Chapter 1 : Veeam Intelligent Data Management for the Hyper-Available Enterprise

This final report details the contract performance and analysis of research and development results obtained during the contract period. KT-TECH's research and development work results in the.

Collection guidance[edit] At the director level and within the collection organization depending on the intelligence service , collection guidance assigns collection to one or more source managers who may order reconnaissance missions, budget for agent recruitment or both. Research[edit] This may be an auction for resources, and there is joint UK-US research on applying more formal methods. One method is "semantic matchmaking" based on ontology , originally a field of philosophy but finding applications in intelligent searching. Researchers match missions to the capabilities of available resources, [1] defining ontology as "a set of logical axioms designed to account for the intended meaning of a vocabulary. Collection system managers are asked to specify the capabilities of their assets. The intelligence model compares "the specification of a mission against the specification of available assets, to assess the utility or fitness for purpose of available assets; based on these assessments, obtain a set of recommended assets for the mission: Through an understanding of all available platforms tied to questions related to the PIR the collection manager synchronizes available assets, theatre and corps collection, national capabilities and coalition resources such as the Torrejon Space Center to maximize capabilities. Alternative disciplines[edit] Despite the desirability of a given method, the information required may not be collectible due to interfering circumstances. If air defense is the limitation, planners might request support from a national-level IMINT satellite. If a satellite will do the job, the orbits of available satellites may not be suitable for the requirement. If weather is the issue, it might be necessary to substitute MASINT sensors which can penetrate the weather and get some of the information. SIGINT might be desired, but terrain masking and technical capabilities of available platforms might require a space-based or long-range sensor or exploring whether HUMINT assets might be able to provide information. The collection manager must take these effects into consideration and advise the commander on the situational awareness available for planning and execution. Other sources may take some time to collect the necessary information. Support resource management[edit] An available, appropriate collection platform does not mean it will be useful if the facilities needed to receive and process the information are unavailable. Two factors affect this process: Collection platforms able to collect tens of thousands of pieces of information per hour need receivers which can accept that volume. The collection capability, even with self-generating reports, can quickly overwhelm inexperienced or understaffed analysts. While the CM is primarily concerned with collection, they must also know if analysis for the requested system has the resources to reduce and analyze the sensor data within a useful length of time. Commanders and staff are accustomed to receiving quality imagery products and UAV feeds for planning and execution of their missions. In exercises, this is often done with high-speed fixed networks; in a mobile, fluid battle it would be nearly impossible to develop a network capable of carrying the same amount of information. The CM must decide if an analytic report rather than the imagery itself will answer the question; when a hard-copy image or video is required, the CM must inform staff members of the cost to the IT network and HQ bandwidth. Collection management is the cornerstone on which intelligence support to ARRC operations is built. After an initial phase where field personnel decided priorities, an interim period began in which requirements were considered "as desirable but were not thought to present any special problem. Perhaps the man in the field did, after all, need some guidance; if so, the expert in Washington had only to jot down a list of questions and all would be well. When that machinery was set up, specialized methodologies for requirement management needed to be developed. The methodologies first needed were those used against the Sino-Soviet bloc, and radical changes in the threat environment may make some of those methodologies inappropriate. Requirements may be cast in terms of analysis technique, collection method, subject matter, source type or priority. One cannot help feeling that too little of the best thinking of the community has gone into these central problemsâ€”into the development, in a word, of an adequate theory of requirements. Dealing with general matters has itself become a specialty. We lack a vigorous exchange of views between generalists and specialists, requirements officers and administrators, members of all agencies, analysts in all intelligence fields, practitioners of all collection methods, which might lead at least to a clarification of ideas and at best to a solution of some common problems. Administration and system for example, the top-level directive Intellectual discipline, using the analytical method Training and responsibilities of the individual intelligence officer " Each of the three kinds answers a deep-felt need, has a life of its own, and plays a role of its own in the total complex of intelligence guidance". Since Heffter focused on the problem of priorities, he concerned himself chiefly with policy directives, which set overall priorities. Within that policy, "requests are also very much in the picture since priorities must govern their fulfillment". Analysts publish lists of their needs in the hope that someone will satisfy them. Theorists and administrators want a closely knit system where all requirements can be fed into a single machine, integrated, ranged by priorities and allocated as directives to all parts of the collection apparatus. Collectors demand specific requests for information, keyed to their capabilities. These differing desires can cause friction or complement one another. The tendencies can complement each other if brought into balance, but their coexistence has often been marked with friction. The characteristics of a requirement are: Need Compulsion or command stated under authority Request with a specific intelligence meaning In intelligence, the meaning of "require" has been redefined. Under this interpretation, one person the "customer" makes a request or puts a question to another of equal status the collector who fulfills or answers it as best they can. There is an honor system on both sides: The requester vouches for the validity of the requirement. The collector is free to reject it. If he accepts it, the collector implies assurance that he will do his best to fulfill it. The relationship is free from compulsion. The use of direct requests appeals to collectors, who find that it provides them with more viable, collectible requirements than any other method. It sometimes appeals to requester-analysts, who if they find a receptive collector can get more requirements accepted than would be possible otherwise. The elements of need, compulsion and request are embodied in three types of collection requirements: Inventory of needs[edit] Intelligence watch centers and interdisciplinary groups, such as the Counterterrorism Center, can create and update requirements lists. Commercial customer relationship management CRM software or the more-powerful enterprise relationship management ERM systems might be adapted to managing the workflow separate from the most sensitive content. No collector is directed required to collect on the basis of these lists, and the lists are not addressed to any single collector. A simple business relationship, such as CRM and ERM; compare to a semantic web and mind maps , with related but different functions. Branch and station chiefs have refused to handle the Periodic Requirements List PRL because these are "not really requirements," i. Intelligence requirements in the PRL may be crafted to elicit information from a specific source, sidestepping a request process which could have ended in denial. Revised three times a year, they are the most up-to-date requirement statements and their main subject is current affairs of political significance. Although the inventory of needs is a valuable analytical instrument in the intelligence-production office which originates it, it cannot set priorities. Directives[edit] Although short, prioritized directives for collection missions have come from top-level inter-agency policy boards, directives more often come from lower managerial levels. They are most useful in the following circumstances: Where a command relationship exists Where there is only one customer, or one customer is more important than the others Where a single method of collection, with precise, limited, comprehensible capabilities, is involved Technical collection methods are the least ambiguous, with meaningful priorities and actual, scheduled resources. Agencies requiring HUMINT prepare lists of priorities which establish goals, provide a basis for planning and summarize the information needs of consumers. Requests[edit] Most requirements fall into this category, including the majority of those with requirement-tracking identifiers in a community-wide numbering system administered by a central group. Requests vary, from a twenty-word question to a fifty-page questionnaire and asking for one fact or a thousand related facts. Its essence is the relationship between requester and collector. A variant on the request is the solicited requirement, in which the request itself is requested by the collector. The collector informs the customer of their capability and asks for requirements tailored to it. The consumer and collector then negotiate a requirement and priority. In clandestine collection, solicited requirements are regularly used for legal travelers, for defectors and returnees, and for others whose capability or knowledge can be used only through detailed guidance or questioning. Administration[edit] A department or agency which collects intelligence primarily to satisfy its own requirements usually maintains an internal requirements system with its own terminology, categories and priorities, with a single requirements office to direct its collection on behalf of its consumers. One requirements office, or a separate branch of it, represents collector and consumer in dealing with other agencies. Where consumers depend on many collectors and collections serve consumers throughout the community, no such one-to-one system is possible and each major component collector or consumer has its own requirements office. Requirements offices are middlemen, with an understanding of the problems of those they represent and those whom they deal with on the outside. A consumer requirements officer must find the best collection bargain he can for his analyst client, and a collector requirements officer must find the best use for the resources he represents and protect them from unreasonable demands. Source sensitivity[edit] Intelligence taken from sensitive sources cannot be used without exposing the methods or persons providing it. A strength of the British penetration of the German Enigma cryptosystem was that no information learned from it or other systems was used for operations without a more plausible reason for the information leak that the Germans would believe. If the movement of a ship was learned through deciphered Enigma, a reconnaissance aircraft was sent into the same area and allowed to be seen by the Axis so the detection was attributed to the aircraft. When an adversary knows that a cryptosystem has been broken, they usually change systems immediately, cutting off a source of information and turning the break against the attacker, or they leave the system unchanged and use it to deliver disinformation. Early in the discussion, the public acknowledgement of satellite photography elicited concern that the "Soviet Union could be particularly disturbed by public recognition of this capability [satellite photography] A basic model is to separate the raw material into three parts: True source identity; very closely held Pseudonyms, code names or other identifiers All reports from the source Since the consumer will need some idea of source quality, it is not uncommon in the intelligence community to have several variants on the source identifier. At the highest level, the source might be described as "a person with access to the exact words of cabinet meetings". At the next level of sensitivity, a more general description could be "a source with good knowledge of the discussions in cabinet meetings". Going down another level the description gets even broader, as "a generally reliable source familiar with thinking in high levels of the government". Collection department ratings[edit] In U. Raw reports are typically given a two-part rating by the collection department, which also removes all precise source identification before sending the report to the analysts.

Chapter 2 : Intelligent Data Management Supports Better Data Access - DATAVERSITY

Introduction The number of images including remote sensing data, mammograms, CAT scans, NMR's, fingerprints, commercial radar, etc., generated daily in both the public and the private sector is.

Typically, decision support systems help decision-makers to gather and interpret information and build a foundation for decision-making. Such systems may range from simple software systems to complex knowledge-based and artificial intelligence systems. Decision support systems can be database-oriented, spreadsheet-oriented or text-oriented in nature. In healthcare, clinical decision support systems CDSS can play a significant role. Clinical decisions that are routinely taken by healthcare service providers are often based on clinical guidance and evidence-based rules derived from medical science. IDSS can be applied in healthcare in diverse areas such as the examination of real-time data from diverse monitoring devices, analyses of patient and family history for the purpose of diagnosis, reviews of common characteristics and trends in medical record databases and many more areas [1]. This article demonstrates how a hybrid architecture combining the concepts of data mining DM and artificial neural networks ANN can be applied to patient data for intelligent decision support in healthcare [2][3]. An IDSS in healthcare gathers and incorporates healthcare-specific domain knowledge and performs intelligent actions, including learning and reasoning while recommending clinical steps to take and justifying the outcomes [2][3]. Understanding Intelligent Decision Support: Some Definitions To comprehend intelligent clinical decision support, it is important to define some relevant terms and related decisions. Computer applications that support and assist clinicians in improved decision-making by providing evidence-based knowledge with respect to patient data. This type of computer-based system consists of three components: Intelligent decision support is provided by a system that helps in decision-making through a display of intelligent behavior that may include learning and reasoning. Such learning and reasoning can be achieved through implementing rule-based expert systems, knowledge-based systems or neural network systems [2]. AI refers to the art of empowering computers with intelligence similar to that of humans. This is achieved by combining hardware and software systems so they can perform tasks that are rule-based and require decision-making [3]. A mathematical model that simulates the structure and functional aspects of biological neural networks. It mimics in a simplified way how the human brain processes information. ANNs have the ability to identify meaning from complicated data and to extract patterns and trends that are too complex to be noticed by either humans or other computer-based techniques. Differences Between IDSS and DSS An IDSS induces specific domain knowledge from raw data by identifying and extracting strategically useful information patterns from this data, thus making the extracted patterns understandable and usable for decision-making. IDSS, in addition to giving recommendations, may also contribute estimates of the level of confidence in the recommendations it gives. IDSS can handle complex problems, applying domain-specific expertise to assess the consequences of executing its recommendations. Decisions supported by IDSS also tend to be more consistent, timely and better managed in terms of managing uncertainty in the outcomes. The justification of outcomes provided by an IDSS is particularly significant if it allows clinical experts to validate the explanations provided by the IDSS [1]. Managing knowledge in healthcare organizations to aid clinical decision-making requires transforming information into actionable intelligence that can be interpreted by different functional workgroups within the organization. This is demonstrated in Figure 1, a representation of the healthcare knowledge cycle from Patel et al [4], which shows how artificial intelligence can be used to analyze healthcare data and generate a representation of knowledge that can in turn be used for information and process modeling. The knowledge cycle implemented with AI methods and tools adapted from [4]. Intelligent decision support systems can help in multiple ways in clinical decision-making at both the individual patient level and the population level. Diagnose by regularly interpreting and monitoring patient data. An IDSS can implement rules and patterns for individual patients, based on clinical parameters, and raise warning flags when such rules are violated. These flags can lead to clinical interventions that save lives. Help chronic disease management through establishing benchmarks and alerts. For chronically ill patients, a deviation noticed by an IDSS in, say, a blood test reading from a diabetic patient could result in an intervention before the patient gets into difficulty. Help public health surveillance by detecting pandemic diseases or in surveillance of chronic diseases. In case of a pandemic, an IDSS can interpret data and predict possible future spread of the disease. Additionally, IDSS can perform regular clinical decision support functions like preventing drug-drug interactions. Case Study In order to understand the efficacy of IDSS in clinical setting, consider the case of Jane Doe, a year-old female diabetic patient who takes Metformin, Lipitor and aspirin. She has been consulting with Dr. Smith, a family physician, for the last eight years. Her PHR system is integrated with Dr. Over time, monitored data can generate significant sets of data that can be used, in conjunction with medical care guidelines, for the care of patients with specific chronic diseases. The data can be mined continuously to derive and update intelligent decision rules that are focused on specific patients and that can adapt over time to patient status [3]. On a given day, Dr. Normally in such a situation, Dr. Smith would prescribe medium intensity Warfarin oral anti-coagulation therapy. But Jane, who is also taking aspirin, runs the risk of developing an increased risk of uncontrolled bleeding if she takes Warfarin concurrently with aspirin [3]. At this point, if Dr. The IDSS creates a patient profile over time through the process of machine learning, using previous data collected from the patient, and triggers an alert as soon as one or more values within the profile get out of range. IDSS intervention in patient specific scenario. The IDSS also detects that the combined prescribed dosage of both aspirin and Warfarin enhances the risk of bleeding and signals an alert of a drug-to-drug reaction, including a recommendation of a corrective dose of mg aspirin per day and also to monitor the international normalized ratio INR for Warfarin treatment [3]. An INR is a laboratory test that measures the time for blood to clot and then compares it with an average time. A higher INR indicates a longer time for blood to clot, thereby preventing formation of clots that may cause stroke. INR is a useful test to monitor the impact of anticoagulant medicines such as Warfarin. If INR is too high then uncontrolled bleeding may occur [5]. Note that if Dr. Smith were using an EMR with an installed DSS, a drug-drug interaction alert would have triggered but not a heart rate or blood pressure alert, which is based on patient profiling and pattern recognition. Potentially clinically significant drug-drug interactions [3]. The system is capable of building domain knowledge from existing datasets and applying this knowledge to solve clinical problems. As data mining extracts domain-specific knowledge from organizational databases, it also enhances the process of knowledge acquisition. Neural networks can learn patterns from large volumes of data and use the knowledge thus extracted to help solve problems [2]. The solution discussed here has been adapted from a similar architecture presented by Viademonte et al. In the context of the primary healthcare system, the system creates and tracks patient profiles and then uses the patterns it recognizes from the data to identify unusual test readings and trigger alerts for possible intervention. It can also assist in diagnosing certain diseases based on a set of observed symptoms and suggest recommendations. It is basically a hybrid system for applying descriptive and predictive models for intelligent decision-making [2][3]. This system allows raw data to be retrieved from data bases and processed into data models. These data models support descriptive methods that are stored in knowledge bases. Subsequently, predictive methods based on neural network models are generated that produce predictions [2]. The IDSS architecture under discussion can operate either through data mining for knowledge acquisition or through a neural network-based system operating as an advisory system. While the data mining technology offers expertise, the ANN-based system acquires knowledge through learning and reasoning as well at the intuitive user interface level [2]. At the data level, the system depends on a master data warehouse that combines relevant data repositories, case bases and knowledge bases. The elements of the architecture include [2]: As neural networks are applied to these descriptive models, predictive models are generated. Domain specific cases or case bases and their corresponding data models are created by extracting data from the data warehouse. The process ensures data consistency within that domain [3]. Once data mining has been successfully employed to extract relevant relationships from the case bases, association rules are applied to produce general knowledge that is stored in the knowledge base. In the medical field, specific clinical cases or practice guidelines can be used as case bases from which data can be mined to produce clinical knowledge for generating descriptive clinical features or for decision support functions [2][3]. The dashed lines in Figure 2 symbolize processes and the solid lines with arrowheads symbolize data flows between components. The data warehouse consists of pre-processed historical data that are mined. Subsequently, cases are selected, extracted and stored in case bases [2]. Conclusion The IDSS model described in this article is capable of learning, generalizing and self-organizing in order to recognize complex patterns and assist in decision support [2]. The case study of Jane, the year-old diabetic patient, indicates that when self-monitoring data and test data at each patient visit are available to a physician using an EMR with IDSS support, the physician would be able to make better decisions. In the future, uploading self-management monitoring data automatically from patient personal health records to family physician electronic medical records may become the norm for chronically ill patients, and the intelligent decision support system discussed here would be able to play an important role in providing improved patient care. In future research, integrating interactions between different components will be implemented through a manager component for coordinating neural network functions and data mining. Continuous learning of the neural network can also be implemented and knowledge inter-operability among different systems can be expanded through the application of standard XML terminology [2]. Basu has more than 15 years of experience providing business and technology solutions to corporations in India, the United States and Canada. Based in Toronto, Canada, her current focus is in health informatics. Her areas of interest and expertise include medication management using health information technology, secure and private communication of patient data and application of data mining and artificial intelligence in clinical decision support. He is active in the study of organizational problems relating to the implementation of eBusiness approaches in health, business and government organizations. Mukherjee has spent more than 20 years providing business and technology solutions to Fortune Companies including Lehman Brothers, Philip Morris, Priceline. His current focus is in healthcare where he conducts research on advanced adoption of technology in healthcare and provides business solution to healthcare service providers and pharmaceutical companies across North America. International normalized ratio INR. What humanity optimized by artificial intelligence might look like: Like most professors, I did a lot of analytics in graduate school, and even had a real job as head of statistical computing at Harvard for a while. Then I lost interest for 20 years outside of an occasional correlation or regressionâ€¦ Tags: Predicting patient experience with narrative data: How to avoid chaos in the field by combining simulation and real-time optimization. Path to an intelligent enterprise By Joseph Byrum Imagine a future guided by artificial intelligence: Augmenting human decision-making at the enterprise level to generateâ€¦ Tags:

Chapter 3 : Intelligence collection management - Wikipedia

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Traditionally, that information has been termed "market intelligence. Sources of raw data for that analysis include sales logs, surveys and social media, among many others. In general, business intelligence refers to a broader information set about customers and product lines, such as how many products were shipped, the total number of sales in a month and other transactions occurring within a business. In contrast, market intelligence focuses on specific classes of customers, including demographic and geographic information and what they buy, all of which can help inform an analysis of business intelligence. Market intelligence also takes into account what is happening with the competition, which business intelligence ignores altogether. Goals and process Successful market intelligence answers concrete questions about current and potential customers and competitors, and helps the company determine internal goals. Questions that market intelligence can address include: Where should the company devote more resources? Which markets should it try to infiltrate next? Are there patterns to what our best customers buy? What products could be cross-marketed to existing customers? Into what demographic segments can the company push new and existing products? While there is no set plan for how companies should gather market intelligence, many do so by performing various forms of high-level analysis. Sankaran says Internet research, insights from sales and delivery teams, industry associations, and government bodies are also potential sources of good information. Sankaran noted that this can be a useful approach, especially if customer lists are maintained effectively. Dobney also recommended using information to which you already have easy access: What is their next step after arriving? How many get through to the basket? How many check out? Looking for patterns and then testing different content, taglines, signposts and offers uses market intelligence to improve the offer. Once this information is processed, businesses can use it to make important decisions, including determining market opportunity and creating market development metrics. Market intelligence tools Keeping track of all the information included in market intelligence can quickly become time-consuming for small companies. Many online tools exist to help you gather, analyze and store your market intelligence. Popular software options for companies in need of a business intelligence system include Pentaho and Sisense. Alternatively, cloud services such as Oracle and Birst can help you easily share business intelligence among units. While an individual can handle much of the work of market research for a small company, as your company grows you may face new challenges devoting sufficient time to intelligence. As the amount of data gets larger, it may become necessary to use statistical tools and more complex technologies to handle and manipulate the data, Dobney said. If you are not prepared to learn a software package or hire an in-house analyst, a third-party specialist may be able to help you make the most of your market intelligence.

Chapter 4 : Dynamics AX Intelligent Data Management Framework (IDMF) | Microsoft Docs

This final report details the contract performance and analysis of research and development results obtained during the contract period. KT-TECH's research and development work results in the areas of registration of remotely sensed data and the test evaluation and porting of the Regional Validation.

Chapter 5 : Research to Support Intelligent Data Management - CORE

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Chapter 6 : Intelligent decision support in healthcare | Analytics Magazine

KT-TECH's research and development work results in the areas of registration of remotely sensed data and the test evaluation and porting of the Regional Validation Center software system, are presented.

Chapter 7 : Veeam Intelligent Data Management for Hyper-Availability

Intelligent Data Management Supports Better Data Access. By Jennifer Zaino / October 4, / No Comments. Data access is a right, not a privilege. That philosophy.

Chapter 8 : Research Data Management Support | Drexel University

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