GERMAN-CANADIAN CENTRE FOR INNOVATION AND RESEARCH
4213 Enterprise Square
10230 Jasper Avenue, Edmonton, Alberta T5J 4P6
Tel: 780-492-4287

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Company profile
Project Proposal - Ideas Draft

Technology North (TN) Corporation is an Alberta-Canada based Information Technology company, formed by top IT professionals in 1998. TN is focused on guiding businesses to success through the use of technology. In addition to the product offering, it provides IT consulting, software development and security services to organizations that need high quality solutions to support their business activities. The TN team has a wide range of business-oriented IT planning, project management and technical skills, allowing it to service virtually any client requirement. Technology North's flagship product is TN ActiveCare, a SaaS application product offering serving the human service and disability service field. It is an enterprise level application offering comprehensive functionality including; case management, care planning, care execution and evidence based care results data collection and reporting functionality.

TN ActiveCare is based on Microsoft .Net 4 framework technologies and iOS native technologies, including JSON web service, MS SQL engine, IIS, C#, JavaScript, backbone.js framework, underscore.js, HTML5/CSS3, iOS Objective C, SSRS for reporting and SSIS for data integration, Active Directory SSO, etc.

R&D Project ideas
The ideas presented in this document are a result of a series of brainstorming sessions between Technology North and its clientele, aim is to address the universal challenges face mobile development and deployment.

1. **A cross-platform data synch-kit for data upstream or downstream in unreliable communication environments**

   ### Issue description
   Many mobile applications require a consistent user experience and functionality regardless of connectivity, similar to the one offered by most email applications. However, due to the nature of mobile applications and geographical limitations, devices are often unable to connect to the backend servers at time of utilization. A cross-platform synch solution is required to support the data flows between different interfaces of a software product, including mobile and web backend applications.

Currently available solutions.
Very little knowledge is publicly available and no reliable SDK is known in this space. For example, the Apple Xcode SDK[1] does not have an extensive reference to support offline application capability.

A simple email application can be used as a counter example to the current software developments of the project partners. It is short and completely content-based, i.e. once an individual email is received by the device, and it will be available to the user regardless whether the device is online or offline. However, in many applications like sophisticated online games and business solutions, the data has many relationships and the application cannot function properly without up-to-date reference data. The goal is to provide these applications with a reliable offline and online functionality similar to the one of an email app.

Past R&D and experimental practice include local database cache capability, however due to inconsistent connectivity and large amount of data required for transfer between the backend and the device, it often leads to device crashes, resulting in data loss or corruption.

Project R&D idea
A mobile cloud synch-kit and related data center synch-kit to be used with a mobile device. The idea is to address the common issues with mobile devices such as secure data storage on mobile device, synch technologies in different connectivity condition, tracking changes. The new synch-kit would be able to handle mobile local store sensitive data, synchronize it with the backend server and stream large files such as videos to the input/output device.

2. **Complex-Web and Mobile Chart Engine for extreme healthcare application.**

Issue description
The common chart engine available for web and mobile device, are commonly address financial data and simple two axis data charting, such as stock market or simple healthcare usage, i.e., running distance by date. These simple chart engine do not support the more complex needs of healthcare and behavior analysis markets that require charts to include additional contextual information such as:

- Events (e.g. client events, intervention events).
- Treatment phases (e.g. Baseline, Teaching, and Maintenance).
- Treatment target levels (e.g. Gesture, Modelling, and Independence).
- Treatment progression and regression tolerance lines.
- Indicators of relative difference between X-Axis data.
- Gaps on the X-Axis where there is no data.
- Single line series with multi-segments.
- Overlays of line series that use difference formulas for the data points.
- Data aggregation and scaling by week, month, year while maintaining above indicator
- Pointer-over with custom data pop-ups
- Complex legend that includes information above

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[1] https://developer.apple.com/xcode/

No existing component from market place can handle above requirement, a research and development effort is required to address partial or all above requirement.

Currently available solutions
None

R&D Project idea
The proposed project is a research and development effort to address the needs to have a complex chart engine. Such engine can be standalone component which is sellable to other development for web and mobile devices development.

3. **Wearable mobile device for healthcare application**

Issue description
Today's healthcare worker often uses pager as the common on-call device due to its durability, reliability and traceability for secure healthcare messaging application. Attempt has been tried to use mobile device as iPhone or other PDA to replace pager, however many attempts have failed due to many reasons:

- Mobile device often store in pocket or left on desk while healthcare provider are not able to be noticed timely when messaging arrives.
- Unsecure message traveling through chat application.
- Not able to trace messaging delivering and signed read-notice.

Other challenges included in mobile device in healthcare:

- Not applicable with large mobile device during healthcare operation or patient visit/meeting.
- Not practical for snapshot data collection on the go.

On the client care side, current there is no solution for real time client motion monitoring for mental healthcare space, real time motion detection and just in time feedback treatment or intervention can prevent motion or mental health escalation or outbreak, provide better data collection that lead to better data analysis and treatment.

Currently available solutions
None of aware, very little information is available, or much cost solution is required.

Project R&D idea
Based on Apple iWatch technology, the proposed R&D idea could address there area of concerns:

A. Secure messaging deliver, notification and traceability
B. Mobile data collection utilize wearable technology
C. Wearable technology as motion sensor to real time client/patient monitoring, data feedback and just in time treatment/intervention