GOALS	Objectives	Implementation Tactics	BRICS
GOAL1: Support a Highly Efficient and Effective Biomedical Research Data Infrastructure	Objective 1-1 Optimize Data Storage and Security	Leverage existing federal, academic, and commercial computer systems for data storage and analysis.	The BRICS informatics system can be deployed on dedicated hardware or on the Cloud.
		Adopt and adapt emerging and specialized technologies (see text box "Graphical Processing Units").	The Medical Image Processing, Analysis and Visualization (MIPAV) modeule can be used to analyze imaging data using GPUs when appropriate.
		Support technical and infrastructure needs for data security, authorization of use, and unique identifiers to index and locate data.	BRICS has passed Certification and Accreditation and is FISMA moderate compliant. The Global Unique Identification (GUID) module generates uniques IDs for subjects so that data can be indexed and located.
	Objective 1-2 Connect NIH Data Systems	Link the NIH Data Commons and existing, widely-used NIH databases/data repositories using NCBI as a coordinating hub.	BRICS connects to a number of NIH and or Federal systems (e.g. Clinical Trials.gov, Federal Reporter, PubMed)
		Ensure that new NIH data resources are connected to other NIH systems upon implementation.	BRICS connects to a number of NIH and or Federal systems (e.g. Clinical Trials.gov, Federal Reporter). Future plans include connecting to NIH CC BTRIS.
		When appropriate, develop connections to non-NIH data resources	As needed. For example connecting to the IU and Coriell biorepositries in support of PDBP.
GOAL 2: Promote Modernization of the Data-Resources Ecosystem	Objective 2-1 Modernize the Data Repository Ecosystem	Separate the support of databases and knowledgebases.	BRICS informatics system (more the just a database) that supports the collection, validation, query, and analysis that supports FAIR data principles
		Use appropriate and separate funding strategies, review criteria, and management for each repository type.	NA
		Dynamically measure data use, utility, and modification.	BRICS provides multiple tools to support the visualizations of data use+.
		Ensure privacy and security.	BRICS has passed Certification and Accreditation and is FISMA moderate compliant.The Global Unique Identification (GUID) module generates uniques IDs for subjects so that data can be indexed without submitting PII
		Create unified, efficient, and secure authorization of access to sensitive data.	BRICS has a workflow that allows data to remain private to a PI until policy indicates that changes state so that the data is shared. In addition, user access can be control so that they only the access required to fulfill the duties.
		Employ explicit evaluation, lifecycle, sustainability, and sunsetting expectations (where appropriate) for data resources.	NA
	Objective 2-2 Support the Storage and Sharing of Individual Datasets	Link datasets to publications via PubMed Central and NCBI.	BRICS connects to a number of NIH and or Federal systems (e.g. Clinical Trials.gov, Federal Reporter, PubMed)
		Longer-term: Expand NIH Data Commons to allow submission, open sharing, and indexing of individual, FAIR datasets.	BRICS informatics system fully supports FAIR data principles (see table on second tab)
	Objective 2-3 Leverage Ongoing Initiatives to Better Integrate Clinical and Observational Data into Biomedical Data Science	Create efficient linkages among NIH data resources that contain clinical and observational information	BRICS supports the aggregation and linkage of clinical/assessment data to imaging and genomics data.
		Develop and implement universal credentialing protocols and user-authorization systems to enforce a broad range of access and patient-consent policies across NIH data resources and platforms.	The BRICS system can be configured to support project policies.
		Promote use of the NIH Common Data Elements Repository.	The BRICS data dictionary completely supports the use of NIH's Common Data Elements (CDEs) from collection, validation, and quering of data.
GOAL 3: Support the Development and Dissemination of Advanced Data Management, Analytics, and Visualization Tools	Objective 3-1 Support Useful, Generalizable, and Accessible Tools and Workflows	Separate support for tool development from support for databases and knowledgebases.	NA
		Use appropriate funding mechanisms, scientific review, and management for tool development.	NA
		Establish programs to allow systems integrators/engineers from the private sector to refine and optimize prototype tools and algorithms developed in academia to make them efficient, costeffective, and widely useful for biomedical research.	Work in progress
		Employ a range of incentives to promote data-science and tool innovation including "code-athons," challenges, public-private partnerships, and other approaches.	NA
	Objective 3-2 Broaden Utility, Usability, and Accessibility of Specialized Tools	Adopt and adapt emerging and specialized methods, algorithms, tools, software, and workflows.	BRICS team is constantly updating algorithms, tools, software, and workflows based on user input
		Promote innovative contributions to biomedical data science from allied fields such as mathematics, statistics, computer science, engineering, and physics	The BRICS team works with a wide range of experts that provide insight and guidance to the improvement of BRICS functionality
		Promote development and adoption of better mobile-device and data-interface tools through APIs that integrate with certified health information technology to pull data and support data analysis.	Work in progress
		Support research to develop improved methods for clinical informaticists and other scientists to use certified electronic health records and other clinical data securely and ethically for medical research.	Presently BRICS systems do not collect EHR data. However, enhances can be developed to support the injustion of EHR data.
	Objective 3-3 Improve Discovery and Cataloging Resources	Promote community development and adoption of uniform standards for data indexing, citation, and modification-tracking (data provenance).	This is done at multipel levels: GUIDS, DOIs, CDEs, and MetaStudy. The BRICS MetaStudy module allows users to assign a DOI, upload data, derived data, analyzed data, software and other study objects. The DOI can be referenced in a publication. In addition, BRICS has implemented BD2K's DATS specification to support importing study metadata into the data discovery index (again in support of FAIR).
GOAL 4: Enhance Workforce Development for Biomedical Data Science	Objective 4-1 Enhance the NIH Data-Science Workforce	NA	

		NA	
	Objective 4-2 Expand the National Research Workforce	NA	
	Objective 4-3 Engage a Broader Community	NA	
GOAL 5: Enact Appropriate Policies to Promote Stewardship and Sustainability	Objective 5-1 Develop Policies for a FAIR Data Ecosyste	NA	
	Objective 5-2 Enhance Stewardship	NA	
This strategic plan is highly interconnected but rests upon five pillars, its Overarching Goals:	Support a Highly Efficient and Effective Biomedical Research Data Infrastructure		
	Promote Modernization of the Data-Resources Ecosystem		
	Support the Development and Dissemination of Advanced Data Management, Analytics, and Visualization Tools		
	Enhance Workforce Development for Biomedical Data Science		
	Enact Appropriate Policies to Promote Stewardship and Sustainability		