internal audit can achieve this alignment is by maintaining open lines of communication and collaboration with leadership to remain informed.<sup>10</sup> An example illustrated by Stippich and Preber is the enterprise risk assessment process which is designed to collect, review and analyze risks relevant to the enterprise, industry population and geographic location.<sup>10</sup>

### **Short-term Obligations and Long Term Gains: Finding a Balance**

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Although it is an initial investment on time, personnel resources and finances, making time to understand how continuous audit will benefit long term goals will justify the time it takes from short term obligations. For example, expanding the use of data analytics can

ultimately reduce testing preparation, field work, and provide more targeted audit scopes. Finally, data analytics through the use of continuous auditing continuously assesses key control performance, providing further insight on continuous risk data of the entity.<sup>10</sup>

### Progress communication

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Another aspect of using continuous auditing is that other departments may find value in the data collected from various data source(s). Communicating how internal audit can provide further insight to improve process efficiencies or compliance, for example, can strengthen collaboration and information sharing.<sup>10</sup> Improving lines of communication overall aids in active risk management and control.

### Establishing a Roadmap

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In keeping these three elements in mind, a roadmap for how to reach the desired state can be created. In a webinar by Zitting and Biland, Biland discusses five steps, see Figure 7, that she used to develop a detailed timeline for implementing data analytics in her internal audit department.

Implementation of Data Analytics in Internal Audit Roadmap

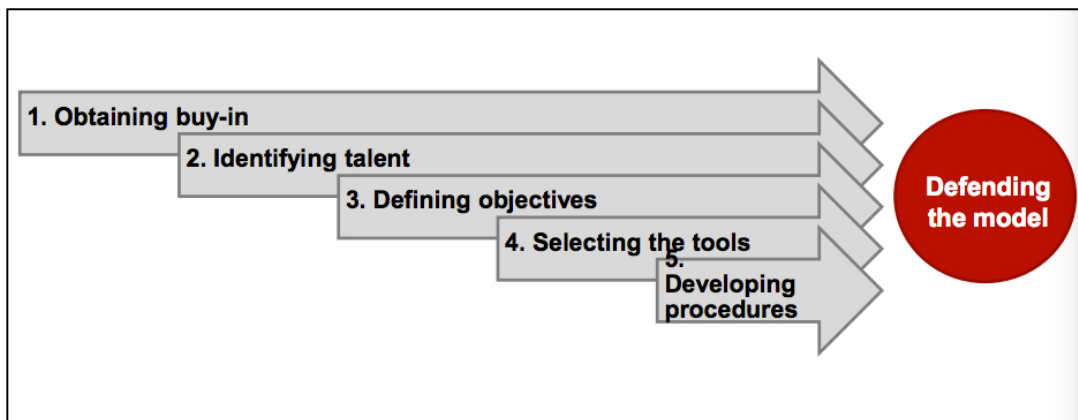


Figure 7: Five steps in developing a roadmap<sup>18</sup>

In the following section, the focus of this paper shifts to the development of a roadmap that addresses how the internal audit function can apply the considerations and recommendations in part I, into an actionable business plan.

## **Part II**

### **The Business Plan**

The roadmap steps, discussed in the previous section, Developing a Roadmap for the Data Analytics Vision, will be used as the framework for further exploration in this paper, see Figure 8, for this business design plan. These steps are;

- 1) Obtain Buy-in
- 2) Identify Talent
- 3) Define Objectives
- 4) Select Tools
- 5) Develop Procedures

Additional steps have been added to the plan, based on existing circumstances of the internal audit department for which the design has been developed for, which include;

- 6) Implement Tool
- 7) Enhance Policies and Procedures
- 8) Run, Maintain & Continually Mature Processes

This section provides further detail of how the internal audit department may choose to pursue the objective of implementing a continuous audit program.



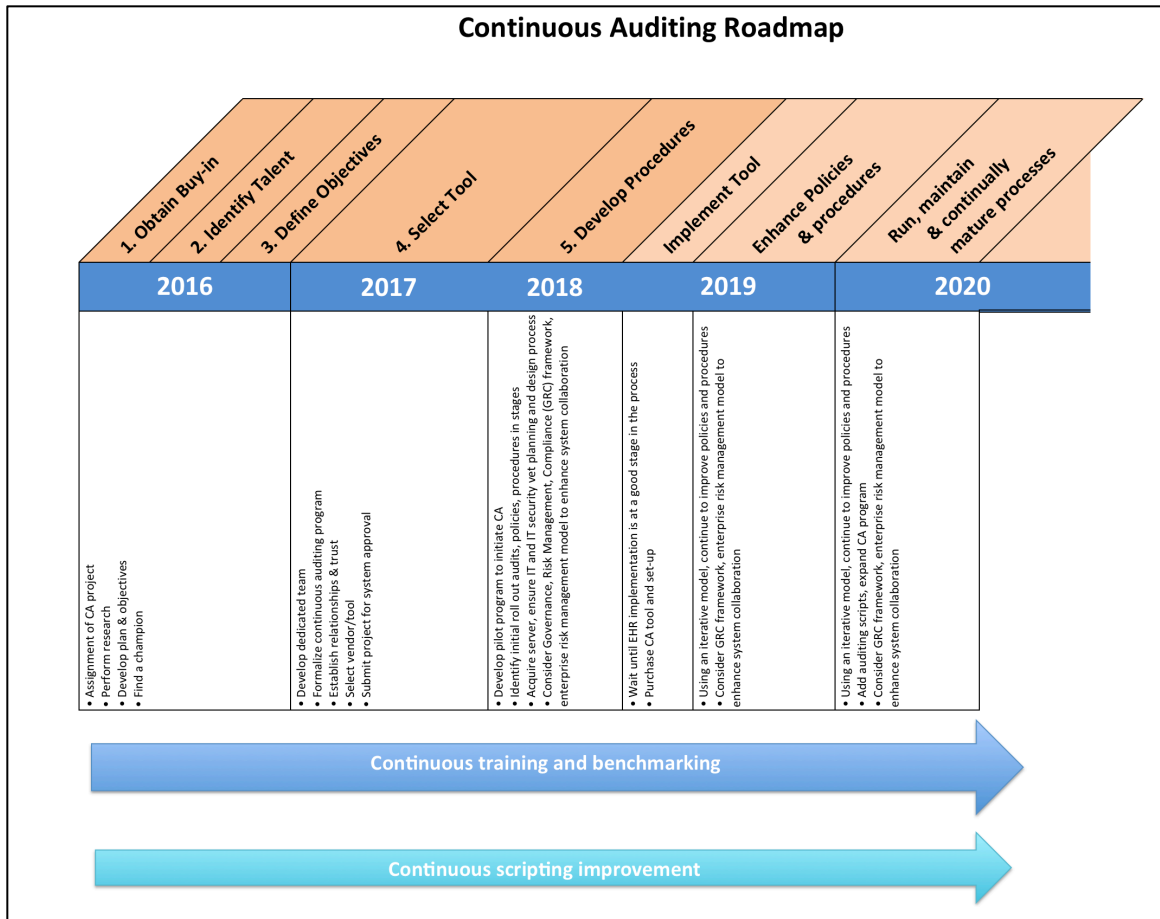


Figure 8: A drafted timeline for how the internal audit department will pursue implementation of a CA program

### Obtain Buy-in

There are several levels of buy-in that will need to be obtained for a program of this level and complexity. The first level of buy-in is with the Director of Internal Audit, or Chief Audit Executive, whose department will be responsible for the research, design and implementation of the program.

The next level will be to gain executive level and board level support from the audit committee, subgroup of the board of directors. They are charged with approving, internal audit function decisions. Lastly, once the project is approved, internal audit will begin gaining buy-in from management levels in department areas where automated testing will

be implemented. The plan currently is to present the CA plan to the audit committee later this year, 2016. Pending approval, internal audit will begin reaching out and working with relevant departments.

### **Identify Talent**

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The talent has been identified as the Staff Internal Auditor. This role has taken the responsibility of conducting research and developing a plan based on professional organizations, industry benchmarks and academic papers to support the business need. In addition, the Staff Internal Auditor is completing a degree in Biomedical Informatics, and has instructive experience in clinical system implementation, health care, data management and analytics along with professional audit knowledge. Furthermore, her interest is in data analytics and health care improvement processes.

### **Define Objectives**

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Broad objectives for this audit function is to further incorporate the use of data and technology, enhance cost effective solutions through quantification methods, ultimately improving the audit delivery model by improving efficiencies, value and providing an accurate reflection of the organization's current and future states. Inherently, the internal audit function would like to increase process transparency and decentralization of error correction, decrease audit times, and increase the capacity of entity risk management responsibilities acceptable for the internal audit function. Studies have also shown that utilization of capacity, efficient use of economic resources, and improved decision making are other benefits.<sup>12</sup>

## Tool Selection

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The internal audit department will discuss and create a request for proposal (RFP) document to send out to potential vendors. Review of templates from HIMSS, healthit.gov and other sites has been accomplished to create the template for the RFP. The decision to skip a request for information (RFI) is that the list of potential vendors has already been limited through review of industry use, and the department sees value in implementing a tool compatible among internal audit departments across many industries. The internal audit department will send RFPs to the list of potential vendors (see Table 2) with completed sections of the RFP such as entity information so that the vendors are able to produce an accurate cost quote. These sections include demographics, practice and IT information.

Potential Vendors for Review	
Software Solution	Notes
Audit Command Language (ACL)	Internal Audit has previous experience with ACL desktop product (retired)
IDEA	Other department(s) in the organization currently have a license and use this product
My SQL	Other department(s) in the organization currently have a license and use this product
Alteryx	
SAS	
SAP	
Oracle*	
<i>*Oracle offers various products. Further research to identify if any meet the needs of the organization is required</i>	

**Table 2: Potential continuous audit tool solutions for examination**

## **Develop Procedures**

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To ensure a successful continuous audit program, policies and procedures are required to set standards and guidelines. Elements to be outlined include;

- I. Audit Evidence storage
  1. Scripts
  2. Results
- II. Archival guidelines (duration)
- III. Long term storage and/or deletion methods
- IV. Supporting documents
  - a. Data dictionary
  - b. templates
- V. Workflow
  1. Internal – within the internal audit department
  2. Collaboration with other departments where follow up is required
- VI. Develop a continuous improvement process to maximize analysis and efficiencies

## **Further Steps to be taken: Tool Implementation, Process Improvements**

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Once the request for a continuous audit tool has been approved, and a vendor is selected Internal Audit will need to work with Supply Chain, IT, Legal and other stakeholders involved in the vendor management process. An important consideration that will affect implementation of this tool is the fact that the entity is currently working to transition

EHR systems to a new product and vendor. Because this is an enormous undertaking in itself, Internal Audit believes that implementation of a continuous audit tool should be pendant on the new EHR and the project has surpassed the go-live phase. This is not scheduled to occur until sometime in 2018.

A pilot project, outlining preliminary automated audits to be initiated, will be designed and followed. After each new automated audit has been deployed, Internal Audit will conduct a review which will include feedback from involved departments on where modifications and improvements can be made for overall effectiveness and efficiencies.

## **Conclusion**

This paper has explored the internal audit function in its traditional role and potential areas for maturity and growth. Like many internal audit functions, resource, personnel and time constraints may limit their ability to deliver value. Especially when processes remain less mature, utilizing manual methods for risk identification, control testing and work flow management. It is the goal of the identified internal audit department to mature in a meaningful way, incorporating further use of data analytics and utilize entity data which already exists to provide additional value.

Continuous auditing, the practice of using a software tool to execute automated control testing and audits, has many benefits to maximize internal audit value. Although much time is required in design, planning and education efforts, the trade off is invaluable. The ability to access big data generated by existing computer information systems and analyze it provides the entity with precise data to improve decision making. This is especially valuable for effectively identifying and managing risks that can impact the

entity's operations, especially in an industry such as health care where there is heightened interest and increasing regulations due to costs, quality and safety concerns.

The benefit of adopting a continuous audit tool and program will enhance the internal audit function and provide higher quality data to entity as a whole. It will provide further confidence in risk tolerance, acceptance and threshold levels to better target mitigation strategies. This paper outlines considerations to be taken in ensuring that the adoption and development of a continuous audit program is well designed, implemented and managed.

This information acts a guide to initiate the request of a continuous audit tool and program. Next steps, after project approval, include development of questions to be included to the RFI which are specific to continuous audit tools and the current IT platform(s), and developing a pilot program with identified initial automated audits, and data analytic and workflow procedures to support the audits and defining and publishing procedures for the continuous audit program.

## **Glossary of Key Terms**

International Professional Practices Framework (IPPF)	A conceptual framework developed by the IIA to organize authoritative guidance for the internal audit profession. This framework is used internationally.
Continuous Audit Analytics	The practice of using a software tool to execute real-time, scheduled, automated control testing and audits in determining if transactions are reasonable and appropriate.
Descriptive Analytics	The use of data collection, extraction, and examination to determine what has happened.
Diagnostic Analytics	The use of data collection, extraction, and examination to determine why event(s) have

Predictive Analytics	occurred. The use of data collection, extraction, and examination to forecast future events using assumptions and correlations.
Prescriptive Analytics	The use of predictive analytics combined with identified actions to determine the best decision (which will yield the most appropriate results).
Three Lines of Defense Model	A risk management model that describes delegation and assignment of roles and responsibilities to systematically approach risk.
Monitoring and Control Layer	A type of CAAT whose architecture provides continuous auditing capabilities. Professionals point out there are fewer concerns regarding software maintenance, legality, client dependence and reliance on enterprise personnel.
Computer Assisted Audit Tool	Designed to help automate and assign the auditor in the audit process, improving quality, speed and access.
Embedded Audit Approach	A block of code which is installed in host system(s) “processed such that only auditor-created master files are affected”.
Data Analytics	The act of “ inspecting, cleaning, transforming, and modeling data to highlight the useful information it contains” which can be used in to support decision making. <sup>16,17</sup>

## **Acronyms**

IIA	The Institute of Internal Auditors
IPPF	International Professional Practices Framework
AHIA	Association of Health care Auditors
HIAG	Health care Internal Audit Group, before it was renamed AHIA
AICPA	American Institute of Certified Public Accountants
MCL	Monitoring and Control Layer
CAAT	Computer Assisted Audit Tool
EAM	Embedded Audit Approach
CA	Continuous Audit
RFI	Request for Information
RFP	Request for Proposal



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