



# **State Fiscal Year 2019 - 2021 Higher Education Department IT Strategic Plan**

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## EXECUTIVE SUMMARY

The New Mexico Higher Education Department (NMHED), through its various programs and divisions, seeks to promote accessibility to education for all New Mexicans. Information technology is a key element of this effort. Some of the areas in which this technology is utilized are managing loans for financial aid, tracking student success, providing common course numbering data, and delivering data for policy makers.

The IT Division helps facilitate the workflow of each NMHED division and enhance the overall efficiency of the agency, with the ultimate goal of contributing to the greater accessibility to education. The work and goals of the IT Division are done in alignment with the Higher Education Department's and the State's IT strategic goals.

NMHED is responsible for creating and administering a formula to fund the state's public higher education institutions. The Information Technology (IT) and Research & Planning (P&R) Divisions work together to collect and validate data and use them as the basis to run the funding formula. To that end, the Data Editing and Reporting application, named [eDEAR](#), was entirely redesigned and rebuilt to be more user-friendly and secure and to utilize the latest engineering practices and architectural style.

Leadership has made it a priority to leverage and more widely share the vast information the agency has collected and which IT manages. Consequently, it is a high priority to fully modernize and secure all information systems. SFY19 and SFY20 will therefore see the implementation of an off-site Business Continuity and Disaster Recovery solution and the move of core services to hosted solutions provided by DoIT and/or commercial computing platforms ([DBaaS](#), [IaaS](#) and [SaaS](#)).

Also in SFY19 and SFY20:

- Advanced analytics tools for data and trends analysis will be procured and deployed
- Custom-build, legacy applications will be replaced by [COTS](#) and/or subscription solutions.
- The outdated [agency website](#) will be redesigned
- Key in-house applications will be rebuilt using a modern development framework
- Further improvements in computing runtime environments and database operations will be made

Finally, a priority over the next three years is to move away from manual and paper-based processes. Accordingly, two complementary projects are already in the planning phase: Conversion of all paper and PDF forms to web-forms and the implementation of electronic signatures.

# I. AGENCY OVERVIEW

## A. AGENCY MISSION

The New Mexico Higher Education Department will provide financial, academic, and policy oversight to the NM public higher education institutions for the purpose of promoting efficiency, accountability and student success.

## B. AGENCY GOALS

NMHED fosters and guides a system of higher education that best meets the needs of the citizens of the state by providing financing to and oversight of all of the state's public universities and colleges. Four American Indian public institutions and four regionally accredited independent private colleges participate voluntarily in a number of agency programs. The agency also has regulatory authority over private for-profit institutions operating within the state.

## C. ORGANIZATION STRUCTURE

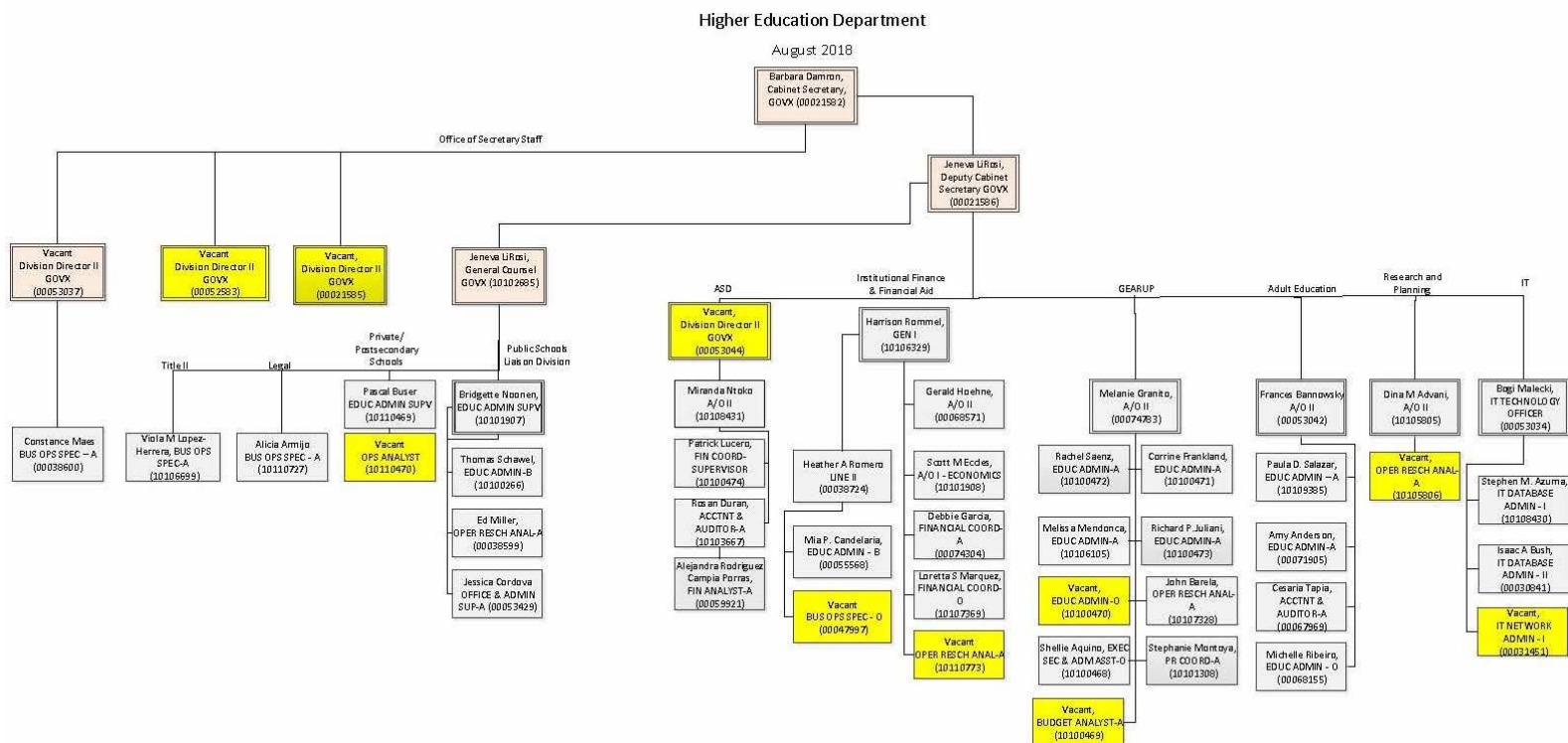


TABLE I.1: NMHED Organizational Structure

NMHED consists of several divisions that sponsor various education-related programs. These are as follows:

1. [GEAR UP](#)'s mission is to increase the number of underrepresented students who are prepared to enter and succeed in Postsecondary education.
2. The [Institutional Finance and Financial Aid Division](#) is responsible for the fiscal oversight of 32 colleges, universities and special schools and is dedicated to helping students find money to attend college and to make informed decisions about financial aid programs for all who qualify.
3. The [Adult Education Division](#) serves adults, 16 years of age to become literate and obtain the knowledge and skills necessary for employment and self-sufficiency.
4. The [Private Postsecondary Schools Division](#) issues licenses or letters of exemptions to private postsecondary Institutions allowing these institutions to legally operate in the state.
5. The [Policy Division](#) is involved with a number of activities, including monitoring the transfer and articulation operation and the associated General Education Core Course listings.
6. The [Research and Planning Division](#) provides quality information and planning support to the higher education community through collaborative data collection, analysis and reporting.

## II. IT DIVISION OVERVIEW

### A. VISION AND PRIORITIES

To facilitate and transform the business processes of the department and provide the highest possible value to all internal and external stakeholders.

Priorities are as follows:

- Increasing information and data security
- Increasing information and data availability
- Standardizing application development on [agile methodology](#)
- Streamlining service delivery
- Enhancing security, privacy, and accessibility
- Investing in the workforce through training and additional staff
- Becoming more responsive and transparent to stakeholders
- Consolidating services and reducing costs via virtualization and hosting

## ***B. IT ENVIRONMENT***

### ***1. Major Applications***

<b>Name</b>	<b>Function</b>
BAS	Legislative bill analysis system
CCND	Common Course Numbering Database portal
eDEAR	On-line data reporting system for all public postsecondary institutions in New Mexico  (ref.: <a href="https://edear.hed.state.nm.us/app">https://edear.hed.state.nm.us/app</a> )
FA application	Financial Aid application system  (ref.: <a href="https://apps.hed.state.nm.us/finaid/Login.aspx">https://apps.hed.state.nm.us/finaid/Login.aspx</a> )
SharePoint	Manage selected department documents and provides limited collaboration and information-tracking services  (ref.: <a href="http://sharepoint.hed.state.nm.us">http://sharepoint.hed.state.nm.us</a> INTRANET ONLY)

**TABLE II.1:** Major NMHED Software Applications & Links

## 2. Infrastructure

Systems	Operations	Servers and/or Services
HPE server systems and HPE SAS storage	VMware vSphere running 31 virtual server instances	<ul style="list-style-type: none"> <li>• Active Directory servers</li> <li>• Ubuntu LTS application servers</li> <li>• Windows Server 2012R2 File Share servers</li> <li>• Windows Server 2008 database servers</li> <li>• Windows Server 2008 application servers</li> <li>• SharePoint server system</li> </ul>
Back-up systems	Disk- and tape-based back-ups	Disk- and tape-based back-ups
Juniper & HP switches and Palo Alto and Cisco routers and Meraki WPAs	Network communications and security	<ul style="list-style-type: none"> <li>• VPN</li> <li>• DMZ</li> <li>• Zero-trust subnets</li> <li>• External IP traffic</li> <li>• Wireless access</li> </ul>

**TABLE II.2:** NMHED IT Infrastructure



### 3. Projects

PROJECT NAME	PURPOSE	CERTIFIED/ STATUS	RELATIONSHIP TO PRIORITIES & IT ENVIRONMENT
FA application redesign	Rebuild old, .Net-based application into a responsive, Java-based one	In-house; initiation phase	Modernization and improved User Experience
Department website upgrade	Replace outdated and unfriendly website	In-house; initiation phase	Modernization and improved User Experience
Data migration	Move data to a highly-secure hosted, DBaaS model	In-house; initiation phase	Modernization, improved security and, improved user services
Implement Electronic Signature	Supplant inefficient paper-based forms and processes	In-house; initiation phase	Moving away from inefficient paper-based forms and processes
Implement offsite <a href="#">BC/DR</a>	To provide business continuity and data security	In-house; planning phase	Modernization, improved security and, improved user services
Capital Projects application	Create an fully digital, application-based Capital Projects solution	In-house; initiation phase	Moving away from inefficient paper-based forms and processes
IF Data System	Create a collaborative multi-organization, application for managing Institutional Finance data	TBD	Moving away from inefficient paper-based forms and processes

**TABLE II.3:** Current and planned IT projects

#### 4. Challenges

NMHED IT has two primary challenges, both which should be significantly mitigated in SFY19. They are (1) limited IT staff resources and (2) managing costly legacy data and systems. Specifically:

<b>Challenge</b>	<b>Details</b>	<b>Mitigation</b>
Limited IT staff	In the last 3 years, NMHED has lost 50% of its IT staff. We are now rebuilding, having filled the IT Director post in SFY18. The remaining 25% (1 FTE) is for the critical infrastructure engineer and a top priority.	Hire a Systems Administrator II in SFY19 to help us catch up on 3 years of outstanding infrastructure upgrades
Legacy data and systems	<p>Reel tapes with 20+ year-old data, lack of redundancy across production server systems (AD excepted), decommissioned equipment requiring disposal, looming end-of-life on critical database systems. These are but a few outstanding tasks requiring our attention.</p> <p>The most important requirement for these tasks is increasing data and access security.</p>	<ul style="list-style-type: none"> <li>• Migrate databases to hosted systems/services, e.g., DoIT and/or commercial cloud computing services</li> <li>• Convert and digitize 20-40 year data</li> <li>• Migrate, virtualize and make redundant cost database and application systems</li> <li>• Deploy application and database development, test and QA systems</li> <li>• Create network and systems diagrams</li> <li>• Update security and application support plans</li> <li>• Perform back-up data restore and verification</li> </ul>

### III. SFY 2018 ACCOMPLISHMENTS

#### A. SFY 2018 STRATEGIC IT ACCOMPLISHMENTS

<b>IT STRATEGIC GOAL</b>	A robust and secure IT infrastructure that supports on-demand access to information
<b>SFY 2018 Strategy</b>	Procure and deploy new high-capacity switches and server systems and expand storage by 20 TB
<b>Metric</b>	Baseline based on previous operational measures, determine: <ul style="list-style-type: none"> <li>• % increased storage capacity</li> <li>• % increased HED network speeds</li> <li>• % improved performance on Shared Drive and eDEAR application</li> </ul>
<b>Accomplishments</b>	<ul style="list-style-type: none"> <li>• 85% increased storage capacity (added 16TB raw storage)</li> <li>• 10% increased overall HED network speed (due to new Juniper switches)</li> <li>• 15% improved average speed on Shared Drive and eDEAR application</li> </ul>

**TABLE III.1:** SFY 2018 strategic IT accomplishments

## ***B. OTHER SFY 2018 IT ACCOMPLISHMENTS***

<b>CATEGORY</b>	<b>ACCOMPLISHMENT</b>	<b>VALUE or IMPACT</b>
APPLICATIONS	Migrated eDEAR to Java/Docker framework	Identified ambiguous and unforced DEAR policies, simplified data upload, improved User Experience (UX) with new design
CUSTOMER SERVICE	Began proactive, fully transparent engagement with Higher Education Institutions (HEIs)	More collaboration and cooperation on data submittals, more discussion on data sharing and shared technology projects
DATA	Applied systematic QA on DEAR data analysis	More complete and consistent data
INFRASTRUCTURE	Replaced and upgraded server and network systems	Increased storage and improved network and service performance
MANAGEMENT	Began using <a href="#">kanban</a> style organization and improvement method	More efficient use of staff time and energy
PROCESS IMPROVEMENT	Began using agile development framework	A highly-flexible and disciplined approach that is consistently yielding application improvements, including better UX
SECURITY	Implemented a “zero trust” architecture	Successfully prevented the exfiltration of sensitive data and improved ability to defend against modern cyber threats
WORKFORCE	Hired an IT Director	A more structured, best-practice methodology was introduced and a customer-focused, business-driven approach was implemented

**TABLE III.2:** Other SFY 2018 IT accomplishments

## IV. SFY 2019-2021 IT STRATEGIC GOALS & STRATEGIES

<b>PRIMARY IT STRATEGIC GOAL</b>	Deliver Capabilities to Foster Collaboration and Knowledge Management
<b>AGENCY STRATEGIC GOAL</b>	More fully leverage collected institutional and student information
<b>SFY 2019 Strategies</b>	<ul style="list-style-type: none"> <li>• Engage DWS, PED and other institutions to share and better utilize key constituent data</li> <li>• Empower HED staff with analytics software and other tools to more deeply investigate and explore data, discern trends, and perform hypothesis testing</li> <li>• Make more information readily available to the HEIs and the public</li> </ul>
<b>Metric</b>	Increase in number of inter-agency and inter-institution projects; increase in the use of existing and new analytical software; new and more accurate analyses; new and/or improved secure, easy to use web services
<b>SFY 2020 Strategy</b>	Make inter-agency data sharing standard and transparent by way of secure, on-demand access technology
<b>Metric</b>	Successful implementation of APIs, federated services and/or RESTful web services; amount of agencies' data queried/read
<b>SFY 2021 Strategy</b>	Make complex analyses easily and readily accessible to management and staff
<b>Metric</b>	Implementation of wizard-driven, web-based reporting services; increased number of web-based custom and ad hoc reports

**TABLE IV.1:** SFY 2019 – 2021 IT strategic goals and strategies

## V. IT FISCAL AND BUDGET MANAGEMENT

### A. IT OPERATING BUDGET (C1)

Information Technology Base Operating Budget Informational Purposes Only					
<b>Agency Name:</b>	NM Higher Education Department			<b>Agency Code:</b>	950
<b>Appropriation Funding Type:</b>	Base Request Operational Support of IT. Check one of the options below: Flat Budget <input checked="" type="checkbox"/> or Expansion from previous year <input type="checkbox"/>				
Revenue IT Base Budget (dollars in thousands)					
	SFY17 Actual	SFY18 Actual	SFY19 OpBud	SFY20 Request	SFY21 Estimate
General Fund	477	573	741	632	640
Other State Funds	8	10	15	36	45
ISF/IAT	0	0	0	0	0
Federal Funds	6	10	10	20	20
<b>Total</b>	491	593	766	688	705
Expenditure Categories (dollars in thousands)					
Category or Account Description	SFY17 Actual	SFY18 Actual	SFY19 Op Bud	SFY20 Request	SFY21 Estimate
Personal Services & Employee Benefits	211	215	380	420	425
Contractual & Professional Services	n/a	26	54	79	155
IT Other Services	n/a	13	13	15	15
Other Financing Uses	n/a	0	0	0	0
<b>Total</b>	n/a	254	447	514	595
	Agency Cabinet Secretary/ Director (mandatory)		CIO or IT Lead (mandatory)	Budget Director (mandatory)	
<b>Name</b>	Barbara Damron		Bogi Malecki	Miranda Ntoko	
<b>Signature</b>					
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TABLE V.1: NM Higher Education Department C1

## ***B. CAPITAL IMPROVEMENT, SPECIAL AND SUPPLEMENTAL FUNDING (C2)***

### ***C2: Information Technology Data Processing - Computer Systems Enhancement Fund (CSEF)***

There are no plans for C2 funding requests at this time.

### ***C. REQUEST FOR REAUTHORIZATION OF GENERAL APPROPRIATIONS***

There are no plans for request for reauthorization of general appropriations.



## APPENDIX A – MAJOR APPLICATIONS

<b>NAME:</b>	BAS	CCND	eDEAR	FA Application	SharePoint
<b>FUNCTIONALITY:</b>	Bill Analysis System	Common Course Numbering Database	Data reporting system for all NM public post-secondary institutions	Financial Aid application system	Collaboration & document management
<b>(BUSINESS PROGRAM SUPPORTED)</b>	<i>(All programs)</i>	<i>(Policy)</i>	<i>(Research &amp; Planning)</i>	<i>(Financial Aid)</i>	<i>(All programs)</i>
<b>SOFTWARE</b>					
OS:	Windows	Linux	Linux	Windows	Windows
DBMS:	SQL Server	MySQL	n/a	SQL Server	SQL Server
Language:	.Net	Java	Java	.Net	.Net
<b>AGE:</b>	5 years	1 month	8 month	3 years	7 years
<b>SUPPORT MODEL:</b>	<a href="#"><u>Swarming</u></a>	<a href="#"><u>Swarming</u></a>	<a href="#"><u>Swarming</u></a>	<a href="#"><u>Swarming</u></a>	<a href="#"><u>Swarming</u></a>
<b>LIFE CYCLE STATUS:</b>	Maintenance	Development	Support	Maintenance	Maintenance

**TABLE A.1:** Major NMHED Software Applications

## APPENDIX B – CORE INFRASTRUCTURE (hardware)

TECHNOLOGY PLATFORM	PHYSICAL LOCATION	SUPPORTED APPLICATION(S)	AGENCY-OWNED INFRASTRUCTURE		
			QTY	BRAND & MODEL/VERSION	AGE (years)
x64 servers	2044 Galisteo	<a href="#">VMware vSphere</a>	2	HPE DL360	1
SAS storage	2044 Galisteo	<a href="#">VMware vSphere</a>	1	HPE MSA2050	1
Network switches	2044 Galisteo	All IP-based communications	4	Juniper EX4200	1
Firewall & Router	2044 Galisteo	DMZ, VPN, Internet and subnet IP traffic management	1	Palo Alto PA-500 & Cisco 2901	2

**TABLE B.1:** Core NMHED IT Infrastructure hardware

## APPENDIX C - ARCHITECTURE DIAGRAMS

There are no accurate diagrams available at this time.

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