

1. Describe how knowledge management is at the core of solving the problems we face in the highly complex activity such as health care. 2. Explain how use of a Relational Database Management System [RDMS] to implement an electronic Knowledge Repository provides a means of implementing this knowledge management. 3. Discuss how an Associative Data Model [ADM] to structure the eKR provides a flexible means of classifying, investigating, and solving Diagnostic Errors.

SITUATION

SHUAHUN		DAIA IABLE DEFINITION
Reduction of error in a complex activity like health care requires a	TABLE	
clearly defined and well maintained core of knowledge that can be	REPOSITORY	Central table to which all other
easily disseminated. This can be achieved through knowledge	CLASSIFICATION	This allows flexible associative of
management. Although well-established in most areas of high risk	FILE NAME	Allows for entering file name for
	FILE LOCATION	Allows for entering file location
human endeavor, knowledge management is all but ignored in the	APPLICATION	Allows the association of repos
healthcare field. Yet it is the healthcare field that is most in need	JOURNAL	Allows for entering the journal
of this approach to reducing Diagnostic Error in Medicine .	PUBLISHER	Allows for entering the publishe
	AUTHOR	Allows for entering an author o
	ORGANIZATION/AGENCY	Academic Institutions, Societies
	PHONE AND ADDRESS	Central control over phone nun
PROBLEM	RELATION	ALAND ASSOCIATIVE DA
How can we leverage knowledge about Diagnostic Error to:	 R-Link: Classical Relational One- to-Many Link A-Link: New Technology; 	
	Associative Many-to-Many Link	Link by File Type A-Link FILE NAME A-Link REPOSITORY
RISK Maximize patient safety with correct and timely diagnoses,		R-Link A-Link A-Link
accurately communicated and acted upon		FILE LOCATION AUTHORS
QUALITYMinimize discomfort and the pain suffered due to wrong, delayed, or miscommunicated diagnoses		R-Link - Multiple R-Link PHONE/ADDRESS INSTITUTION
UTILITY Minimize expenditure of scarce resources through improved	NOTE: CLASSIFICATIONS CAN BE EITHER	
cost effective diagnostic processes	HIERARCHICAL OR NONHIERARCHICAL AND CAN LINK TO THE SAME KNOWLEDGE RESOURCES	IN THIS CASE AN HIERARCHICAL STRUCTURE HAS BEEN CHOSEN SEPARATE FORMS AS ILLUSTRATIO
	CLASSIFICATION MASTER PANEL	Image: State of the state o
	X Class # Class Class ClassAbbr	X Class Class ClassAbbr X Class # 10101 SYSTEM 1010401 1010401 1010401 10102 COMPONENT 1010402 1010402 1010403 10103 PROCESSES 1010403 1010403 1010403
SOLUTION		▶ 10104 SERVICE 1010404 1010405 ▶ 1010406 1010407
JOLUTION		FOUR SUB-CLASSIFICATIONS LINKED
The development of an electronic Knowledge Repository [eKR]	SINGLE SUB-CLASSIFICATION LINKED HIERARCHICALLY TO FMEA KNOWLEDGE MODEL	
based on Associative Data Model [ADM] is proposed as a	INSERT DELETE MARK MRKALL LEV DN LEV UP LEVELS GET TEXT HIER DN CLASS CLOSE STAUSLINE: KEY STROKE: KEY STROKE:	INSERT DELETE MARK MRKALL LEV UP LEV UP GET INSERT DELETE TEXT HIER DN CLASS CLOSE TEXT HIER STAUSLINE: KEY STROKE: KEY STROKE: STAUSLINE: STAUSLINE:
structure and methodology to classify all types of knowledge	Record: II → II	Record: I4 4 of 4 > H > T Unfiltered Search Record: I4 4 6 of 7
available regarding Diagnostic Error. This approach provides the	HindsightForesight.pdf - Adobe Reader Image: Comparison of the second	X Fill REPOSITORY PANEL: JUDGMENT X Title - Main
most effective means of flexibly creating, vetting, and	Invest of Experimental Australian: Hanness foregative and Polynomics with val i, No ↓ the-jup Hindsight ≠ Foresight: The Effect of Outcome Knowledge	Behavioral Decision Theory Processes of Judgment and Choice Hindsight <> Foresight The Effect of Outcome Knowledge on Judgmen Judgment Under Uncertainty Heuristics and Biases
disseminating knowledge. It can also be linked into the eHR .	on Judgment Under Uncertainty Baruch Fischhoff Hebrew University of Jerssolem, Israel One major ofference between bistorical and sombiasorical jedgement is that the bistorical jedge cyrically knows how things turned one. In Experiment I, receipt of such occounts insolved provide found to increase the postificted	Modeling application for cognitiv reliability and error ana The Psychology of Good Judgment LIST OF REFERENCES [RESQURCES] LINKED ASSOCIATIVELY TO
uissemmating knowledge. It can also be inked into the enk .	incidence of experted avents and charge the percenter of event- description dats, regardless of the liddhood of the outcome and the truth of the report. Judges were, however largely unavare of the effect that outcome knowledge had on their perceptions. As a result, they executi- mated what they would have known without contome knowledge (Experi- ment 2), as well as what other (Experiment 3) actually did larger- ment 2), as well as what other (Experiment 3) actually did larger without outcome knowledge. It is argued that this lack of avareness can seriously restrict out's ability to judge or term from the past.	Author(s) Fischhoff B Type ARTJ POID Type POID
The eKR will provide a central but widely distributed repository	Hindsight and foresight differ formully in Reporting an ouncome's occurrence increases the information available to the observer. It is precived probability of occurrence is and The hindsightful judge possesses outcome (b) people who have received outcome knowledge, that is, he knows how things turned out. The foresightful judge does changed their perceptions in the manner de- not. Although foresight usually implies scribed in the first hypothesis. In combina- looking at the future, in the absence of out:	Resource Text
not only for knowledge about the causes of diagnostic error but	come knowledge, past and future events can be equally inscrutable. The studies presented here ask two ques- tions about the judgmental differences be- tween hindsight and foresight: (a) How does receipt of outcome knowledge affect judgment? (b) How aware are people of the effects that outcome knowledge has on their (1969) notes:	INSERT DELETE MARK MRKALL FLTOFF CLRFLT ALL REC ACCTS JRNL PUBTYP OIT AUTH LINK UNLINK HIER DN STAUSLINE:
also a about solutions which can be validated and shared.	perceptions? Answers to these questions will shed light on how people do learn and might better learn from history. The two hypotheses explored are: (a) Preparation of this report was supported by the Advanced Research Projects Agency of the De- pertment of Defrme (ARPA Order 2449) and was membered by its Office of Nucl Research An apt name for this hypothesized tend-	Record: I4 2 of 5 > II IV FILE PANEL: Hindsight <> Foresight
	was manifered by the Office of Naval Research numer Construct No. NGON473-C-0138 (NR 10). 6005). The research reported consitutes port of a dectoral disortations assimilated on The Herbert University of Jerusalem. I am derey indebted to a dectoral disortations assimilated on The Herbert University of Jerusalem. I am derey indebted to Roth Beryt, and Sarah Lithermation for thrive car- tibulions to this project. The detailed comments of top manymeans reviewers on a previous defail are gratefully acknowledged. Requests for reporting should be sent to Barch.	X Drv Directory File Ext Siz I: \Work\DEM\DEM2016\References\UpLoad\ HindsightForesight pdf 947
IMPLEMENTATION	Well as historians. One example is Tversky 3195, Engene, Oregon 97803 WEB PAGES, CHARTS, IMAGES, AND AUDIOVISUAL	
	RESOURCES CAN BE SHOWN AS WELL	One or more Files Linked Associatively To the Hindsigh
Shown are screen shots of a model system written in Visual Basic	HINDSIGHT # FORESIGHT 289 numbers," the helief that data which were positive success of the result (including that observed more or less hait to be observed, A account example is the tendency to revork provide succession of the information appearing in the prostate	
for Access [VBA MS ACCESS] working over a fully Relational	or reconstruct the biographies of derivats to show that their present diagnoses (lobels) are inevitable products of their life histo- ries (Loßand, 1969; Rosenhan, 1973; Schur, 1971). A third is the defensive attribution of responsibility for accidents, a process in which would be accident to a process in	INSERT DELETE MARK MRKALL FLTOFF CLRFLT DIR IMP ALL IMP SEL SCAN IMP SCN LOAD LINK UNLINK HIER DN STAUSLINE:
Database Management System [RDMS] implementing an		Record: H 4 1 of 1 >> H >= K Unfiltered Search
Associative Database Structure [ADS]. This provides the means of		REFERENCES – SELEC
linking information hierarchically and nonhierarchically as well as		ution: or a History of the Future; Kodansha International 1991. Indge Management; Butterworth Hienemann; 2003.
linearly and nonlinearly. All this can be done without requiring	3. McElroy MW; The New Knowledge Manage	ement: Complexity, Learning, and Sustainable Innovation; Knowledge mation and Knowledge: A Compilation of Papers Prepared for the Elev
information to be duplicated when linked to more than one	Astronautics U.S. House of Representatives	
knowledge structure. Relationships established are independent	 6. Maier D; The Theory of Relational Databas 7. Widerhold G; Database Design; McGraw-H 	ses; Computer Science Press 1983.
of each other allowing multiple knowledge structures to co-exist.	8. O'Brian JA; Management Information Syste	ems: A Managerial End User Perspective; Irwin 1993.

REDUCING DIAGNOSTIC ERROR IN MEDICINE THROUGH THE POWER OF KNOWLEDGE MANAGEMENT © 2016 Mark Gusack, M.D. **MANX Enterprises, Ltd.**[®]

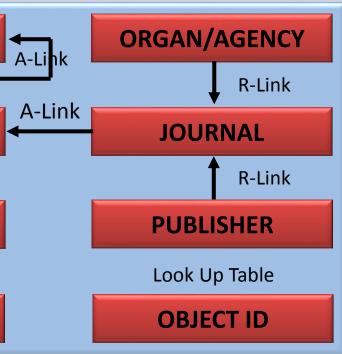
DATA TABLE DEFINITIONS [IN BRIEF]

nagement information systems: A Managerial End User Perspective; Irwin 1993. 9. Gusack MD; Integrated Quality Management and The Scientific Method; MBG Industries, Inc. 1997. 10.Gusack MD; Associative Database Model for Electronic – Based Informational Assemblies; USPTO Utility Patent 6,112,209B.

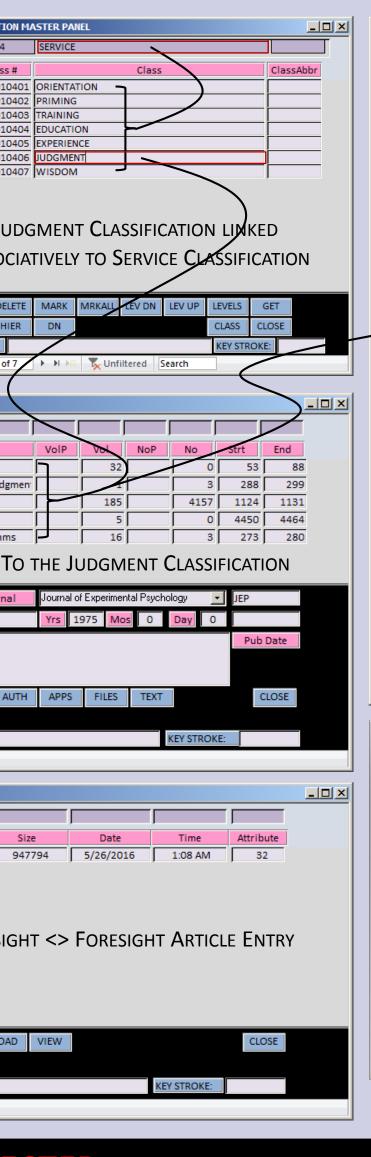
DESCRIPTION

- er data is associatively linked
- e classification structures to be defined
- for associative linking to the repository
- on for use in loading file in an application
- ository files with its display application
- I once and linking many
- her once and linking many
- once and using many
- es, federal agencies, and similar entities
- umbers and addresses for easy editing

RELATIONS [IN BRIEF]



EN AND THREE LEVELS DISPLAYED IN



NOTE: THIS LINEAR DISPLAY OF CLASSIFICATIONS SHOWS TWO SEPARATE KNOWLEDGE STRUCTURES: FMEA AND SYSCOG TAXONOMIES

== (CLASS	IFICATION	M/	ASTER PA	NEL						_ 🗆	×
		01				cl				21		F
	X	Class #	_	MODEL 1	· EMEA	Class				ClassAbl	or	
\square		1		CULTURE					—		-	
		101	01	SYSTEM								
			_		MANAGEN		OFMENT				_	
\vdash			_		TED SYSTE NAGEMEN		GEMENT		—		_	
\vdash			_		ANAGEM				— i		_	
		10101	02	INTEGRATED KNOWLEDGE MANAGEMENT								
			_	INTEGRATED DOCUMENT MANAGEMENT			_		_			
Н			_	COMPONENT PROCESSES			—¦		—			
			_	SERVICE								
			_	ORIENTATION								
\vdash			_	PRIMING			—¦		_			
\vdash			_		TRAINING EDUCATION							
		10104	05	EXPERIEN	EXPERIENCE							
4	-		_	JUDGME							_	
\vdash		10104	_	MODEL 2					—¦		-	
		2	01	SIGNALS								
			_	TYPE								
\vdash			_	MICROS	GIC SCAN	NERS			—¦		_	
\vdash			_		ORY INSTR	RUMENTS						
			_	i			TRUMENT	S				
\vdash			_	<u> </u>	ARY INSTR				—		_	
\vdash			_	DENSITY	VASCULAR INSTRUMENTS			—¦		-		
		201	03	COMPLEX	KITY							
\square			_	CLARITY							_	
\vdash			_	DURATIO				—¦		_		
			_	ORDER								
			_	MODULATION						L		
\vdash			_	RECEPTION PERCEPTION								
		2	05	FILTER PF	FILTER PRIMARY							
	INSE	RT DELET	ΓE	MARK	MRKALL	LEV DN	LEV UP	LEVELS	L	NK		
	TEX	T HIEF	R	DN				CLASS	CLO	OSE		
	STAU	SLINE:						KEY STR	ROKE	:		Ŧ
Re	cord: I	• • 18 of	45	▶ ₩	🖌 Unf	iltered	Search					
_												
	MARK MARK one or more records for linking, unlinking, moving, filtering, etc.											
L	.EVDN	LEVe	LEVel DowN an hierarchical or associatively organized knowledge structure									
L	EVUP	LEVel	LEVel UP an hierarchical or associatively organized knowledge structure									
	LINK	LINK	LINK or UNLINK one or more MARKed records to another record									
	HIER	HIER/	HIER/ASSOC/ALL – Define type of link and how knowledge is displayed									
	GET	GET H	GET HIERarchical/ASSOCiated records LINKed to the highlighted record									
	DN	Look	Look DowN or UP the hierarchical/associative knowledge structure									
F	ILTON	I FILte	FILter ON/OFF for filter criteria entered above the table headings									
1	MPSE	IMPo	IMPort SELected files from a file pick list into file table link to repository entry									
1	MPAL		ort A	LL files in	a folder in	ito file tal	ole link to r	epository	reco	rd		
Ē	SCAN	SCAN	l do	cuments t	o a predef	fined dire	ctory via so	anner sou	urce			
I	MPSCI		ort S	C a N ned d	ocuments	into file t	able link to	o reposito	ry red	cord		
F	LOAD	LOAT	LOAD highlighted file using associated application for viewing									

EXAMPLE PUSH BUTTON FUNCTIONALIT

LOAD LOAD highlighted file using associated application for viewing

VIEW Images within the application [JPG, PNG, TTF, JIG, etc.]

ge Management Consortium International 2003.

leventh Meeting of the Panel on Science and Technology; Committee on Science and *ystem*; Prentice Hall PTR 2000.

The cost of the associative model is strictly up front programming, computing power, and storage space all of which are inexpensive.

The benefits are many including but not limited to:

SCOPE OF THE PROJECT

The actual deployable **eKR** will be based upon a highly reliable first tier programming language such as C++/#/Net, or Delphi married to a first tier relational database such as Oracle, DBII, or MS SQL to store text, images, video, and audio including but not limited to:

- Journal articles
- Vendor publications
- Federal publications
- Private society publications
- Academic publications
- Internet sites
- Internet blog
- Email streams

- Taxonomy of diagnostic error

Development of an **eKR** based on an Associative Data Model [ADM] will provide the operational tool necessary to classify, investigate, and solve complex problems in healthcare including validating proposed solutions and disseminating them to:

REDUCE DIAGNOSTIC ERROR IN MEDICINE

	ACKNOWLEDGEME
William S. Yamamoto, M.D.	As mentor and ins
Barry W. Walcott, M.D.	As mentor and tea
Mark Graber, M.D.	For supporting me
aura Zwann, PhD	For allowing me to

RISK

CILLIZ

ONALIT

COST BENEFIT ANALYSIS

Multiple simultaneous, competing knowledge structures Sharing of resources between knowledge structures The modeling of very complex systems and processes The capacity to place conditions on associative links

Books/book chapters/pages/text blocks

Types of information to be stored includes but is not limited to:

Epidemiologic and statistical data on causes of diagnostic error Hypotheses and theories regarding cause of diagnostic error Proposed and validated solutions to reduce diagnostic error Structured documentation covering implemented solutions Evaluation of the above subject matter by SIDM membership

CONCLUSION

piration in medical informatics acher in medical systems ne during early development o present this crowded poster