The University of Texas System Administration

Special Review of
Procurement Procedures Related to the
M.D. Anderson Cancer Center Oncology Expert Advisor Project

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November 2016

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December 2016

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January 2017

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January 2017

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SECTION 1

Report on Special Review by System Audit Office

November 2016
The University of Texas System Administration

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M.D. Anderson Cancer Center Oncology Expert Advisor Project

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THE UNIVERSITY OF TEXAS SYSTEM AUDIT OFFICE
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Executive Summary

At the request of the Chancellor, The University of Texas (UT) System Audit Office conducted a special review of the facts and process used by the M. D. Anderson Cancer Center (MD Anderson) for procuring services related to development of the Oncology Expert Advisor (OEA) clinical advising system. This review was requested after concerns were raised regarding the appropriateness of procurement activities. Concerns involved contracting and procurement practices, compliance with certain approval requirements, vendor delivery of contract requirements, and funding sources used.

The objective of the review is solely to identify and assess procurement actions related to development of the OEA system, and does not include review of project management or system development activities. In addition, results stated herein should not be interpreted as an opinion on the scientific basis or functional capabilities of the system in its current state. MD Anderson has engaged an external consulting firm to conduct a review of the system for that purpose.

By design, the OEA system would ingest data from a variety of sources and use IBM Watson artificial intelligence technology to offer care advice and match patients with clinical trials. The ultimate goal, as described by project leader Lynda Chin, M.D., former Chair of the MD Anderson Department of Genomic Medicine and current UT System Associate Vice Chancellor for Health Transformation and Chief Innovation Officer for Health Affairs, is to elevate the standard of cancer care world-wide.

Through August 31, 2016, approximately $62.1 million has been paid to external firms for planning, project management, and development of OEA. More than half of the funding used towards the system came from restricted gifts donated or pledged specifically for this purpose. This total reflects payments to external entities only; it does not include internal resources such as staff time, technology infrastructure, or administrative support. OEA has not been updated to integrate with MD Anderson’s new electronic medical records system, and is not in clinical use.

This Special Review included gaining an understanding of MD Anderson’s standard contracting and purchasing procedures and determining whether procurement activities followed those processes. MD Anderson’s standard procedures as described are sufficient to ensure procurements are handled appropriately and in compliance with institution and UT System policies and State procurement law, provided they are consistently applied. However, certain aspects of procurement and contract management for the OEA project were not handled in accordance with established policies and procedures.

- Of the six non-competitive procurements reviewed, with contract fees totaling $51.4 million, two were not formally justified and approved as exclusive non-competitive acquisitions. The total value of those two contracts is approximately $41.7 million.

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1 Oncology Expert Advisor and OEA are registered trademarks of The Board of Regents of The University of Texas System.
One contract amendment was not correctly executed, and one change order was not signed by an authorized party.

The OEA project was not approved through established Information Technology (IT) Governance and did not follow required IT Governance processes.

Work performed under an amended scope of work extended beyond the OEA project and intent of funding as approved by the Board of Regents of the UT System (Board).

Invoices were paid in full regardless of whether contracted services were delivered as agreed upon, and invoice review and approval to process payment to the vendor was not consistently documented as evidence that invoiced services and deliverables were both received and acceptable.

In addition, some actions were taken that are not specific violations of policy or standard procedures but could be perceived as inappropriate or lacking in transparency.

Only one of seven OEA-related service agreements reviewed ($18.75 million, or 27 percent of contract fees) was procured through a competitive process.

Procurement contracts and expenditures were not processed and reported in a consistent and transparent manner.

Fees were consistently set just below the amount that would have required Board approval.

Many vendor invoices were not paid timely.

Gift funds used in support of the OEA project have a deficit balance of $11.59 million as of August 31, 2016, meaning that MD Anderson spent gift monies it has not yet received from donors.
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Special Review of Procurement Procedures Related to the
M. D. Anderson Cancer Center Oncology Expert Advisor Project

At the request of the Chancellor, The University of Texas (UT) System Audit Office conducted a Special Review of the facts and process used by the M. D. Anderson Cancer Center (MD Anderson) for procuring services related to development of the Oncology Expert Advisor (OEA) artificial intelligence clinical advising system.¹ This review was requested after concerns were raised regarding the appropriateness of procurement activities. The specific concerns were related to:

- Contracting and procurement practices;
- Compliance with institution and UT System approval requirements;
- Vendor delivery of contract requirements; and
- Sources of funding.

To address these concerns, we reviewed procurement records, payment history, and other relevant documentation of actions related to OEA and associated projects. We also interviewed current and former MD Anderson and UT System Administration staff as needed to obtain an understanding of facts and activities pertinent to the OEA project and related procurements.²

The purpose of this Special Review is to provide information and observations related to these areas of concern, specific to procurement activities only. Objectives of this Special Review do not include review of project management or system development activities. In addition, results stated herein are based on documented procurement activities and recollections by staff, and should not be interpreted as an opinion on the scientific basis or functional capabilities of the system in its current state. MD Anderson has engaged an external consulting firm to conduct a review of the system for that purpose.

BACKGROUND

OEA is proposed to be a clinical advising system enabled by the IBM Watson artificial intelligence technology, to help community oncologists provide MD Anderson-quality cancer care to patients who cannot seek treatment directly from MD Anderson physicians. OEA, as envisioned, would continually ingest patient and research data, medical literature, and treatment options, to offer care advice. It would also be capable

¹ Oncology Expert Advisor and OEA are registered trademarks of The Board of Regents of The University of Texas System. Trademark applications were filed in November 2013 and May 2014 respectively, and registered in May and July 2015.
² Appendix E, Interviews and Resources.
of matching patients with clinical trial protocols to enable expansion of those trials and accelerate development of new treatments. The ultimate goal, as described by project leader Lynda Chin, M.D., former Chair of the MD Anderson Department of Genomic Medicine, is to “transform how medicine will be practiced, by leveraging artificial intelligence” to elevate the standard of cancer care world-wide. Dr. Chin joined the institution in September 2011 as chair of the newly created Department of Genomic Medicine. She is a member of the Institute of Medicine (IOM) of the National Academies, is a leading researcher in the International Cancer Genome Consortium (ICGC) and The Cancer Genome Atlas (TCGA) Research Network, and was recently selected to participate in IOM’s project on “Global Health and the Future of the United States” as a member of a committee that will “offer conclusions and recommendations to guide the next Administration, as well as other funders and global health actors in setting future priorities and mobilizing resources.”

Earlier in 2011, the IBM Watson (Watson) artificial intelligence system received global attention by winning a Jeopardy! exhibition against the game show’s two highest-rated players. Dr. Chin told us her idea was to use Watson technology to improve cancer treatment, and she approached IBM with her idea. The first MD Anderson contract related to development of OEA using Watson technology was signed with IBM in June 2012, specifically to develop a “pilot solution that will enable MD Anderson to analyze MD Anderson’s data to derive insights into patient outcomes.” The contract states that IBM had been working with health insurer WellPoint, Inc. since September 2011 “to develop and commercialize a Watson-based diagnosis and treatment decision support system for Oncology.” The contract also noted that one deliverable of the project would be to “help enable both MD Anderson and IBM to understand how data developed within this type of solution may be incorporated into the WellPoint Watson Oncology Solution.” The contract specified that version 1.0 of MD Anderson’s product would “focus on lower risk” myelodysplastic syndrome (MDS) leukemia patients. The original contract terms were for six months at a fixed fee of $2.4 million. That contract has been extended 12 times, with total fees of $39.2 million. The current extension expired on October 31, 2016.

Shortly after the contract with IBM was executed in June 2012, PricewaterhouseCoopers (PwC) was engaged by the institution to develop a “Business Plan for a Flagship Informatics Tool.” As described in the contract, the “Tool” would be able to “digest a broad range of whole exome, tissue, and other clinical data and translate them into both physician decision-support services and novel insights into both clinical care and future research.” PwC was specifically engaged to “lead an assessment of the capabilities necessary to build the [Watson-based] tool [and] incorporate the outcome of the assessment into a business plan that will guide development of a tool that meets MD Anderson’s intended use.” In describing the objectives of this engagement, Dr. Chin indicated that one purpose was to “develop a business plan and solution blueprint for OEA.” The initial contract was for a two month term at a fixed fee of $995,500, then extended an additional four months for a fixed fee of over $2.2 million. There were two subsequent

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6 Appendix B: Comparison of Scope of Work Deliverables for PricewaterhouseCoopers Contracts.
contracts with PwC related to development of OEA, with fees totaling approximately $21.2 million.7,8

The initial scope of OEA system development (MDS leukemia, as specified in both the IBM agreement and the July 2012 PwC agreement) was expanded in February 2013 to include five additional types of leukemia, then in December 2014 to include lung cancer. In January 2015, the PwC agreement in effect at the time was amended to include expansion of the database infrastructure beyond OEA, “to allow the ingestion of a wider variety and greater volume of clinical and research data for the Moon Shots Program and for clinical and research activities at MD Anderson” as part of the Big Data Initiative (BDI), later renamed Translational Research Accelerator (TRA) to distinguish it from other ‘big data’ initiatives.9 BDI/TRA was later removed from the agreement with Amendment 6 in October 2015, and contracted separately under a series of bridge agreements with PwC.10

Dr. Chin left the institution in April 2015 to lead the UT System Institute for Health Transformation. The OEA project is currently led by Joxel Garcia, M.D., Executive Director of the Cancer Control and Prevention Platform, who joined MD Anderson in August 2015. Andy Futreal, Ph.D., interim chair of the Department of Genomic Medicine, advises Dr. Garcia on OEA development, and Brett Smith, Executive Director of Platform Technology in Genomic Medicine, coordinates technical aspects of the system.

As of September 2016, the system is not in clinical use and has not been piloted outside of MD Anderson. IBM “[ended] support for the OEA Pilot System and for the OEA Demo System effective September 1, 2016.”11 The IBM agreement currently in effect states that the system “is not ready for human investigational or clinical use, and its use in the treatment of patients is prohibited” except as needed to test and evaluate the system.12 Internal pilots for Leukemia and Lung OEA were conducted using the prior medical records system (ClinicStation); OEA has not been updated to integrate with the current system (Epic). In addition, staff told us that drug protocol and clinical trial data in OEA is now outdated and must be updated before OEA can be piloted again within MD Anderson, before conducting pilot testing with a network partner.

The remainder of this report details observations pertaining to the procurement concerns communicated to us. In this context, the following OEA-related service agreements were reviewed during this engagement (Table 1) and are described further on pages 4 and 5:

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8 Agreement between MD Anderson and PwC, January 17, 2014, “Network Democratization of MD Anderson’s OEA Powered by IBM-Watson.”
10 Agreement between MD Anderson and PwC, “Network Democratization” Amendment 6, October 26, 2015.
11 Agreement between MD Anderson and IBM, Project Change Request 8.7, August 31, 2016.
12 Agreement between MD Anderson and IBM, Project Change Request 7, December 31, 2015.
TABLE 1

<table>
<thead>
<tr>
<th>Contract</th>
<th>Contract Amount Paid through 8/31/2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM Watson for Healthcare Evidence Evaluation &amp; Learning Svc.</td>
<td>$39,200,000 $39,185,560</td>
</tr>
<tr>
<td>PwC Business Plan for a Flagship Informatics Tool</td>
<td>2,222,700 2,223,703</td>
</tr>
<tr>
<td>PwC Oncology Expert Advisor Value Capture</td>
<td>2,480,000 2,480,000</td>
</tr>
<tr>
<td>PwC Network Democratization of OEA Powered by IBM-Watson</td>
<td>18,750,000 16,022,394</td>
</tr>
<tr>
<td>PwC Big Data Interchange Bridge Agreement</td>
<td>2,466,019 2,201,803</td>
</tr>
<tr>
<td>PwC Translational Research Accelerator Interim Bridge and PwC Translational Research Accelerator Bridge Agreement</td>
<td>4,999,046</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$70,117,765</strong> <strong>$62,113,460</strong></td>
</tr>
</tbody>
</table>

Although the first two agreements listed above do not reference OEA by name, product descriptions within the contracts are consistent with product descriptions and intended functionality as described in subsequent agreements. We consider both to be directly related to design and development of the tool eventually named OEA. Also, as stated earlier, BDI/TRA is not part of OEA. The last two agreements listed in Table 1 are included in this review because BDI/TRA development was added to an OEA contract then removed after some portion of work was performed and paid.

### CONTRACTING AND PROCUREMENT PRACTICES

**Observation 1:** Only one of the seven OEA-related services agreements was procured through a competitive process. Two of the six non-competitive, exclusive acquisition procurements were not formally justified and approved.

**Agreement with IBM (June 2012):**
Staff recalled a clear understanding that IBM would be engaged on the basis of the proprietary nature of Watson technology. However, an exclusive acquisition justification (EAJ) was not prepared in support of that decision.

**Agreement with PwC, “Business Plan for Flagship Informatics Tool” (July 2012):**
The first contract with PwC, to assess capabilities and develop a business plan for development of OEA, followed the established EAJ process and was approved by an appropriate authority. The justification cited PwC’s experience working with IBM on Watson technology within the health care industry, and listed IBM as the only other vendor considered. The stated reason for excluding IBM was that MD Anderson sought a consultant independent of IBM to develop the business plan.

**Agreement with PwC, “Oncology Expert Advisor Value Capture” (July 2013):**
The second contract with PwC, to provide program management for the agreement with IBM, assist in “enabling Watson uptake by Leukemia specialists with MD Anderson and throughout its
affiliates,” and propose a “Value Capture Model that focuses on improving and capturing value derived from implementing” OEA, also followed the formal EAJ process and was appropriately approved. No other vendors were considered, citing PwC’s knowledge of Watson technology and “in depth knowledge of MD Anderson clinical data quality and accessibility.”

Agreement with PwC, “Network Democratization of M.D. Anderson’s Oncology Expert Advisor Powered by IBM-Watson” (January 2014):
The third contract with PwC, to pilot use of OEA with up to two network partners (“democratize”) and integrate OEA into workflows for clinical adoption within MD Anderson, was competitively bid. Although competitive procurement procedures were followed, certain aspects of the relatively compressed award process could appear to lack transparency or not follow the spirit of competitive procurement. The request for proposals was published on November 22, 2013, with a close date of December 19. Regret letters were sent to all proposers except for PwC and IBM on January 3, 2014. Both PwC and IBM presented their proposals to the selection committee five days later, on January 8, and both vendors were notified that same day of the decision to award the contract to PwC. The contract with PwC was executed nine days later.

Three bridge agreements with PwC for further development of BDI/TRA were executed sequentially when BDI/TRA was specifically removed from the “Network Democratization” agreement by Amendment 6. None of the three were competitively procured. An EAJ was not prepared and approved for the first bridge agreement. The second bridge agreement, initially executed as an “interim bridge” then leading to the third bridge agreement, did follow the EAJ process and was approved by an appropriate authority. Project continuity was cited as the reason for engaging PwC without considering other vendors. Although BDI/TRA is not considered part of OEA development, this information is included herein because BDI/TRA was included by MD Anderson as part of an OEA agreement, with some portion of work completed and paid under the OEA agreement, before being split into the series of bridge agreements.

Observation 2: Two contract amendments were not correctly executed or signed by an authorized party.

Amendment 1 to the second PwC agreement (OEA Value Capture) was not formally executed by either party. Supply Chain Management staff requested that PwC sign and provide a copy after we brought this oversight to their attention.

In addition, a change order attached to PwC Amendment 4 of the Network Democratization agreement was signed by Dr. Chin, who was not authorized to sign contractual agreements on

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13 In this context, “network democratization” refers to making the OEA product accessible to partner members of the MD Anderson Cancer Network. Current MD Anderson partners include Baptist Health, Cooper University Health Care, Banner Health, Scripps Health, and Summit Medical Group.
behalf of MD Anderson. The change order was effective January 6, 2015, and included $1.285 million in additional fees. Amendment 4, under which the change order was executed, was signed by authorized signatory but not until more than four months later. Amendment 4 has an effective date of March 20 and was signed by MD Anderson on May 15, 2015.\(^{14}\) This was the only authorized signatory exception noted in our review of OEA-related agreements; Dr. Chin told us that it was “an unintentional procedural error.”

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**COMPLIANCE WITH APPROVAL REQUIREMENTS**

For research projects, typically a department chair approves projects within his or her department. In this case, Dr. Chin was the department chair. When asked who approved the project, Dr. Chin initially told us that she presented her idea to donors and they, through their pledges and donations, approved the project. She later clarified that she viewed the institution’s acceptance of a donor’s restricted gift as “represent[ing] the institution’s commitment to use the fund per donor intent – restricted to development of OEA.” Although she could not recall whether any specific individual at the institution formally approved the project, she did provide email evidence showing that she discussed her idea with the Provost, the Chief Medical Officer, and others prior to the institution engaging IBM and PwC to begin feasibility study and development efforts.

We were also told by another individual that Dr. Chin presented her idea to the MD Anderson Executive Committee, during which a concern was voiced that IBM was already working with Memorial Sloan Kettering Cancer Center (MSK) on what seemed to be a similar product. According to staff, Dr. Chin stated that MD Anderson could potentially be seen as “second” to MSK if the project did not move forward. We were told that President Ron DePinho, M.D., recused himself from the decision, left the room, and the Executive Committee agreed to move forward.\(^{15}\)

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**Observation 3: The OEA project was not approved through established IT Governance and did not follow required IT Governance processes.**

Dr. Chin described the OEA project to us as a donor-funded research and innovation project derived from a concept that artificial intelligence could potentially be applied to the delivery of health care. She clarified that, “because of its high-risk and transformative nature, it was not [an] idea suitable for extramural grant funding” and “therefore, it was up to philanthropy” to fund the project. As a donor-funded research project “not executed under IT management,” she did not consider it to be an information technology (IT) project that would have been subject to institutional IT development policies and processes.

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\(^{14}\) Although the handwritten date by the MD Anderson signatory reflects “5/15/14,” all other dates on the document are 2015. Thus, we assume the actual signature date was either May 15 or May 14, 2015.

\(^{15}\) Dr. Lynda Chin is the spouse of Dr. DePinho.
MD Anderson’s Information Technology Project Management and Governance Policy defines an IT project as, “an initiative that provides technology solutions (e.g., products, services, or results) characterized by well-defined parameters, specific objectives, common benefits, planned activities, a scheduled completion date, an established budget with a specified source of funding, and requires in excess of 80 hours of work effort to complete.”\textsuperscript{16} The formal IT governance structure includes an executive committee and steering committees for areas such as business applications, clinical care and operations, enterprise strategies, standards, technology infrastructure, and research and education. The executive committee (Information Systems Executive Team, or ISET) is responsible for approval of all “initiatives that provide technology solutions”\textsuperscript{16} to ensure “consistent execution of [information systems] strategies which are aligned and driven by business strategies” and a “transparent decision making process on IT investment […]”\textsuperscript{17} The OEA project was not proposed to ISET, did not receive formal ISET approval, and did not follow the established IS Governance Project Portfolio Management process.

We believe OEA meets the definition of an IT project per MD Anderson policy primarily because the objective of the project, from its inception, was to develop a technology solution to be broadly used in delivering MD Anderson services. The initial contract with IBM defined as its objective to “deliver an initial pilot of an IBM Watson for Healthcare Evidence Evaluation and Learning Service Solution,”\textsuperscript{4} and the purpose of the first PwC contract was to perform a technology assessment and develop a “business plan that [would] guide the development of the Tool.”\textsuperscript{5} Regarding philanthropy as the funding source, the first $17.6 million spent on the project ($15.4 million paid to IBM and $2.2 million to PwC) came from institutional IT funds rather than gift funds.

We acknowledge that MD Anderson’s policy definition of an IT project could be subjective. Although we believe OEA meets the definition, Dr. Chin told us that she views OEA only as a “research innovation project” and, as such, IT project procedures should not apply. We view the project as both. She further stated that ISET leadership “should have suggested or required such action from [her]” if ISET approval and governance was needed. IT staff reported to us involvement throughout the project, but confirmed that the IT governance process was not followed. Staff told us that Supply Chain Management would normally confirm ISET approval before processing purchase orders. However, in this case procurement staff stated that this project was an “outlier” and did not provide further explanation or justification.

**Observation 4: Procurement contracts and expenditures were not processed and reported in a consistent and transparent manner.**

Throughout this review, obtaining all relevant contracts and amendments was challenging. Supply Chain Management did not have knowledge or possession of some of the contracts and amendments that had been handled entirely by Legal Services even though the corresponding purchase orders had been issued. There are no clear or consistent criteria in place to define circumstances under which this would be allowable or appropriate.

\textsuperscript{16} Appendix D: MD Anderson Information Technology Project Management and Governance Policy.
\textsuperscript{17} http://inside.mdanderson.org/isgov/is-governance/
Another factor leading to difficulties in obtaining all relevant agreements for this review is that there were multiple contracts with PwC we consider to be directly applicable to OEA, but only the third agreement (Network Democratization) was provided by staff when agreements were first requested. However, because the System Audit Office conducted a procurement review in 2013, we were aware that there were three separate agreements with PwC directly applicable to planning, ongoing project management, and development of the OEA system envisioned by Dr. Chin. We compared each scope of work and noted some deliverables that are very similar, as described in Appendix B. In addition, the first two of the three agreements were priced just under MD Anderson’s threshold for approval by the UT System Board of Regents (Board) (see Observation 6 on page 10). Although it is possible that project leadership did not initially foresee engaging PwC throughout the entirety of the OEA project, we believe that descriptions in the scopes of work imply that PwC viewed each agreement as a continuation of a single project. In addition, viewing each agreement separately does not clearly reveal the full engagement of and fees paid to PwC for their involvement in the OEA project.

We also noted that significant changes were made to the scopes of work for the second and third PwC agreements. For the second agreement (OEA Value Capture), pilot assessment of democratization of OEA within MD Anderson was included in the original agreed-upon scope of work but removed with the first amendment to the agreement.\(^{18}\) Pilot testing and democratization became primary objectives of the third agreement (Network Democratization). The scope of work outlined in the Network Democratization agreement also changed significantly with its third amendment, to add development of BDI/TRA, then those changes were later removed from the agreement after some portion of that work had been performed and invoices paid.\(^{19}\)

**Observation 5: Some contract amendments extended the scope of work beyond the OEA project and intent of funding as approved by the Board of Regents.**

Three weeks after the initial agreement for Network Democratization was executed with PwC in January 2014, expenditure of up to $15 million from restricted gift funds was approved by the Board, specifically to engage an outside firm to assist in “getting M. D. Anderson oncology expertise into community practice (i.e., network democratization) using a cognitive clinical decision support system such as OEA.”\(^{20}\) Board minutes also state that the outside firm’s “transformation team” would “assist in integrating and testing the tool into [the] delivery systems” of “other health care providers in the M. D. Anderson Cancer network.” The original scope of work specified that a pilot of OEA would be conducted with up to two network partners. Of the $16,022,394 paid under the Network Democratization agreement (Table 2),

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\(^{18}\) Original scope of work: “Pilot adoption of Oncology Expert Advisory with MD Anderson network (i.e., democratization.” Revised scope of work: “Removed. This is no longer a required deliverable.”

\(^{19}\) Although that work was paid out of separate funds, the BDI/TRA work was performed under the PwC Network Democratization agreement.

\(^{20}\) *The Minutes of the Board of Regents of The University of Texas System*, Meeting No. 1,116, February 5-6, 2014.
approximately $4.4 million was not directly related to democratization of OEA as approved by the Board.\(^{21}\)

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<tr>
<th>Fees and Expenses Paid to PwC</th>
<th>Under Network Democratization Contract</th>
<th>As of 8/31/2016</th>
</tr>
</thead>
<tbody>
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<td></td>
<td><strong>Fees</strong></td>
<td><strong>Expenses</strong></td>
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<tr>
<td>OEA</td>
<td>$10,166,554</td>
<td>$1,456,506</td>
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<tr>
<td>BDI/TRA(^1)</td>
<td>1,400,000</td>
<td>125,523</td>
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<tr>
<td>NLP(^1)</td>
<td>2,106,555</td>
<td>182,256</td>
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<tr>
<td>Other(^2)</td>
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<td><strong>Total</strong></td>
<td><strong>$14,258,109</strong></td>
<td><strong>$1,764,285</strong></td>
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\(^1\)Added by Amendment 3, removed by Amendment 6.

\(^2\)Includes integration with AT&T Care application for use of MD Anderson patient directory and associated project coordination and support, and production of Moon Shots Anniversary video (Amendment 4).

**TABLE 2**

In February 2015, Amendment 3 added development of the BDI/TRA data interchange and natural language processing (NLP) annotators to feed that data interchange to the Network Democratization agreement’s scope of work, at an additional fee of $1.568 million.\(^{22}\) Subsequently, Amendment 4 expanded data interchange requirements and added fees for development of a promotional video that occurred several months earlier.\(^{23}\) All staff we spoke with acknowledged that BDI/TRA is a separate project, not part of OEA, even though BDI/TRA development was added to the OEA Network Democratization agreement with PwC. NLP is indirectly related to both projects in that it assists in translating data to feed into BDI/TRA, and BDI/TRA could potentially house a subset of data that is used by OEA. However, both BDI/TRA and NLP annotators are intended for much wider use beyond just OEA. The scope of work specified in Amendment 3 was removed from the contract by Amendment 6, with a separate bridge agreement executed for the BDI/TRA development. In effect, any work performed and funds spent on BDI/TRA and NLP development using the Network Democratization agreement were beyond the intent of funding for the PwC contract as approved by the Board.

\(^{21}\)PwC invoices generally did not itemize fees per deliverable, and fees on resource hours were only itemized for the first PwC agreement (Business Plan). For the Network Democratization agreement, the breakdown of fees and expenses by project is based on the purchase order under which each invoice was paid.

\(^{22}\)Natural language processing annotators analyze unstructured data, such as comment or free text fields, to capture information and convert that information into a structured format.

\(^{23}\)The promotional video was produced for the October 2014 Moon Shots Anniversary.
Observation 6: Fees were consistently set just below Board approval thresholds.

While negotiation of fees as low as possible is desired, we observed a consistent pattern of PwC fees set just below MD Anderson’s Board approval threshold as shown in Table 3, with most invoices listing a lump sum amount for a broad list of deliverables.

<table>
<thead>
<tr>
<th>Contract</th>
<th>Amount</th>
<th>Fees Paid</th>
<th>Expenses Paid</th>
<th>Total Paid</th>
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<td>Business Plan</td>
<td>$2,222,700</td>
<td>$2,111,485</td>
<td>$111,218</td>
<td>$2,222,703</td>
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<tr>
<td>BDI/TRA Bridge 1</td>
<td>2,466,019</td>
<td>2,201,803</td>
<td>$0 thru 8/31/16</td>
<td>2,201,803</td>
</tr>
<tr>
<td>BDI/TRA Bridge 2</td>
<td>4,999,046</td>
<td>No payments as of 8/31/16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: The Board approval threshold for MD Anderson was increased from $2.5 million to $5 million in November 2015, shortly after BDI/TRA Bridge 1 was executed. The term for both of the bridge agreements was six months.

TABLE 3

Dr. Chin told us she did not recall how fees were determined and was not involved in contract negotiations. Another individual we spoke with recalled that, in a meeting to discuss the second BDI/TRA bridge agreement (after Dr. Chin’s departure), discussion centered around how much work could be done under the new approval threshold of $5 million rather than discussion of actual work remaining and appropriate or reasonable fees for that work.

VENDOR DELIVERY OF CONTRACT REQUIREMENTS

Except for early project work paid out of institutional IT funds and after her departure in April 2015, Dr. Chin was responsible for review and approval of invoices to validate that work was performed as billed. Dr. Chin continued to review and approve OEA invoices as recently as November 2015 for work performed during her tenure at MD Anderson (see Observation 9 on page 13). Since that time, Mr. Smith has reviewed and approved invoices for payment, and we were told that responsibility for BDI/TRA invoices was recently transitioned to Michael Antonoff, Executive Director for Enterprise Business Services, Institutional Analytics and Informatics, and Big Data.

24 Invoices paid out of institutional IT funds to IBM, or to PwC for the first agreement, were typically reviewed and approved by the former Chief Information Officer ad interim, during routine one-on-one meetings or via email with IT department administrative staff.
Observation 7: Invoices were paid in full regardless of whether contracted services were delivered as agreed upon.

Even though the contract with PwC to pilot network democratization has expired and all invoices have been paid, OEA was not piloted “with one or two partners” as specified in the contract’s scope of work. Dr. Chin cited several factors she believes prevented piloting with external partners during the term of the contract, including time needed for compliance and information security reviews of the cloud-based data repository to be used for network democratization, and lack of engagement or interest by network partners. She further stated that her approval was of services and deliverables as cited on the invoices rather than progress against contract timelines or requirements.

The OEA Network Democratization agreement states the original intent was to pilot the decision support system for leukemia. Staff told us that the plan to pilot Leukemia OEA internally was suspended mid-project, with lung cancer chosen instead because project leaders thought that area would provide greater opportunity for a timely completion. Medical oncology staff also told us that internal pilot testing of Lung OEA achieved an accuracy of prediction near 90 percent, but advised that significant updating is needed before OEA can be tested further. We were told that OEA must be integrated to the current medical records system and drug protocol and clinical trial data must be updated before internal pilot testing can resume, and that testing cannot be conducted with a network partner until OEA is successfully piloted within MD Anderson.

Observation 8: Invoice review and approval to pay was not consistently documented as evidence that invoiced services and deliverables were both received and acceptable.

We selected a sample of ten paid invoices to determine whether an appropriate level of review and approval occurred to confirm that services were delivered as billed prior to submitting an invoice for payment processing, and that evidence of review and approval exists. Of the ten, email confirmation and approval to pay exists for only two. For another three, an email thread exists showing discussion regarding purchase order preparation and funding availability, and that Dr. Chin believed she had reviewed the invoices but would do so again. There was no subsequent follow-up to confirm that she had, in fact, reviewed and approved the invoices for payment. It is notable that these three sampled invoices were significantly overdue (106, 216, and 254 days from invoice to payment), with request for payment initiated after prompting by PwC (see Observation 9 on page 13). For another four invoices sampled, staff recalled having received verbal approval to pay but no documentation exists. For the remaining sampled invoice, staff assisting us with this review could not conclusively determine whether the invoice was reviewed and approved prior to payment.
**SOURCE OF FUNDING**

The total paid to vendors through August 31, 2016, under the contracts described herein is approximately $62.1 million, from the three funding types shown in Table 4. This total investment includes only contracted services; resources internal to MD Anderson (physician and mid-level time for pilot testing participation and advising, equipment, technology infrastructure, administrative support, etc.) were not quantified for this review.

<table>
<thead>
<tr>
<th>Funding Type for Payments to PwC and IBM</th>
<th>PwC</th>
<th>IBM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Educational and General Funds</td>
<td>$ 2,223,703</td>
<td>$ 15,400,000</td>
</tr>
<tr>
<td>Designated Funds</td>
<td>4,661,206</td>
<td>-</td>
</tr>
<tr>
<td>Restricted Gifts</td>
<td>16,042,991</td>
<td>23,785,560</td>
</tr>
<tr>
<td></td>
<td><strong>$ 22,927,900</strong></td>
<td><strong>$ 39,185,560</strong></td>
</tr>
</tbody>
</table>

**TABLE 4**

Two of the OEA-related contracts were presented to and received approval from the Board: the IBM agreement and the PwC Network Democratization agreement. First, in February 2013 the Board approved payment to IBM of up to $16.4 million from Hospital Patient Income and Restricted gift funds towards development of OEA, then in May 2014 approved an additional $15.6 million to be paid from Restricted gift funds (for a total of $32 million). As shown in Table 5, IBM funding sources comply with specifications as approved by the Board. Although contract expenditures currently exceed approved funding by 22.5%, additional Board approval is not required until contract fees exceed 25% of the approved amount.\(^{25}\)

<table>
<thead>
<tr>
<th>Payments to IBM Through August 31, 2016</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial Oncology Intelligence</td>
<td>$ 15,400,000</td>
</tr>
<tr>
<td>Bosarge Apollo Watson Fund</td>
<td>2,000,000</td>
</tr>
<tr>
<td>OEA Development Fund</td>
<td>11,985,560</td>
</tr>
<tr>
<td>Lung OEA</td>
<td>9,800,000</td>
</tr>
<tr>
<td></td>
<td><strong>$ 39,185,560</strong></td>
</tr>
</tbody>
</table>

**TABLE 5**

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\(^{25}\) Regents’ *Rules and Regulations* 10501: Delegation to Act on Behalf of the Board, Section 3 Matters not Delegated.
The Lung OEA fund listed in Table 5 consists of funds transferred into that account from the Pickens Fund, a gift fund from the T. Boone Pickens Foundation intended to “help ensure the future quality and productivity” of MD Anderson. The Pickens Fund is managed by MD Anderson Services Corporation, and distributions from the fund are made upon recommendation by the MD Anderson president for any specific purpose he or she deems appropriate. Minutes from the March 23, 2015, Moon Shots Executive Committee meeting show approval of a total of $8 million of Moon Shots funds to be used towards Lung OEA, with the source of that additional money to be determined at a later date. Moon Shots Program Office staff provided accounting detail indicating that the Pickens Fund was ultimately used for that purpose, with two $2 million transfers in April and July 2015, and one $4 million transfer in October 2015. One additional transfer of $1.8 million for Lung OEA from the Pickens Fund was approved by President DePinho in March 2016.

In February 2014, the Board approved contracting with an “outside firm” (PwC) and expenditure of $15 million towards Network Democratization to be made specifically from restricted gift funds intended for that purpose. As shown in Table 6 below, the $16.0 million paid under this contract came from restricted funds and Moon Shots program designated funds.27

<table>
<thead>
<tr>
<th>Department</th>
<th>Fund Type</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genomic Medicine</td>
<td>Restricted Gifts</td>
<td>$13,562,991</td>
</tr>
<tr>
<td>Moon Shots Platforms¹</td>
<td>Designated Funds</td>
<td>2,459,403</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$16,022,394</td>
</tr>
</tbody>
</table>

¹ Invoices paid from Moon Shots Platforms funds were related to Amendment 3 (BDI/TRA and NLP Annotator). The scope of work related to BDI/TRA and NLP Annotator was removed from the agreement in October 2015. Invoices were paid under Network Democratization purchase orders.

TABLE 6

Observation 9: Vendor invoices were not paid timely.

As of August 31, 2016, 29 invoices were received from and paid to IBM, and 41 were received from and paid to PwC. Although timeliness of IBM payments does not appear to have been affected after Dr. Chin’s departure in April 2015, PwC invoices were not paid timely. On average, PwC invoices received prior to April 2015 were paid within 27 days; after April 2015 the average was 101 days (for 33 invoices), with almost half paid 100 or more days after receipt and eight (24 percent) exceeding 200 days. One April 2015 invoice was not paid until January 2016, 297 days later. Staff indicated that payment of some of the invoices were delayed because

26 Pickens Contribution Letter to Leon Leach, Chairman, MD Anderson Services Corporation, and John Mendelsohn, M.D., former President, MD Anderson, March 7, 2007.
27 Additional Board approval is not required until contract fees exceed 25 percent of approved funding.
28 Invoice counts include all IBM and PwC agreements and amendments reviewed.
pledged funds have not been received from the donor. Other suggested reasons included lack of clarity over responsibility to review and approve invoices after Dr. Chin’s departure.

**Observation 10: Funds used in support of the OEA project currently have a deficit balance of $11.59 million.**

Significant deficit balances exist in philanthropy funds currently being used to support the OEA project, most significantly a $9.77 million deficit in the restricted fund specifically for development of OEA (see Appendix C: Funding Sources). We were told that MD Anderson allows deficit spending at the discretion of the department. Funds used most recently (April through August 2016) have a total deficit balance of $11.59 million as of August 31, 2016. As stated earlier, the Pickens Fund has been used since March 2015 to fund payments to IBM for OEA development.

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**CONCLUSION**

MD Anderson’s standard procedures are sufficient to ensure procurements are handled appropriately and in compliance with institution and UT System policies and State procurement law, provided they are consistently applied. However, certain aspects of procurement and contract management for the OEA project were not handled in accordance with established policies and procedures. In addition, some actions were taken that are not specific violations of policy or standard procedures but could be perceived as inappropriate or lacking in transparency.
Appendix A
Timeline of Procurement Actions

Jun. 18, 2012  Agreement with IBM for use of Watson technology to pilot “Healthcare Evidence Evaluation and Learning Service Solution”.  
Procurement method: non-competitive/proprietary.  A properly executed Exclusive Acquisition Justification (EAJ) form does not exist.  
Term: six months  
Fee: $2,400,000 fixed, payable in equal monthly payments ($400,000)

Jul. 10, 2012  Agreement with Price waterhouseCoopers (PwC) for “Business Plan for a Flagship Informatics Tool” to lead an assessment of the “capabilities necessary to build the tool” and “incorporate the outcome of the assessment into a business plan that will guide the development” of the tool.  
Procurement method: non-competitive, with a properly executed and approved EAJ form.  
Term: two months (through Aug. 31, 2012)  
Fee: not to exceed $995,500

Oct. 24, 2012  Amendment 1 to PwC “Business Plan” agreement to expand service and increase cap amount.  
Term: Extends agreement four months (through Dec. 31, 2012)  
Fee: increased to $2,222,700

Approved sources of funds: hospital patient income and restricted gift funds.

Feb. 22, 2013  IBM Change Request (PCR) 1 extends the project to five additional types of leukemia.  
Term: through Dec. 31, 2013  
Fee: $14,000,000, payable in three installments. The first payment is due upon execution of the PCR.

Jun. 2013  IBM PCR 2 provides clarifying information with no change in fee.  
According to MD Anderson legal staff, this PCR was not executed.

Jul. 11, 2013  Agreement with PwC for “Oncology Expert Advisor Value Capture” to provide program management support to MD Anderson in its collaboration with IBM to apply Watson technology to leukemia.  
Procurement method: non-competitive, with a properly executed and approved EAJ form.
Term: six months (through Dec. 31, 2013)  
Fee: not to exceed $2,360,000

Sep. 9, 2013  
Amendment 1 to PwC “Value Capture” agreement to add development of a promotional video and remove pilot adoption of OEA as a deliverable. 
Term: no change 
Fee: cap raised to $2,480,000 
*Note: This amendment was not properly executed. Because MD Anderson procurement staff could not locate a signed copy, during this review they requested that PwC sign and return the now-expired amendment.*

Nov. 22, 2013  
Request for Proposals posted: “Network Democratization of MD Anderson's Oncology Expert Advisor Powered by IBM-Watson” (RFP No. DOC315149015) 
Close date: Dec. 19, 2013

Dec. 30, 2013  
IBM PCR 3 establishes that the final PCR1 payment of $5 million will be reduced to $4 million because both parties acknowledged “that work worth 4 million USD has been completed in the final quarter of 2013….”

Jan. 3, 2014  
Regret letters sent to all “Network Democratization” proposers except for PwC and IBM.

Jan. 8, 2014  
Finalist presentations on-site by IBM and PwC in response to “Network Democratization” RFP.

Jan. 8, 2014  
Award letter sent to PwC. 
Regret letter sent to IBM.

Jan. 17, 2014  
Contract with PwC for “Network Democratization of Oncology Expert Advisor Powered by IBM-Watson” signed by both parties, to “establish feasibility with two partners of democratizing MD Anderson expertise with cognitive clinical decision support system such as OEA.” 
Term: 18 months 
Fee: not to exceed $15,000,000

Feb. 6, 2014  
Board of Regents approves engagement of “an outside firm” to “serve as the external transformation team through Phase 1A” for OEA, and “approves funds and authorized expenditures in an amount not to exceed $15,000,000” 
Approved source of funds: Restricted gift funds.

Feb. 7, 2014  
Effective date of Feb. 7 noted on PwC contract for “Network Democratization”
Mar. 27, 2014  PwC Amendment 1 signed to replace Rider 114 (Network Connections) to reflect use of a cloud-based data repository. No additional fee.

Mar. 26, 2014  IBM PCR 3.5 to “capture the mutually agreed upon refinements and enhancements to” OEA and “describes the work performed by IBM” in the first quarter of 2014.
Fee: $2,000,000 fixed  
*Note: This exceeds the Board-approved funding by 12.2%. Additional approval is not required up to 25%.*

May 12, 2014  IBM PCR 4 to complete development of OEA pilot on cloud platform and onboard two MD Anderson partners for democratization pilot.
Fee: $12,000,000 fixed  
*Note: Total IBM project cost exceeds approved funding by 85%. Approval by the Board of Regents is required.*

May 15, 2014  Board of Regents approves increase in contract with IBM to $32 million. Approved source of funds: Restricted gift funds.

May 29, 2014  PwC Amendment 2 signed to address travel expenses incurred May 5 through May 8, 2014, which exceeded allowed limits by $82/night.

Jul. 17, 2014  IBM PCR 4.5 to recognize the use of MD Anderson nurse practitioners in the project, and establish an agreed-upon hourly rate for deduction from the IBM charges agreed upon in PCR 4.

Nov. 18, 2014  IBM PCR 5 to allow that IBM will work with MD Anderson patient health information outside of the MD Anderson data center.

Dec. 24, 2014  IBM PCR 6 to describe the scope of OEA development throughout 2015, including addition of Lung development, and extend the term of the agreement through Dec. 31, 2015.
Fee: $8,000,000 fixed (inclusive of travel/expenses), to be paid in quarterly installments of $2,000,000 each.  
*Note: This exceeds the Board-approved funding by 20%. Additional approval is not required up to 25%.*

Jan. 16, 2015  PwC Amendment 3 expands use of the data interchange being developed for OEA to non-OEA uses (i.e., expands the data interchange for use in the Big Data Initiative) “to allow the ingestion of a wider variety and greater volume of clinical and research data for the Moon Shots Program and for clinical and research activities at MD Anderson.” This amendment added Big Data Initiative (BDI) and Natural Language Processing (NLP) annotator development to the OEA Network Democratization agreement.  
Fee: not to exceed $1,568,000
Mar. 23, 2015  Moon Shots Executive Committee approves funding up to $8 million towards IBM PCR 6 from Moon Shots funding sources.

May 15, 2015  PwC Amendment 4 signed with effective date of March 20, 2015, adds two Change Orders.
- PwC PCR 1, with an effective date of Jan. 6, 2015, expands use of the data interchange to interface with AT&T’s Care application, to support “complex querying,” and to produce a video for the October 2014 (prior year) Moon Shots anniversary.
  Fee: $1,285,000 fixed
- PwC PCR 2 describes development of the NLP Annotator and states, “this work effort will be managed as a separate scope of work different from the Big Data Project.”
  Fee: $2,393,813 fixed

Jul. 22, 2015  PwC Amendment 5 adds licensing language giving PwC ownership of the data interchange platform developed in early stages of the project, and modifies PwC PCR 2 (Amendment 4) to deploy “Big Data Platform” on the cloud-based node of the data interchange.

Oct. 12, 2015  PwC BDI (Big Data Initiative) Bridge Agreement indicates it is covered by the terms of the Network Democratization contract. It is unclear from the documentation provided what the scope of work and fees are that are associated with this bridge agreement. However, the agreement was superseded two weeks later on October 26.

Oct. 26, 2015  PwC Amendment 6, with an effective date of Sep. 2, 2015, specifically supersedes the bridge agreement signed October 12, expands the term of the contract through Feb. 29, 2016, and removes the Big Data Initiative and the scope of work from Amendments 3 and 5 from the agreement.
  Fee: Increases the “not to exceed” amount from $15 million to $18,750,000
  Note: This exceeds the Board-approved funding cap of $15 million by exactly (but not exceeding) 25%, which does not require Board re-approval

Oct. 26, 2015  PwC BDI Bridge Agreement establishes a separate agreement covering the Big Data Initiative. This agreement was not competitively procured; documentation in support of an exclusive acquisition justification was not provided.
  Fee: $2,466,019 (inclusive of travel/expenses), which is below the $2.5 million threshold requiring Board approval.

Nov. 13, 2015  Threshold for MD Anderson contracts requiring Board approval raised to $5 million.
Dec. 29, 2015  IBM PCR 7 to describe the scope of OEA development throughout 2016 and extend the term of the agreement through June 30, 2016.
Fee: $1,800,000 fixed (inclusive of travel/expenses), to be paid in monthly installments of $300,000 each.
*Note: This exceeds the Board-approved funding by 22.5%. Additional approval is not required up to 25%.*

Apr. 1, 2016  PwC TRA (Translational Research Accelerator) Interim Bridge Agreement, effective March 1, 2016, indicates it is covered by the terms of the Network Democratization contract. The purpose of the agreement is to continue development of the data interchange (previously termed Big Data Initiative). An EAJ was used to select PwC for this agreement.
Term: Mar. 1 through Apr. 30, 2016
Fee: not to exceed $995,000

May 4, 2016  PwC TRA Bridge Agreement, effective Mar. 1, 2016, also indicates it is covered by the terms of the Network Democratization contract. The purpose is the same as the previous interim bridge signed Apr. 1, 2016, expanding the term an additional six months.
Term: Mar. 1 through Oct. 31, 2016
Fee: increase from Apr. 1 interim agreement to fee not to exceed $4,999,046


Jun. 24, 2016  IBM PCR 8 to extend the term of the agreement one month, through July 31, 2016, with stated focus on development of OEA capabilities for lung cancer. No additional fee.

Jul. 29, 2016  IBM PCR 8.5 to extend the term of the agreement two weeks, through August 15, 2016. No additional fee.

Aug. 15, 2016  IBM PCR 8.6 to extend the term of the agreement through August 31, 2016. No additional fee.

Aug. 31, 2016  IBM PCR 8.7 to extend the term of the agreement through September 30, 2016, and discontinue support for the OEA Pilot System and OEA Demo System effective September 1, 2016. “Both systems are currently connected to ClinicStation and are not in use by MD Anderson.” No additional fee.

Sep. 29, 2016  IBM PCR 8.8 to extend the term of the agreement through October 31, 2016. No additional fee.
## Appendix B

Comparison of Scope of Work Deliverables for PricewaterhouseCoopers Contracts

The list below includes only those Scope of Work objectives, tasks, or deliverables that are notably similar. A complete list of all key objectives, tasks, and deliverables can be provided upon request.

<table>
<thead>
<tr>
<th>Agreement #: 506-22-92300</th>
<th>Business Plan for a Flagship Informatics Tool</th>
<th>Agreement #: 506-00-01209</th>
<th>Oncology Expert Advisor Value Capture</th>
<th>Agreement #: 506-00-02062</th>
<th>Network Democratization of OEA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Perform a comprehensive value analysis that will forecast the potential value derived by MD Anderson from use of Watson for Healthcare solution (e.g., value of incremental patients, new services, operating cost reduction). PwC deliverable will address whether or not the proposed value levers are measurable and attainable.</td>
<td>- List of sources and magnitude of value created from provider adoption of OEA; Analysis to determine proof of increased productivity and efficiency including definition of appropriate metrics; Assessment of key steps to capture value from each source/area of opportunity. - Financial model of OEA with analysis of identified financial opportunities and associated costs. - Design and services in connection with implementation of metrics for monitoring financial metrics to track value created from viable sources/areas of opportunity.</td>
<td>Financial model depicting revenue potential of OEA; modeling and market research to develop reimbursement strategy including pilot with a payor, an optimized revenue mix based on an identification and quantification of OEA value, and a financial impact analysis of the increased efficiency and efficacy of care delivery. Deliverables include cost of OEA implementation, reimbursement options, revenue options, efficiency improvement in care delivery and clinical trials execution, and pricing models.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Project Name & Objectives

<table>
<thead>
<tr>
<th>IBM Watson Due Diligence</th>
<th>Value Capture Assessment</th>
<th>OEA Network Democratization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conduct due diligence of IBM Watson as clinical decision support tool, including comparative analysis against similar product offerings (i.e., customer base, price-to-earnings ratio, business model) to develop a business plan and solution blueprint for OEA™</td>
<td>Assess commercial opportunities and forecast OEA™ value capture in clinical settings at the local, regional and international level, conduct pricing sensitivity analysis against four factors: OEA Members/Subscribers, Membership Services to Expanded Network, OEA Subscriptions and Referrals and Genomics Testing</td>
<td>Design and develop platform needed for pilot of a democratization network with 1-2 partners; assess, establish and demonstrate the clinical, technical, financial and regulatory feasibility for democratization using a cognitive CDS system like OEA™</td>
</tr>
</tbody>
</table>

30 Source: Dr. Lynda Chin, September 20, 2016.
Appendix C
Funding Sources (through August 31, 2016)

<table>
<thead>
<tr>
<th>FUND USED</th>
<th>Fund Type</th>
<th>Current Fund Steward / Department</th>
<th>Current Free Balance (8/31/2016)</th>
<th>Contract</th>
<th>Total Paid from Fund</th>
<th>Most Recent Payment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genomic Medicine Initiative</td>
<td>Restricted Gifts</td>
<td>Lynda Chin, Genomic Medicine</td>
<td>$ 43.19</td>
<td>PwC Network Democratization</td>
<td>$ 71,923.37</td>
<td>Jan-16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PwC Value Capture</td>
<td>$ 630,140.00</td>
<td>Feb-14</td>
</tr>
<tr>
<td>Artificial Oncology Intelligence</td>
<td>Education &amp; General</td>
<td>Chris Belmont, Inst IT Programs</td>
<td>n/a</td>
<td>IBM Watson</td>
<td>$ 15,400,000.00</td>
<td>Feb-14</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>PwC Business Plan</td>
<td>$ 2,223,702.88</td>
<td>Aug-13</td>
</tr>
<tr>
<td>Big Data Platform/TRA(^{3})</td>
<td>Designated Funds/Restricted Gifts</td>
<td>Michael Antonoff, Enterprise Business Svc</td>
<td>$(1,513,121.30)</td>
<td>PwC BDI Bridge</td>
<td>$ 2,201,803.00</td>
<td>May-16</td>
</tr>
<tr>
<td>Bosarge Apollo Watson Fund</td>
<td>Restricted Gifts</td>
<td>Lynda Chin, Genomic Medicine</td>
<td>$ 330.00</td>
<td>IBM Watson</td>
<td>$ 2,000,000.00</td>
<td>Dec-14</td>
</tr>
<tr>
<td>Low OEA Promo Video</td>
<td>Restricted Gifts</td>
<td>Lynda Chin, Genomic Medicine</td>
<td>$ 60.00</td>
<td>PwC Value Capture</td>
<td>$ 149,940.00</td>
<td>Feb-14</td>
</tr>
<tr>
<td>Oncology Expert Advisor Development Fund(^{4})</td>
<td>Restricted Gifts</td>
<td>Andrew Futreal, Genomic Medicine</td>
<td>$(9,772,671.53)</td>
<td>IBM Watson</td>
<td>$ 11,985,559.94</td>
<td>Feb-15</td>
</tr>
<tr>
<td>OEA Democratization</td>
<td>Restricted Gifts</td>
<td>Lynda Chin, Genomic Medicine</td>
<td>$ 23.44</td>
<td>PwC Network Democratization</td>
<td>$ 424,976.53</td>
<td>Jan-16</td>
</tr>
<tr>
<td>Jordan Network Democratization Pilot(^{2})</td>
<td>Restricted Gifts</td>
<td>Lynda Chin, Genomic Medicine</td>
<td>$ 41.67</td>
<td>PwC Network Democratization</td>
<td>$ 84,958.33</td>
<td>Jan-16</td>
</tr>
<tr>
<td>Lung OEA</td>
<td>Restricted Gifts</td>
<td>John Heymach, Moon Shots Disease Sites</td>
<td>$(300,000.00)</td>
<td>IBM Watson</td>
<td>$ 9,800,000.00</td>
<td>Aug-16</td>
</tr>
<tr>
<td>Various Donors/Research</td>
<td>Restricted Gifts</td>
<td>Lynda Chin, Genomic Medicine</td>
<td>$ 41.67</td>
<td>PwC Network Democratization</td>
<td>$ 84,958.33</td>
<td>Jan-16</td>
</tr>
</tbody>
</table>

$ 62,113,459.55

1 Donor pledged $34.85 million towards the OEA project in October 2013. As of August 31, 2016, $15 million remains uncollected by MD Anderson.

2 Donor pledged $500,000 towards the OEA project in March 2014. As of August 31, 2016, $400,000 remains uncollected by MD Anderson.

Source: MD Anderson Development Office
Appendix D

INFORMATION TECHNOLOGY PROJECT
MANAGEMENT AND GOVERNANCE
POLICY

PURPOSE

The selection and implementation of information technology solutions is a costly and complicated endeavor. Critical management decisions and the consequences of those decisions extend well beyond build or buy decisions. The use of formal project management policies and procedures will promote:

- Performance of key tasks and controls that lead to solutions and products that better meet stakeholder needs;
- More efficient use of fiscal and human resources;
- Reduced complexity associated with information technology (IT) projects;
- Use of consistent project processes that leverage industry best practices; and ultimately
- Successful implementation of projects that effectively balance and control scope, cost, quality, and time.

Finally, a uniform IT governance and project management practice promotes consistency and better control of IT investments and projects, thereby reducing risks and increasing project success.

This policy identifies project management practices required to complete IT projects. The goals of this policy are to (1) communicate the IT governance approval process which all IT projects must follow, and (2) provide a standard approach to managing projects by outlining project governance, accountability, and reporting based on the Project Management Institute (PMI) guidelines.

POLICY STATEMENT

The University of Texas MD Anderson Cancer Center (MD Anderson) is committed to continuously improving the delivery of IT solutions within budget, on schedule, within scope, and in a manner as to best contribute to accomplishing the institution's strategic mission. MD Anderson shall institute and use project management and IT governance practices in accordance with statutes and processes prescribed by the Texas Department of Information Resources, Texas Administrative Code (Title 1, Part 10, Chapter 216, Subchapter C, Rule §218.20-218.22), and PMI. The Vice President and Chief Information Officer (CIO) shall designate and assign resources within the Information Services Division to be responsible for developing and, on an ongoing basis, refining the project management practices and IT governance processes necessary to plan and execute IT projects at MD Anderson.

SCOPE

This policy applies to all institutional information technology projects, regardless of source of funding, staffing, and/or other resources involved in the creation, governance, management, staffing, and implementation of information technology projects at MD Anderson.
Compliance with this policy is the responsibility of all faculty, trainees/students, and other members of MD Anderson's workforce.

TARGET AUDIENCE

The target audience for this policy includes, but is not limited to, faculty, trainees/students, and other members of MD Anderson's workforce.

DEFINITIONS

Area IS Steering Team: An official MD Anderson committee chaired by a designee of the Information Systems Executive Team (ISET), working through domain specific work groups, that participates in an ISET-defined strategic planning process. An Area IS Steering Team develops area-specific IT strategies, aligns and allocates resources according to priority, determines project priorities, authorizes projects and funding, oversees all IT initiatives, evaluates project results and success, and monitors project health and progress. Proposals for new projects are routed to Area IS Steering Teams and work groups for oversight based upon the business need and process the new project supports as the steering teams are aligned by the mission areas of Patient Care, Research and Prevention, Education, and the administrative services that support the mission areas. Other steering teams providing oversight for infrastructure and IT standards, Internet strategy, business intelligence, analytics, data standards, and data quality have aligned across all mission areas.

Information Systems Executive Team (ISET): An official MD Anderson committee chaired by the Executive Vice President and Chief Business Officer that is responsible for leading the IT strategic planning process, determining the value of investment in IT, reviewing previous IT Project funding and results attained from that funding, and providing guidance on institutional IT policies.

IT Governance: A management process that establishes decision rights and an accountability framework for IT decision-making. IT Governance specifies what decisions must be made to ensure effective management and use of IT funding, staffing, and other resources and how the decisions are made.

IT Project: An initiative that provides technology solutions (e.g., products, services, or results) characterized by well-defined parameters, specific objectives, common benefits, planned activities, a scheduled completion date, an established budget with a specified source of funding, and requires in excess of 80 hours of work effort to complete.

IT Project Portfolio: A logical collection of IT projects and project proposals organized around Area IS Steering Teams and Workgroups.

Project Management Practices: One or more of the documented and repeatable activities through which IT management professionals apply knowledge, skills, tools, and techniques to satisfy project activity requirements.

Project Manager (PM): An IT professional who is responsible for managing the scope, schedule, and cost of an IT project. The PM has the requisite experience and competencies to meet project requirements in the project management knowledge areas of information technology, integration, scope, schedule, cost, quality, resources, communication, risk, and procurement (acquisition) management.

Project Sponsor: The Project Sponsor is a non-IT stakeholder, Director, or higher member of management who has operational and functional accountability for the project, whose area of responsibility will receive the greatest benefit from the project's successful completion, and who has sufficient authority to remove project roadblocks. The sponsor also has authority to influence work
process changes needed to successfully complete the project. The Project Sponsor assumes overall responsibility for the entire project from a business perspective and becomes the final asset owner.

Project Team: The individuals assigned the responsibility for performing the project work as a part of their regular assigned duties. The team could consist of members across departments. The project team is accountable to and takes direction from the Project Manager for project related tasks.

Project Management Methodology (PMM): Scalable processes and tools (e.g., forms, charts, decision documents, and/or templates) designed to drive a repeatable, consistent outcome and manage projects of any size or complexity, including the minimum templates required by the IT Governance processes. PMM phases include Initiation, Analysis and Planning, Execution and Control, and Close-out. PMM processes, tools, and templates are located on the Project Support and Coordination Services (PSCS) Intranet site and serve as the MD Anderson standard for project management practice. The PMM leverages the PMI’s Project Management Book of Knowledge® as a reference standard.

Project Support and Coordination Services (PSCS): A department within the Information Services Division designated by the CIO to oversee the IT governance process, Area IS Steering Teams and Work Groups, and management of the IT Project Portfolio. PSCS provides services through supplying information, knowledge, processes, training, tools, templates, and techniques for project management, prioritization and governance, and related education.

Technology Sponsor: An IT Director or member of IT management, designated by the office of the CIO, who assumes overall responsibility for the project from an IT perspective and typically becomes responsible for operations and maintenance of the asset once the project is complete.

PROCEDURE

1.0 Roles and Responsibilities

1.1 The Project Sponsor is responsible for defining the business case and justifying the investment in IT to the Area IS Steering Team, including overseeing the project’s budget and expenditures. Accountable to the ISET and steering team through PSCS, the Project Sponsor has responsibility for:

A. Empowering the Project Manager with the authority necessary to manage and control the project, thereby ensuring project success;

B. Defining project goals, objectives (including alignment with institutional strategies and goals), and success performance measures;

C. Identifying the impact of the project on operations and services;

D. Ensuring business processes are adjusted to optimize benefits achieved from IT deployment;

E. Setting expectations for the end product or results, establishing the minimum success criteria, and ensuring the benefits identified as an outcome of the project are realized, along with

F. Championing the project, arbitrating conflict, mediating negotiations, removing institutional obstacles, and providing the project team with an escalation path for project issues.
1.2 The Technology Sponsor is responsible for:

A. Identifying the technology solution, identifying the costs for the project, and assigning resources to the project based upon the priorities defined by the IT governance committees;

B. Monitoring consumption of resources and adjusting resources as priorities change;

C. Establishing the solution or System Development Life Cycle (SDLC) methodology best suited for the technology solution and ensuring project and SDLC records are documented and retained, as appropriate; and

D. Ensuring the quality and outcome of the project and the final IT solution. With overall accountability, the Technology Sponsor is responsible to the Area IS Steering Team (through PSCS) and office of the CIO for the project from an IT perspective.

1.3 The Project Manager is accountable to the Technology Sponsor, the Project Sponsor, and the Area IS Steering Team through PSCS. The Project Manager works on their behalf and has responsibility for:

A. Managing the development of the project scope statement and project plans which includes, but is not limited to, the charter, scope statement, budget, schedule, risk assessment, communication plan, and resource plan;

B. Monitoring schedule and costs compared to plan;

C. Identifying problems that could potentially extend the schedule or overrun costs;

D. Taking, directing, and recommending corrective action when variances threaten project success;

E. On a monthly basis, transparently reporting through PSCS to the Area IS Steering Team the status and health of the project;

F. Identifying roles and responsibilities of all Project Team members and serving as the central point of contact for the Project Sponsor, Project Team, Technology Sponsor, and stakeholders (including vendors); and

G. Ensuring the project deliverables are complete and within realistic project timelines and escalating issues and concerns to his/her managers, Project and Technology Sponsors, and Area IS Steering Teams through PSCS.

1.4 Institutional managers and supervisors are responsible for:

A. Ensuring all IT projects have been advanced through the IT governance prior to work starting or allocating resources;

B. Allocating resources to those projects approved by the Area IS Steering Teams;

C. Ensuring IT projects are managed using the institution’s PMM; and

D. Ensuring that Project Managers report the status and health of their projects on a monthly basis, through PSCS, to the Area IS Steering Team.

1.5 PSCS is responsible for supporting the PMM and IT Governance processes; providing logistical and administrative support to the IT Governance committees; developing tools, templates, and processes for project management and governance decision-making; and escalating issues and concerns to the Area IS Steering Teams and work groups. PSCS is
accountable to ISET, Area IS Steering Teams, and the office of the CIO for the monitoring of IT Project status, progress, and health and the publishing of IT Project portfolio summaries by aggregating financial and project performance data.

2.0 Procedure

2.1 Refer to IS Governance for current IT Governance processes and procedures.

2.2 Refer to Project Management Methodology for tools, templates, and processes to access the material.

3.0 Record Retention Requirements

3.1 Project deliverables in the form of project plan and SDLC documents including requirements, testing plans, outcomes, and technical specifications are to be retained and archived by the IT department responsible for the project.

3.2 Project records should be retained for a period of two years, at minimum, or until the next upgrade. IT management may choose to retain records longer for business or re-use purposes.
ATTACHMENTS / LINKS

IS Governance.

Project Management Methodology.

Project Support and Coordination Services (PSCS).

RELATED POLICIES

None.

JOINT COMMISSION STANDARDS / NATIONAL PATIENT SAFETY GOALS

None.

OTHER RELATED ACCREDITATION / REGULATORY STANDARDS

None.

REFERENCES


The University of Texas System Audit Office
Special Review of Procurement Procedures Related to the
M.D. Anderson Cancer Center Oncology Expert Advisor Project

UTMDACC INSTITUTIONAL POLICY # ADM1048

POLICY APPROVAL
Approved With Revisions Date: 08/28/2013
Approved Without Revisions Date: 
Implementation Date: 08/28/2013
Version: 19.0

RESPONSIBLE DEPARTMENT(S)
Information Services
Appendix E
Interviews and Resources

M. D. Anderson
Vince Adams  Associate Director, Supply Chain Management
Robert Adkins  Director, Sourcing and Contract Management
Michael Antonoff  Executive Director for Enterprise Business Services, Institutional Analytics & Informatics, and Big Data
Greg Barbosa  Institutional Analytics & Informatics Program Manager, Translational Research & NLP
Chris Belmont  Vice President and Chief Information Officer
John Bingham  Vice President for Performance Improvement
Evertha “Cathy” Davis  Department Administrator, Genomic Medicine
Ronald DePinho, M.D.  President
Dan Fontaine, J.D.  Executive Chief of Staff
Andy Futreal, Ph.D.  Chair ad interim, Genomic Medicine
Joxel Garcia, M.D.  Executive Director, Cancer Control and Prevention Platform
Maria Gelormini  Associate Vice President, Development Services
Shawn Grover  Supervisor, IS Fiscal Operations
Steve Haydon, J.D.  Vice President and Chief Legal Officer
Donna Hemphill  Associate Vice President, Business Analytics
John Heymach, M.D., Ph.D.  Chair, Thoracic/Head & Neck Medical Oncology
Hagop Kantarjian, M.D.  Chair, Leukemia
Rebecca Kaul  Chief Innovation Officer
Matthew Kazsuk  Manager, Accounts Payable
Allyson Kinsel, J.D.  Vice President and Chief Compliance and Ethics Officer
Sherri Magnus  Vice President and Chief Audit Officer
Chad Mavity, J.D.  Senior Legal Officer, Legal Services
Chris McKee  Vice President for Business Operations
Emily Roarty  Scientific Manager, Thoracic/Head & Neck Medical Oncology
Brett Smith  Executive Director, Platform Technology in Genomic Medicine
Paul St. Amant  Associate Vice President, Supply Chain Management
Less Stoltenberg  Executive Director and Chief Information Security Officer

UT System Administration
Lynda Chin, M.D.  Associate Vice Chancellor for Health Transformation
(former chair, M. D. Anderson Department of Genomic Medicine)
Jerry Fuller  Director, Contracts and Procurement
Randa Safady, Ph.D.  Vice Chancellor for External Relations
Daniel Sharporn, J.D.  Vice Chancellor and General Counsel

Others
Keith Perry  Chief Information Officer, St. Jude Children’s Research Hospital
(former Chief Information Officer ad interim, M. D. Anderson)
SECTION 2

Response by The University of Texas System

December 2016
December 13, 2016

Mr. J. Michael Peppers  
Chief Audit Executive  
The University of Texas System  
Wells Fargo 5th Floor  
SYSTEM MESSENGER

Dear Mike:

On behalf of The University of Texas (U. T.) System, I am pleased to offer the following observations concerning the Special Review of Procurement Procedures Related to the M. D. Anderson Cancer Center (MDACC) Oncology Expert Advisor (OEA) Project.

First, this evaluation was conducted by the U. T. System Audit Office in order to avoid any perceived or real conflicts of interest that may have arisen by a MDACC internal review of these matters. The fact that U. T. System undertook this audit should not be interpreted to reflect any lack of confidence in the capabilities or commitment of MDACC to oversee and assess the conduct of its procurement processes. Quite to the contrary, MDACC welcomed an independent review and committed to adhere to any of the resulting recommendations.

Second, the U. T. System Audit Office is to be commended for their diligence and thoroughness in the conduct of this review, examining documentation where it existed, and interviewing a large number of persons at MDACC who were involved in the business support functions for OEA in order to assure a balanced and fair assessment.

Third, current and former MDACC personnel are to be commended for their cooperation with the audit team, and in particular, for sharing data and perspectives that were essential to preparing a full and valid report.

Fourth, the OEA Project was a highly visible, large scale, multi-year, continuously evolving research and development effort. Many offices at MDACC were involved in aspects of managing this project, and accordingly, the documentary record is somewhat fragmented and incomplete. It is challenging, therefore, to
reconstruct exactly when, where, how, and why various procurement actions did or did not occur. The auditors have done an admirable job in piecing together the historical record, but understandably there may be some differences of opinion between observers, particularly when there are gaps in the documentary evidence.

Fifth, it is clear that MDACC did not adhere to all of its procurement policies and procedures with respect to OEA. Of particular concern are: (a) the lack of competitive bidding for outside contractual services, and (b) the fact that these contracts were written serially for amounts just under the threshold for review by the U.T. Board of Regents. It is not clear that the OEA work was dissected into smaller dollar contracts in order to avoid review by the Board, but at a minimum, when multiple contracts are written just under the threshold dollar values for review, it leaves the appearance that good governance practices were not being followed.

Sixth, because this review was limited to procurement for OEA, one cannot determine whether the issues noted above are unique to this large, complicated project. No inferences are made beyond OEA, but the question arises, nevertheless, whether similar deficiencies might be noted for other large, complicated contracts at MDACC. Regardless of whether or not these are isolated deviations from institutional policy, going forward, MDACC must ensure compliance with both internal and U. T. System policies and procedures.

Seventh, the auditors suggest that the OEA Project should have been reviewed and approved through established information technology (IT) governance. This is based upon the wording of the IT policy (ADM 1048), which specifies that it applies to “all institutional information technology projects.” An alternative interpretation has been advanced that the IT Policy does not apply to research and development efforts, such as OEA. Moreover, the lead IT personnel at MDACC were involved in OEA and, at many steps along the way, could have mandated review if they thought it was applicable. The ambiguity in whether ADM 1048 is intended to apply to research and development IT projects should be addressed by MDACC in order to avoid similar confusion in the future.

Eighth, the audit concludes that invoices to contractors were paid regardless of whether the original contracted scope-of-work was completed. It is clear that the documentary record is incomplete in demonstrating that the contractors met agreed upon milestones. Another perspective, however, is that the research and development nature of the work inevitably led to goals and expectations that shifted
over time, often making original contracts moot in terms of specified deliverables. To the extent that targets and expectations shifted over time, the incomplete documentary record makes it impossible to determine whether or not the revised milestones were met. For the future, MDACC must improve its record systems to support payments to contractors on projects that evolve over time.

Finally, and perhaps most importantly, this audit suggests that even well-developed institutional policies and procedures can be ineffective if, for whatever reason, those who are responsible for enforcing them do not do so. For the management of future large and complex projects, MDACC would be well-served to assure compliance by creating stronger, independent oversight. One such approach is the use of an external advisory group that can help document and validate assessment of contractor performance and determine whether appropriate targets and milestones have been met. In addition, employees who feel that policies and procedures are not being followed should be encouraged to express their concerns without fear of reprisal.

In conclusion, this audit has identified a number of opportunities for improvement of procurement and project management at MDACC. U. T. System will work with MDACC to assure that appropriate actions are taken to address these issues.

Sincerely,

[Signature]

William H. McRaven
Chancellor

/whm

cc: Raymond S. Greenberg, M.D., Ph.D.
SECTION 3

Response by M.D. Anderson Cancer Center

January 2017
MEMORANDUM

TO: J. Michael Peppers
    Chief Audit Executive
    The University of Texas System

FROM: Dan Fontaine
    Executive Vice President, Administration
    UT MD Anderson Cancer Center

SUBJECT: MD Anderson Executive Management's Responses to the Observations provided in the Special Review

GENERAL COMMENTS AND EXECUTIVE MANAGEMENT'S OVERALL RESPONSE

We appreciate the time and effort by the audit team in the review process and preparation of the Special Review report. Additionally, we appreciate the opportunity to respond to the specific observations included in the report. While there may be disagreement about the purposes of the OEA project, it would appear that all parties agree that the circumstances confronting MD Anderson executive management and the various departments involved in the procurement of external services in support of the project were unique.

The leadership of a major multi-departmental institutional research and development project utilizing significant institutional financial and personnel resources by a department chair who was also the spouse of the president of the institution created difficulties and confusion for staff in regards to their responsibilities and roles specific to those particular circumstances. The difficulties, both real and potential in such an arrangement, were known to the executive leadership of The University of Texas System, as well as executive management of MD Anderson, prior to and certainly during the pendency of the project. Moreover, because of the unique nature of the project, and its surrounding circumstances, MD Anderson executive management is certain that extrapolation of the actions, or lack thereof, identified in the Special Review to an overall level of deficiency in the MD Anderson procurement process would be erroneous.

Additionally, as it is anticipated that the unusual circumstances involving project leadership will not be replicated, neither will the deficiencies of adherence to standard processes noted in the Special Review be repeated. In that regard, this Management Response is not intended to concur with or dispute all statements made to the review team, who were required to report certain assertions made during the review without the ability to verify those assertions. Rather, these responses are intended to acknowledge problems with what occurred, and a commitment to ensure that those discrepancies were exceptions and not systemic.

1 Documents in the possession of The University of Texas System executive leadership reflecting communications with MD Anderson leadership during the period of June-July 2011 and March-June 2013.
Accordingly, MD Anderson executive management acknowledges that all of its processes are subject to improvement. Even though the circumstances involved were unique, steps have already been taken, and more will be taken in the future, as discussed in this document, to ensure the highest transparency and compliance with best practices in institutional procurement processes.

Subject to these general observations, executive management of MD Anderson has the following responses to the observations made in the Special Review:

RESPONSE TO OBSERVATION 1:
Procurement of support services from outside entities for any and all major institutional projects will be either a result of competitive bidding processes or, in appropriate circumstances, formally documented exclusive acquisitions, unless otherwise exempted from such processes by the The Board of Regents and / or The Regents' Rules of The University of Texas System. Moreover, evidence of the usual processes was recently demonstrated when subsequent to the suspension of work on OEA, another major digital project involving outside contractor assistance (TRA) was secured through a competitive bidding process and placed on the consent agenda for appropriate approval.

RESPONSE TO OBSERVATION 2:
All project leaders for projects that involve the execution of institutional contracts are instructed that only those with written authority delegated to them by the president of the institution may sign contracts. This policy has been in existence for decades and is understood by the overwhelming majority of project leaders. Additionally, in instances in which the policy may have been inadvertently violated, when discovered, Legal Services notifies individuals of the violation and the need for corrective action, so long as the involved individual is still employed by MD Anderson. This will be reiterated to all project leaders in the future.

RESPONSE TO OBSERVATION 3:
While there is some disagreement as to whether this project qualified for review and approval by ISET, in the future any projects involving digital science and use of IT resources or other institutional resources for development of digital science based systems will be reviewed by ISET, unless the president of the institution dictates otherwise. It is important to note that ISET is advisory to the president and exists to assist executive management in decision making concerning IT operations and projects. Accordingly, matters may occasionally be decided upon by executive management in such a way that differs from recommendations made by ISET.

RESPONSE TO OBSERVATION 4:
It is the usual MD Anderson practice to have contracts with outside vendors provide specific deliverables. Moreover, when deliverables change it is the practice of Supply Chain and Legal personnel to require amendments to existing agreements to match the change in deliverables. In order to ensure adherence to the institution’s standard practices, MD Anderson Internal Audit will include a compliance audit in its audit plan for next fiscal year to confirm institutional procedures were followed for major outside vendor contracts.

RESPONSE TO OBSERVATION 5:
Project leadership for both OEA and TRA made the decision to include work for TRA under the original PWC contracts with a different source of funding. This has since been remedied with a separate competitively bid
agreement for TRA with a different source of institutional funding, and appropriately placed on the consent agenda for approval.

RESPONSE TO OBSERVATION 6:
While fees were set below Board approval thresholds, the intent as expressed by project leadership was to ensure a maximum dollar cap on each segment of work. This approach, requested by project leadership, occurred because Supply Chain and Legal personnel were not made aware of the next work to be accomplished until each agreement was close to expiring with a simultaneous request for an agreement to cover only the next increment of work to be supplied by the vendor. This was a unique approach and will not be replicated in the future. The usual process, and the one that will be adhered to in all other instances, is for project leadership to meet with Supply Chain and Legal Services to outline prospectively the totality of the potential work, including all extensions, contemplated by project leadership.

RESPONSE TO OBSERVATION 7 & 8:
For projects involving significant purchase of services from outside vendors, project leadership is responsible for confirming to Supply Chain and executive management that contracted services were delivered as agreed upon and that invoice review and approval to pay has been consistently documented. The unique circumstances for this project, including a lack of clarity as to supervision of project leadership described in the general comments above, led to a unique discrepancy that is particular to the circumstances reviewed in this Special Review.

RESPONSE TO OBSERVATION 9 & 10:
Vendor invoices were not timely paid due to an attempt by financial management to adhere to the intended source of a restricted gift for payment of the invoices. The alternative source of funds used was the Pickens Fund earnings which is funding that can be used at the discretion of the president of the institution. It appears that the original source of the restricted gift in question failed to meet its entire pledged amount and is unlikely to do so in the future.
SECTION 4

Response by Lynda Chin, M.D.

January 2017

Auditor’s Note: In observation 1 (on page 2) of Dr. Chin’s response, she notes that the policy statement cited in the report, ADM1048: MD Anderson Information Technology Project Management and Governance Policy, has an approval and implementation date in August 2013, and questions whether a similar policy existed at the time the project was initiated. We confirmed that the prior version of ADM1048, with an approval and implementation date in April 2010, was in effect at that time, and that the policy statement and definitions are unchanged in the current version. As with the current version, the scope in the prior version indicates that the policy applies to all members of MD Anderson’s workforce.
MEMO

To: Michael Peppers  
Chief Audit Executive

CC: Chancellor William Mcraven  
Executive Vice Chancellor Ray Greenberg  
President Ron DePinho, MD Anderson Cancer Center

From: Lynda Chin, MD  
Director, Institute for Health Transformation  
Associate vice chancellor and Chief Innovation Officer for health affairs

Date: January 3, 2017

Re: Final Report on “Special Review of Procurement Procedures Related to the M. D. Anderson Cancer Center Oncology Expert Advisor Project”

Mr. Peppers, I provide here my official response to your report referenced above. I do not agree with your findings #3 and #7 stating that “the OEA project was not approved through established Information Technology (IT) Governance and did not follow required IT governance processes”, and that “Invoices were paid in full regardless of whether contracted services were delivered as agreed upon”.

The finding #3 is based on the premise that the OEA project was an IT project similar to or typical of ones managed and executed by a hospital’s IT team, therefore, under governance of such body (ISET within MD Anderson). This premise is unsubstantiated and inconsistent with available evidence. I believe it reflects a lack of understanding of the difference between operation and research when it comes to the rapidly evolving domain of information technology.

As I have explained to you during our interviews, development of the OEA artificial intelligence system was and still is a R&D innovation project, not an implementation or operation IT project. I have provided evidence in support of my justification based on the functionalities and expertise required for the project (see table below), which I am uniquely qualified to produce as the PI who envisioned, conceptualized, and designed the OEA system, in addition to leading its development. My position is also supported by numerous scholarly articles by others and conferences in artificial intelligence across multiple industries (not limiting to healthcare) these past 5 years, including the two reports by the Obama administration this past October, on “Preparing for the Future of Artificial Intelligence” and “The National Artificial Intelligence Research and Development Strategic Plan” (attached). These calls for actions and national R&D strategy in AI are strong external validation of my expert opinion that
developing AI applications in healthcare is not an IT project and does not fall under hospital IT operation.

**Conceptualization of OEA® System: Functionalities and Expertise Requirements**

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<thead>
<tr>
<th>Clinical Needs as Drivers</th>
<th>Business Needs as Context</th>
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<tr>
<td>• Keep up with the complexity of medicine</td>
<td>• Support the mission</td>
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<td>• Volume of medical knowledge</td>
<td>• Innovate to lead</td>
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<td>• Variety of patient data</td>
<td>• Create value</td>
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<tr>
<td>• Velocity of advances</td>
<td>• Patient outcome</td>
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<td>• Veracity of data</td>
<td>• Opportunities</td>
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<td>• Reduce the variability in practice</td>
<td>• Accelerate R&amp;D</td>
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<td>• Evidence-based standard</td>
<td>• Industry collaboration</td>
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<td>• Coordinated transition of care</td>
<td>• Impact: # lives touched</td>
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<td>• Learn from every patient</td>
<td>• Adapt to evolving industry business models</td>
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<td>• Aggregate expertise</td>
<td>• Consumerism</td>
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<td>• Augment capabilities</td>
<td>• Precision medicine</td>
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<td>• Make life easier</td>
<td>• Value-based reimbursement</td>
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<td>• Embed into clinical workflows</td>
<td>• Protect from unnecessary risks</td>
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<td>• Practice at the top of licensure</td>
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<td>• Improve experience</td>
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<td>• Skill sets required</td>
<td>• Security</td>
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<td>• Understanding of clinical practice</td>
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<td>• Expertise on which patient data are critical and what evidence are priority</td>
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<td>• Competency to make decisions on requirement and assess accuracy</td>
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**IT, Regulatory and Clinical Operation as Infrastructure Support and Enablement**

With that background context, I provide the following observations suggesting a lack of evidence or objectivity in your conclusion.

1. The ISET policy (ADM1048) you cited as basis of your interpretation was approved with an “Implementation Date: 8-13-2013”, which meant it was not active at the time of OEA project initiation at 2012. Was a similar policy active during the project initiation time? And was such policy reasonably available or known to research faculty or chairs or division heads? I was not able to search and identify either the 2012 or the CURRENT ISET policy on MD Anderson intranet then and now.

2. You have not produced documentation that an AI project like OEA was envisioned or intended in the scope of the ISET policy when it was approved and implemented by the IT leadership at MD Anderson. This is pertinent in light of your own acknowledgement that wording of the ISET policy is subject to interpretation, and the fact that application of AI in medicine did not enter the healthcare conversation until 2012 (since the OEA project was one of the first two
healthcare related AI projects in the world). I posit that an AI project like OEA was never imagined or envisioned as one of the “institutional information technology projects” within the scope of ISET governance. This is supported by documented actions of the IT/IS and institutional leadership (CIO, deputy CIO, business and clinical operation VPs) who were responsible for ISET governance, specifically the fact that none of these individuals ever once suggested (verbally or in writing) to me (the PI) or to my supervisor (Exec Vice Chancellor for Health Affairs at UT System) that the OEA project should go through the ISET governance process. These institutional leaders had numerous opportunities to raise this requirement since

a. the CIO, deputy CIO, CTO and other director level IT personnel were intimately engaged and actively participated on a weekly basis during the initiation of and throughout the project;

b. the IT leadership was part of the MD Anderson’s Executive Committee which approved the OEA project

c. the IT leadership was involved in negotiation of OEA related contracts which were executed by MD Anderson.

In the absence of any documented request from these leaders who were most familiar with the ISET policy, one can only conclude that they did not interpret the ISET policy as relevant to the OEA project. Therefore, the conclusion that OEA fell under ISET jurisdiction because “it involves software development” was unsubstantiated, based only on your personal uninformed interpretation of a vaguely worded policy that was not active at the time of project initiation.

3. Your dismissal without justification of my expert opinions in my role as the PI who conceptualized, designed and led the project, coupled with your disregard of the obvious interpretation as inferred by the actions of the IT leadership as noted above, calls into question the objectivity of your findings.

Lastly, regarding finding #7, it is factually inaccurate to suggest that invoices were paid for work not performed, as deliverables for each invoice was clearly documented. Rather, it was the case that the original contracted deliverables had shifted or were changed over the 18 months project period. Such shift and adaptation were expected given the R&D nature of the OEA project; they were collective decisions based on extensive discussions during weekly team meetings (in which the IT leadership participated). I do acknowledge, as the PI, that these discussions and collective decisions could have been better documented. However, I contest the misleading statement of finding #7.
Attachments to Response by Lynda Chin, M.D., are publicly available as follows:

“Preparing for the Future of Artificial Intelligence”
Executive Office of the President, National Science and Technology Council Committee on Technology
October 2016
https://www.whitehouse.gov/sites/default/files/whitehouse_files/microsites/ostp/NSTC/preparing_for_the_future_of_ai.pdf

“The National Artificial Intelligence Research and Development Strategic Plan”
National Science and Technology Council, Networking and Information Technology Research and Development Subcommittee
October 2016
https://www.whitehouse.gov/sites/default/files/whitehouse_files/microsites/ostp/NSTC/national_ai_rd_strategic_plan.pdf