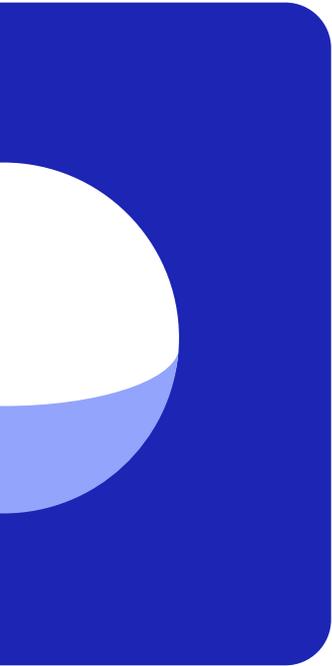
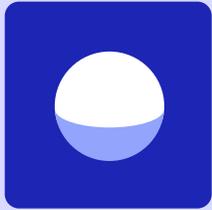




Long-term care
modernization
project



Neptune



Neptune, the most distant planet, huge and turbulent; often forgotten, often left out of the discussion.

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Hello!

We have a few ideas that you might find interesting.

Jay Machalani

UX/UI Architect (User Experience)

Medical Assistant in the Canadian Armed Forces

Between designing Windows 10 and iOS 14 widgets and having more than 5 years of experience leading a research project on the future of education, it is in Jay's nature to observe and seek ways to improve. Deployed with the army during Operation LASER, he witnessed and fought the crisis in the CHSLDs (LTCH) of Quebec in the midst of a pandemic for more than a month and a half.

Machalani

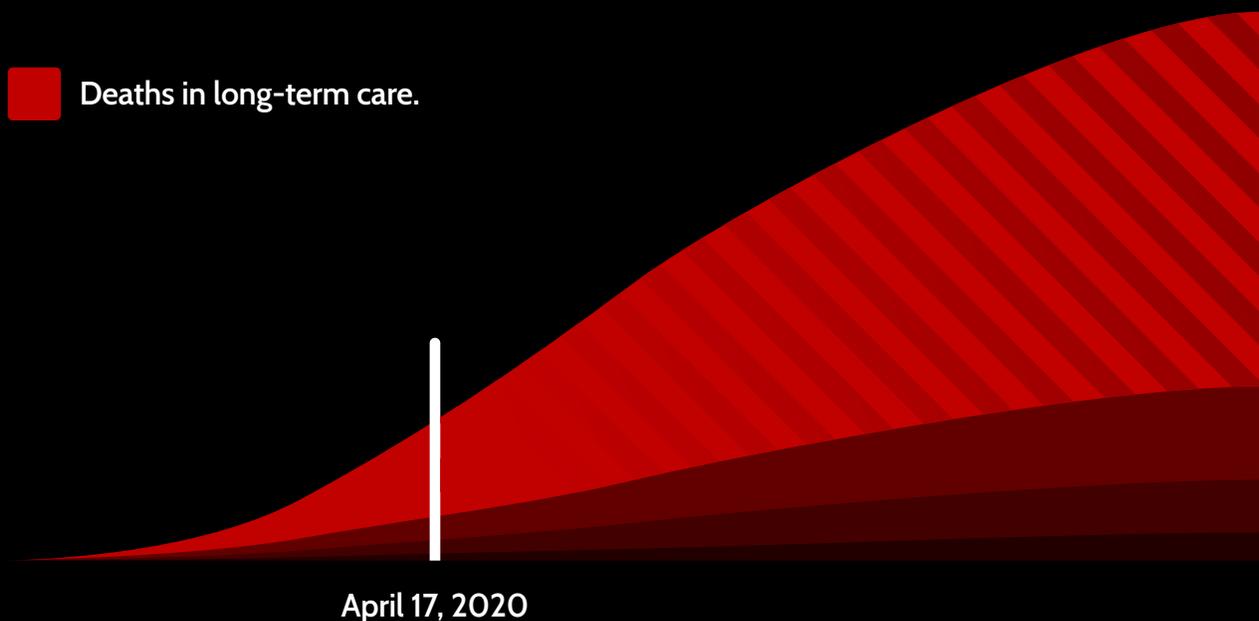
Founded by necessity in 2020

The objective is to provide the best critical tools with a present focus on long-term care, which has unfortunately not received the necessary attention to benefit from the latest technologies.

Once upon a time, a pandemic...

Background

On April 17, 2020, in the midst of the COVID-19 pandemic, the Premier of Quebec, François Legault (CAQ), declared that "the national emergency is the situation in our CHSLDs" (LTCH). The Canadian Armed Forces are called in for reinforcements, the number of deaths is out of control and the Quebec population is experiencing failure through one of the highest per capita death ratios in the world.



Data from the National Institute of Public Health of Quebec

90 days later.

Introduction

On May 1, 2020, Jay was deployed with the Canadian Armed Forces as part of Operational Force 2.1 as a Medical Assistant to help CHSLD Vigi Reine Élizabeth. Like all the medics of Operation LASER, he had to assimilate the work of an orderly, the dynamics of the residents and the operations of the facility within a few days.

With his medical experience, the transition to the tasks and processes of an orderly went smoothly. However, as a UX/UI Architect (User Experience), the significant shortcomings caused by the lack of tools in place, to ensure effective collaboration and communication between members on the floor, came as a shock.

Many technologies are now more accessible than ever and could greatly support the operations of a long-term care facility, as much for the staff in charge of residents than for the administration. A reform fueled by a modern and adapted solution, designed with medical expertise around the realities on the ground is severely needed. With an increasingly aging population, it is crucial to put these new systems in place as quickly as possible. The door is wide open for an incredible change and business opportunity.

This report and the basics for this project were determined after more than 90 days of observation and work in a CHSLD (LTCH) during the COVID-19 pandemic and validated by other members deployed in other centers across Quebec.

On the ground? Constant slowdowns accumulating.

Problems identified

If we take the example of CHSLD Vigi Reine Élisabeth, on paper, everything is in order. The administration is efficient, the regulations and protocols are tight, and the employees are competent and experienced, all in an organized and clean facility. Other than the general problem revolving around the lack of staff across our province, this CHSLD (LTCH) has the ability to be a model of performance.

Unfortunately, the execution of daily tasks shows quite the opposite when viewed from an outside perspective. For the administration, it is to do the best possible with the tools and resources available. For the employees, it is to get used to and condition themselves around the many problems in the method and the organization for the execution of their tasks.

W Let's imagine that for years, there are 5 people who assemble 100 pieces of IKEA furniture a day with a screwdriver. Is it better to add a 6th person or to equip the 5 already there with a drill?

Four major problems have been identified as a major cause of confusion, slowdowns or even errors in the daily operation of the long-term care facility. These problems have been validated by several other members who participated in the operation in other CHSLDs (LTCH), public and private.

Communication

No system is in place to ensure effective communication (regardless of level or discipline) between members. A huge part of the day consists of a hunting game trying to find other caretakers to inform them of a situation or of the changing status of a resident. There is no proper option to leave a note for other attendants for the day causing multiple errors and repetitions in tasks. Important communications from the administration are printed on sheets hung in the nursing station, with no guarantee of being read or seen. Nurses are continually disturbed, no matter the priority of the issue or information, and must act as the intermediary to communicate important resident information continuously throughout the day to everyone on the floor.

Work plans

Work plans (every resident's bible) are extremely poorly structured. Basic crucial information for each resident (size of incontinence briefs, type of soap, level of autonomy, number of side rails, size of lever sling, etc.) is difficult to find through the poorly organized information paragraphs. A complete reading is necessary every time, even in times of emergency, due to the lack of structure and standards in the plans. There is no system in place to leave a daily, weekly or permanent note in the plan. Binders are often moved around by agency staff who try to decipher through the pages a semblance of a to-do list for the day.

Planning

Employees are continually moved between floors and centres (especially agency staff). No scheduling system with a task-based timeline is available to be consulted. Each work plan includes a brief overview of the tasks during a shift, but no overview is available in relation to the other resident's plan. There is instant confusion upon arrival, with no clear timeline for the order of the tasks and those already completed on the floor. Tasks are assigned in the morning through conversation with no trace or way to track progress. For the administration, there are no statistics or traces available on the assignment and completion of tasks in a day. Also, there is no way to indicate a return to a room at a time of day if a resident requests it or if it is necessary, everything is based on trust and the hope that there won't be any forgetting or that the orderly will pass along the request.

Clinical data

One of the most important tasks with long-term care is the constant monitoring of residents' states. Their behaviours, habits, diets, sores and injuries, stools, etc. must be continuously monitored and catalogued. For the majority of this data, there is no system in place to properly catalogue it, let alone track its progression or evolution. For the little amount of data collected, omissions and duplicates are a common occurrence due to the paper binders used, where entries are written without the date, time or name of the attendant. Much of the data is only shared orally and is often forgotten since it is not retransmitted. This lack of structure, organization and accessibility of information about a resident prevents the possibility for an environment that advocates prevention and allows problems to develop. Most of the interventions by the nurses/auxiliary will only happen in the next few days when the condition or issue will have most likely worsened.

Transitioning towards innovation; let's lead with next-generation long-term care.

Vision

It is now possible to use augmented reality to create a three-dimensional skeleton in real-time using a front camera for the simple purpose of putting a virtual mustache on someone; all of these technological advances are used purely for entertainment purposes to be posted on social media.

It's hard to believe that with so much technology at our fingertips, our facilities are still deprived and archaic. A simple web search clearly shows a lack of innovation and effort for long-term care on a technological level with very few platforms or solutions available.

Employees should have a toolbox on them at all times to help with the communication and organization necessary to perform throughout their shift. Information and observations should be easily accessible to current and future shift members, as well as for anyone arriving in the middle of a shift throughout the day. Work plans should be computerized, structured and standardized with simple iconography. A continuously updated timeline would guide new and on-shift employees with upcoming tasks and resident requests to make sure everyone is on the same page. Everything should be in real-time with a trace of all actions.

The administration would have a global view of all the activity within its center instead of being consulted for each case individually. Changes to regulations and protocols would be centralized and accessible at any time to allow quick and efficient adjustments to center operations.

Project Neptune will be built with the latest web technologies for a solid and secure foundation that will last for many years. The platform will be accessible from any browser on any platform to maximize flexibility in the choice of device used. Updates will be seamless and instantaneous as the product is built as a cloud service. A rudimentary wireless internet connection from the nurse's station will allow for easy deployment of a lightweight network to support Neptune and its real-time features. For less than a hundred dollars, each employee can be equipped with an inexpensive tablet or mobile device to connect to Neptune and be ready for their shift with the platform in their hands.

Neptune will be built around three main functionalities. The web nature of the project as well as its subscription model will allow constant updates to make the project evolve and adjust its interface and functionality as it goes along.

Timeline

Based on the Japanese Kanban management process, each day, a timeline is populated with the day's tasks and additional tasks for the week. Observations and personal notes/alerts will be automatically generated. This will enable regulars to immediately pick up their usual tasks and residents at the beginning of their shift, while newcomers can easily embark on the next task that needs to be completed and management can stay informed in real-time about the status of each task, with alerts for the most critical ones. The timeline will be updated automatically based on the information in the work plans on each resident and when a resident is added or removed from the floor. Any confusion on the floor about what has or has not been completed will be eliminated, thus greatly improving staff movement between different floors during their shift.

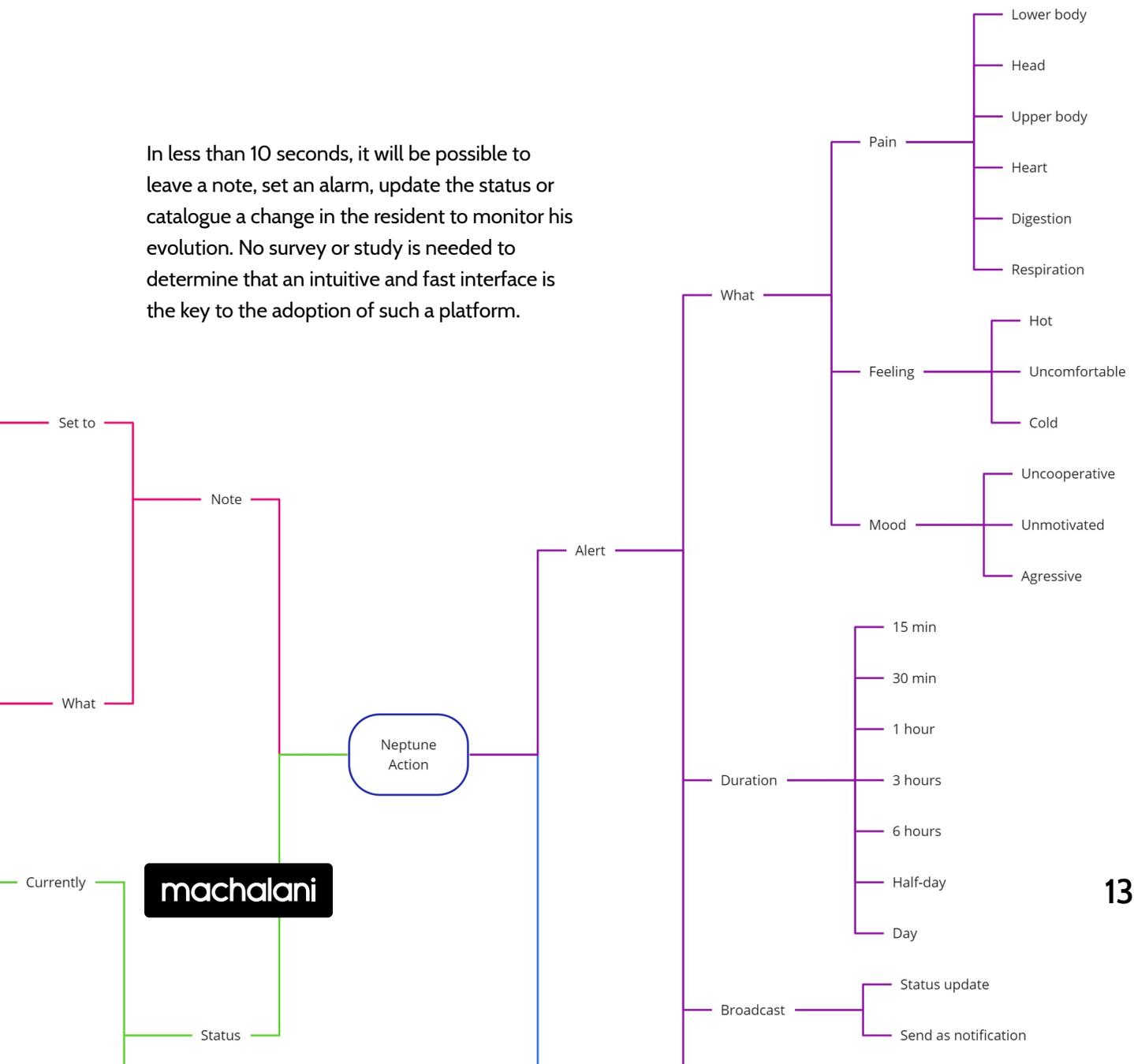
Work plans

All work plans will be computerized, but most importantly structured within a referable framework. Each resident will have a timeline which blends with the day's timeline with their personal preferences, on-site staff recommendations and family requests. Clear iconography and navigation will highlight critical information about the resident such as control measures, level of autonomy, sling size, etc. Resident history and two-way translation tools will be available to facilitate communication. Practical tools will assist staff in providing personalized service and care to each resident. For example, if a plan mentions that the resident speaks a foreign language, a real-time translation tool will be provided within the platform to assist in communication.

Dynamic interface

The main driver behind Project Neptune will be its interface designed from day one to adapt to the dynamics of long-term care. The addition of all of these features at your fingertips will greatly increase the quality of care given and the morale of the staff: room exit alerts for control measures, real-time view of staff position on the floor, timers to respond to residents' needs or to move them to avoid bed sores, the ability to add comments/suggestions on the work plan, alerts on the resident's condition/mood for the day, latest news and instructions from the administration with acknowledgements, etc.

In less than 10 seconds, it will be possible to leave a note, set an alarm, update the status or catalogue a change in the resident to monitor his evolution. No survey or study is needed to determine that an intuitive and fast interface is the key to the adoption of such a platform.



Currently **machaloni**

From a document to an action plan.

Development

Project Neptune can be developed quickly and efficiently thanks to a team already experienced with the latest web technologies and the realities in long-term care facilities. The primary objective is to have a product ready to be tested and deployed in care facilities quickly with key functionalities for fast and immediate impact. Following the adaptation period and the necessary patches, Neptune will then be continuously updated to include new functionalities and eventually replace old management systems already in place.

W Developed by a new company in Quebec with no financial, technical or other restrictions in order to ensure an economical, fast and efficient development.

A four-phase development will ensure smart use of the budget and a clear breakdown of each stage with the objectives to be achieved. These phases can easily be used as milestones to be reached at different levels of investments.

Phase 1 Research

Mixed study and detailed mind map

Further research into the needs of long-term care facilities through a mixed-methods study. A prioritized list of features and needs will be established to guide the development of the platform. Neptune as a whole will be structured both at the interface and technical levels based on the information gathered in the study.

Phase 2 Mockups

Interface with interactive model

Development of the platform's wireframes to test ergonomics during tasks. Design of the first mock-ups of the interface demonstrating the navigation and functionalities of Neptune. They can be tested with control groups against existing solutions to validate efficiency and ease of adoption.

Phase 3 Prototype

First version for pilot project

Development of a first version of the Neptune platform for the creation of a pilot project. Integration into long-term care facility floors to collect information on performance and productivity gains. Throughout the program, adjustments will be made to the platform based on feedback and results.

Phase 4 Deployment

Version ready for mass adoption

Development focused on migration, adoption and marketing. A first version of Neptune is ready with a deployment guide for IT departments and remote support. Ongoing development based on the priority list to replace aging systems in place and provide standardization of tools.

Schedule

Two major variables affect the project timeline: facilities' collaboration and funding.

Active participation by long-term care facilities will provide more information on needs and will quickly move the project in the right direction following the study. For subsequent phases, data collection will be critical.

Funding at any phase of the project will allow for talent acquisition to accelerate the development of the platform and the deployment of the platform in the field.

Phase 1 will allow us to build a realistic timeline based on a thorough needs analysis and the resulting technical plan. Phase 3 can be achieved within a few months, even with the current team, and the focus will be on the three key functionalities.

The main objective is to reach Phase 4 quickly enough to be in the hands of the next generation workforce where retention can be greatly increased with the help of modern tools.

For the health of the beneficiaries and of the company.

Market

In addition to serving the needs in Quebec, Machalani Inc. will be able to offer Ontario, Canada and the rest of the world a solution developed in Quebec to meet the modernization needs of long-term care centers and residences. The pandemic has shed a clear light on the lack of management and resources in these facilities around the world. Quebec has been severely impacted and could be a world leader with a cost-effective, modern solution. A quick search shows that there is no modern solution to support this care.

Business plan

A monthly subscription plan per care provider will be implemented for the use of Neptune. This business model, currently used by service giants such as Microsoft, Adobe or Atlassian, has proven to be very successful. It offers a competitive and flexible entry price for centers and a stable, consistent and predictable revenue stream for Machalani to ensure ongoing development and continuous support of the platform.

With over 2,000 long-term care facilities and residences in Quebec alone, tens of millions of dollars in revenue is easily achievable with a minimum monthly payment per orderly. For a facility, the annual service cost for all of their care providers is considerably less expensive than a single annual base salary of a new orderly, thus the integration of Neptune becomes a no-brainer to dramatically increase efficiency and morale on every floor. Defined and highly flexible guidelines will ensure that the cost of acquiring equipment will be minimal and inexpensive to encourage deployment of the platform throughout the facility.

The door is wide open for an incredible business opportunity by being an indispensable leader in next-generation care for an aging population. It is possible to turn our difficult episode with CHSLDs during COVID-19 into learning, reaction and Quebec ingenuity in the face of a problem.



Québec 
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