The primary goal of this grant proposal is to increase the adoption and use of interoperable health IT tools and services to support the exchange of health information within the state of Nebraska and with neighboring states. We aim to accomplish this goal by three primary activities: 1) increasing adoption by bringing new facilities on board the exchange with a specific focus on critical access hospitals/rural hospitals and long-term care facilities; 2) providing additional value-added functionality for existing participants; and 3) implementing information exchange with neighboring states via the HIE to HIE Gateway. For intra-state exchange, we will target facilities by specific regions to provide the most value. We have selected the Northwest Region centered in Scottsbluff, Nebraska; the East-central Region centered in Fremont, Nebraska; and the East region centered in Omaha.

1) Increasing adoption.
    a. New data sharing participants for the HIE **(Project B)** - The Nebraska Health Information Initiative (NeHII) currently has 26 critical access hospitals (CAHs) participating or preparing to participate in the HIE in Nebraska and Western Iowa. We propose adding 7 more CAHs in Nebraska, two specialty hospitals, two long- term care hospitals and five long-term care (skilled nursing) facilities.
    b. New data sharing participants via C-CDA exchange **(Project D)** - Facilities can provide data to the exchange by providing C-CDA documents. NeHII will accept, parse, and integrate the information into the exchange. We propose adding 20 different providers who do not currently participate in the HIE over the two year period covered by the grant. We will target additional CAH facilities, non-participating acute hospitals, and physician provider networks affiliated with these hospitals.
    c. New Direct secure messaging participants **(Project C)** – Facilities that do not have EHR software can still receive C-CDA documents via Direct secure messaging. We will target long-term care/skilled nursing facilities in the targeted regions to provide this service. We propose adding 50 additional facilities during the two year grant period.
2) Provide existing participants with additional services to increase the use of NeHII.
    a. Work flow analysis for new and existing participants to incorporate HIE and C-CDA data into daily processes **(Project B)**.
    b. Population health data analytics for participants electing to add the Optum One services to their NeHII functionality suite. Target Nemaha County Hospital and the Nebraska Medical Center as pilot participants **(Project A).**
    c. Syndromic surveillance functionality for data submission directly to the Nebraska DHHS reporting system **(Project B).**
    d. Provider directory for Direct participants to foster data sharing **(Project C).**
    e. Pain contract information displayed in the NeHII VHR **(Project F).**
3) Implement HIE-to-HIE Gateway
    a. Enable interstate information exchange with Kansas, Iowa, South Dakota, Missouri, and Colorado **(Project E).**

Project A: Optum One Analytics

The Optum One Analytics project will provide clinical data analysis tools for health information exchange participants. The software package provides reporting capabilities for population health, quality metrics, and risk measurement. The clean, validated data available through the platform can be used to make more accurate predictions of population health needs by focusing on the patients who have the most potential for

clinical improvement and cost savings. The tool can be used to help healthcare providers be pro-active rather than reactive with patient care.

NeHII will provide access to the software via the health information exchange. Participating facilities will be able to send data to the analytics platform for inclusion in the population health metrics. These facilities will be able to develop unique reports for data from their facilities to use for reporting measures and quality evaluations. They will also be able to compare their information to similar de-identified aggregate data from around the country. NeHII will need to set up data feeds from the participating facilities to receive data for use in the analytics software and will set up feeds to transmit developed reports back to the provider. NeHII will work with the participant to design scripts to determine the appropriate data for inclusion in the desired reports. We will bring on a pilot facility (Nebraska Medicine) and four additional facilities with the funding from this grant.

Project B: Critical Access Hospital, Specialty Hospital, and Long Term Care Facility Implementation with Syndromic Surveillance

Provider participation in health information exchange is critical to care coordination and other improvements to the quality of health care provided and to controlling rapidly increasing costs. Participating facilities are able to increase efficiency and decision-making by providing more complete patient information at the point of care. Every additional facility that participates in the HIE provides more data for a wider patient group and thus increases the value of the exchange for all other participants. Participation enables a more streamlined physician referral processes and care transition and can enhance relationships between patients and families by improving communications and the sharing of data.

NeHII will use the grant funding from the adoption milestone to a) increase participation in the exchange across the care continuum in areas of the state of Nebraska where hospital participation is already high and b) increase participation in regions of the state where the hospital adoption rate is low. In the high adoption areas, we will strive to fill in the gaps in missing information to provide a more complete patient data package. We are proposing adding two long-term care hospital facilities in the Omaha area and five skilled nursing facilities to increase participation across all care settings. We will also use the funding to bring on critical access hospitals and supporting skilled nursing facilities clustered around participating acute care centers in regions of Nebraska where participation is not as great.

In addition to providing monies to cover the initial set up and implementation fees, we have also proposed significant labor resource hour funding to provide care setting-specific work flow analysis and in-depth training by qualified, experienced health care professionals with significant information technology incorporation experience. We want the adoption of health information exchange to strengthen the provider-patient and the hospital-community relationships rather than frustrate and inconvenience the providers and hospitals.

We recognize that current HIE participants may not have recognized the utility of data from the exchange and have not fully implemented the use of the exchange into their regular clinical work flows. We have also proposed additional funding to support the review of existing work flows and analysis to provide additional ways to gain value from the exchange data. This resource time will also provide training hours to help solidify the use of the exchange in the daily routine for providing care.

We will also use grant funding to provide facilities with the technology required to submit data electronically to the Nebraska Department of Health and Human Services syndromic surveillance program (Syndromic Surveillance Event Detection of Nebraska (SSEDON)).

Project C: Direct Provider Directory and Implementation of Additional Facilities

Full data sharing participation in the health information exchange is not practical for all care facilities. Those smaller, specialized providers may not have the information technology infrastructure to send and receive data directly with the exchange platform. However, these facilities are able to participate in entry-level, value-added health information exchange via Direct secure messaging services offered through the Nebraska Health Information Initiative. Direct enables a healthcare provider with the ability to electronically and securely push specific health information, such as discharge summaries, clinical summaries from primary care providers (PCP) and specialists, lab results to ordering providers, or referrals over the internet to another healthcare provider(s) who is a known and trusted recipient. Direct supports simple scenarios of pushing data from where it is to where it is needed, in a way that will support more sophisticated interoperability in the future. NeHII will use the grant funding from the adoption milestone to add 50 additional Direct messaging participants. We will focus on bringing on skilled nursing facilities clustered around participating acute care centers and critical access hospitals in the target regions of Nebraska.

Direct allows for the transmission of health information in a uni-directional flow using a secure, standard, scalable encrypted format and ensures that the information goes to the correct provider, organization or patient. It augments previous inadequate, outdated and more expensive forms of sharing information such as fax or delivery of paper charts. Direct participants may send health data to any other individual or organization that is also a Direct participant outside of a formal HIE (Health Information Exchange) or other private network. Direct Addresses are available from HISPs (Health Information Service Providers), and are verifiable and "unspoofable". Direct is an initiative created by the ONC and is well-supported and Internet-friendly. This solution can facilitate a fast, cost-effective alternative for exchange of patient health information and can enhance transitions of care with direct communication to receiving providers. Direct also provides the ability to track successful delivery of messages. Direct will support the ability of participants to meet key Stage 2 Meaningful Use requirements by providing an approved transport mechanism for 1) electronically sending Transitions of Care summary care records and 2) providing patients with the ability to view, download and transmit their visit information.

Direct can be used in two different ways: 1) electronically sending messages to one another by attaching and exchanging health information documentation through secure email over an Internet connection or 2) integrating Direct messaging with the provider's EHR system to streamline the workflow process of sending/receiving summaries of care from within the EHR.

Project D: HIE to HIE Gateway

Although the Nebraska Health Information Exchange's primary goal is to serve the data exchange needs within the state, no state operates in a healthcare silo. Many patients cross state lines for specialized care or during vacation and travel. Nebraska shares borders with Iowa, South Dakota, Colorado, Wyoming, Missouri, and Kansas. Many Iowa hospitals participate directly in the Nebraska Health Information Exchange due to their geographic proximity to Omaha, Nebraska's largest city and a major health care hub. However, many patients in Iowa obtain care from hospitals around the state. The HIE to HIE gateway project will provide the

means for NeHII participants to query and retrieve patient data from other HIE entities without requiring the individual hospitals to direct connect to the Nebraska exchange. Through the Cross-Community Access (XCA) profile, participants can access relevant medical data held by other HIEs. We propose using funding from the exchange milestone to cover the initial implementation costs of connecting to the state HIE in Iowa (IHIN), the state HIE in Colorado (CORHIO), the state HIE in Kansas (KHIN), the state HIE in Missouri (Missouri Health Connection), and the state HIE in South Dakota (South Dakota Health Link).

Project E: C-CDA Exchange (XDS Repository)

When providing value-added services, NeHII recognizes that a "one-size fits all" approach does not always work. While many participants elect to use HL7 data feeds as the primary method for providing data to the exchange, providers can also submit care documentation in another standard format for incorporation into the patient's health record within the exchange. Whether seeing a patient for the first time or checking up on a patient recently discharged from the hospital, a provider will make better treatment decision when he or she has a summary of the care administered to the patient by other providers.

NeHII offers Cross-Enterprise Document Sharing (XDS) capabilities that facilitate clinical document sharing among various systems in the HIE. Participants can provide documents to the HIE's XDS Repositories and register documents with the HIE's XDS Registry. Users can query the HIE's XDS Registry for documents for a patient and retrieve documents from the appropriate repositories. When a user queries for data, the HIE will return the list of documents matching the query parameter, along with their metadata, as sent by the document source. The search matching is based on the metadata provided by the data source. Furthermore, the displayed metadata help end users to determine which documents are of interest. This functionality is different from the exchange of data through Direct as the information is stored and can be queried at any point in the future. We propose using funding from the exchange milestone to cover the initial implementation costs of connecting 20 new facilities with C-CDA exchange capabilities. We will target facilities (acute care hospitals, CAHs, and physician clinics) who elect to participate in this type of data sharing in the previously-identified regions of Nebraska.

Project F: Pain Contracts

Managing chronic pain with opioids is complicated and challenging. Doctors need to know if patients can follow the treatment plan, if they get desired responses from the meds, and if there are signs of developing addiction. Physicians use "pain contracts" to monitor patients adherence or to help check that patients are compliant with the medications ordered. Such agreements are most commonly used when narcotic pain relievers are prescribed due to the potential for addiction if not taken as prescribed by a doctor. The contract will spell out the rules patients must follow to take these drugs safely. The contracts aim to discourage people from taking too much medication, mixing medications, or sharing or selling them. The agreements may require patients to submit to blood or urine drug tests, fill their prescriptions at a single pharmacy or refuse to accept pain medication from any other doctor. If patients don't follow the rules, the agreements often state that doctors may drop them from their practice.

The use of a pain management agreement allows for the documentation of understanding between a doctor and patient. Such documentation, when used as a means of facilitating care, can improve communication amongst all of the patient's care providers. We propose using funding from the interoperability milestone to

cover the initial implementation costs of receiving and displaying pain contract information from one pilot site facility in the virtual health record.