

## Executive Summary

Today, end of life planning is both one of the most important; and one of the most mishandled aspects of healthcare. We all expect to die surrounded by friends; relatively free from pain. The reality is far from it for most of us.

Old age is typically a set of bodily systems that wear out in combination or singly. Though there is much modern medicine can do to assist; there is a falling off point where the individual, and his or her caretakers, suffer from the aggressive, uncoordinated care of specialists. There is even less support when it is time to move to palliative care and end of life planning. End of life plans are rarely respected. Those who have documented plans in place, such as Do Not Resuscitate (DNR), or in a few states the Medical Orders for Life-Sustaining Treatment (MOLST) or Physician Orders for Life-Sustaining Treatment (POLST) rarely have their wishes met at end of life.

Reasons for this failure are many, and fall into 3 categories: 1) the process is paper and manual so there are few ways to collect and access the latest plans, 2) few tools to facilitate “the Conversation” early, and 3) the data in DNRs, MOLSTs and POLSTs is not available bedside, or hard to rely on when it is because the paper is unreliable, unfindable, or inaccurate. Today, there is no widely available, trusted form of DNR available on mobile applications or via data specification to the bedside at the time of end of life.

## Solution

Healthcare needs a solution that allows individuals to create, share and manage their DNRs, MOLST/POLSTs, easily. Moreover, they need to be able to update and change the information at any point. Caretakers need to a way to quickly and reliable access trusted DNR results in real time using the web, a mobile application or their own electronic health record or healthcare management system.

Live and Leave Well™ is a complete solution that provides both a consumer mediated exchange of end of life plans; and creates a transportable package of data about that person’s end of life plans that can be scored for goodness and shared with multiple systems using a combination open APIs and direct integration.

**Live and Leave Well (LLW.com) is an end of life planning platform designed to help individuals create, manage and share end of life plans.** LLW.com:

- 1) **Collects** end of life plans, starting with DNRs, MOLST, and POLST via web and mobile application.
- 2) Facilitates “the conversation” with individuals, doctors, family and friends.
- 3) **Scores** the DNR, MOLST and POLST for validity, completeness, and utility.
- 4) Provides downstream data consumers such as EHRs, HMS, with **a single point of truth for DNRs.**
- 5) **Delivers** the end of life plan to the caretaker at end of life **via mobile app and web.**

## Benefit

Healthcare quality can be improved significantly when end of life plans are valued, shared and respected. Good DNRs prevent patients being wrongly resuscitated, incurring high costs of ICU treatment and re-admissions. Further, as the population ages, studies show there will not be enough

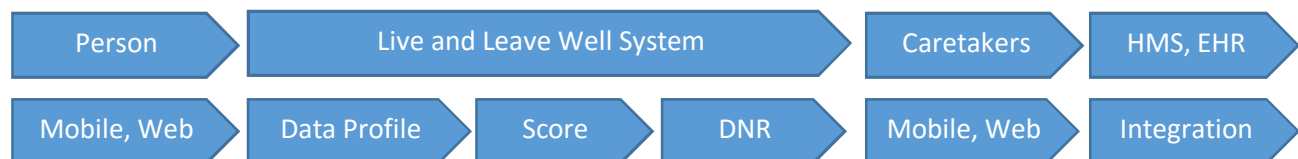
long term care facilities, hospices and other palliative care treatment centers based because the populations is aging much faster than the top possible rate of growth for such programs. As a result more people will depend on family, friends, and at home healthcare workers caring for them at end of life. Accurate end of life planning and sharing will be essential to offering the best end of life care in the future.

## Solution Methods and Technology

### Platform Vision

LLW.com will offer mobile apps (Android and IOS) and a web site to collect DNR data. Once collected, LLW.com will score the data for goodness and completeness. At the same time, LLW.com sets up a customer profile using customer relationship management software. This profile can be managed by the user, and LLW.com can help the individual increase their score by sending reminders to improve compliance to state regulations, finalize signatures and other risk reducing actions. The system will continue the relationship by asking the patient to recertify annually, and incorporating the patient's electronic healthcare record as necessary. Live and Leave Well will obtain the user's permission to share a subset of their end of life plan with doctors, long term care facilities, emergency medical professionals and friends and family. They can share that information via web site access, direct data integration or mobile applications. The data delivered to third parties will be minimal and designed to deliver a reliable end of life plan at the time of end of life.

LLW.com will create APIs using the HEART specification to directly integrate to its own output applications and to third party consumers of this single point of truth for DNRs. While we favor open standards, we plan to create custom integrations as required. For third parties with web-based applications, we will also create a "white box" version of the output data such that third party systems could simply present our output inside the HTML frame and branding of the provider.



### Proposed for The Prototype

For a prototype, LLW.com has 30 participants from one state whom we would use to collect DNRs, score them and then integrate to at least 2 recipient partners (provided by us).

For the prototype we will focus more on:

- 1) Authentication and roles in the system (DNR creator or DNR recipient)
- 2) Integration to partners via APIs
- 3) Data Security

We will focus on a web interface to collect and score the DNR data, HIPAA compliance, data security, authentication and delivery of the DNR to a mobile device (IOS) and directly integrated partners, such as a long term care facility or ambulance service.

## Technical Tools and Approach

Live and Leave well intends to use open standards and tools. Mobile applications will start with IOS and move Android. The web site will be designed to be responsive and easy to use. The platform will operate as a data transformation and delivery service. Micro-services operating below the display layer of the solution will complete the tasks of writing user profiles to customer relationship management and scoring the documents. Once scored, the system can suggest ways to improve the score, and utilize predictive analytics to direct marketing and data delivery services.

One of the keys to the solution is ensuring authentication of users, and getting their permission to share that information at every step. We will use the HEART API to expand the sharing capability of the solution by multiple 3<sup>rd</sup> parties. The Live and Leave Well Data Repository will house live and scored end of life plans, along with their shared status as delivered by the API. Any 3<sup>rd</sup> parties can subscribe to for immediate, validated end of life results, but can only access them if permission has been acquired by LLW.com. Multiple points of authentication and of verifying the right to share the data will be required.

We plan to use Microsoft Azure to ensure HIPAA compliance for the platform. We will use PGP for Encryption of Data at rest, and Encryption of Data in Transit. We will further be responsible for setting Least privileged access models, Data Preservation policies (DR, BC), Strong Authentication policies and defense in depth security strategies. Loading Healthcare data will rely on Apache Scoop and UIMA. Code base will be Java and C++.

## Development Plans and Timeline

### Prerelease (1 month)

- Obtain data escrow and insurance
- Set up Azure for Healthcare
- Setup HIPAA security for developers and local, physical hardware security
- Define permissions and authentication requirements

### Release 1 “User Creates DNRs and Authorizes Data Sharing” (+ 3 months)

- Mobile application for IOS (User View, Caretaker View)
- Web Application (Responsive Design)
- Create CRM action plans based on
- Integrate Patent Pending LLW Risk Scoring™
- Create user profiles with scores

### Release 2 (+ 3 months) “Sharing DNRs Release”

- White Box (Unbranded web version for 3<sup>rd</sup> party vendors) Web Application
- Create and Publish Live and Leave Well API™ as an open API for any approved (compliant) 3<sup>rd</sup> party
- Leverage HEART API to authenticate from our service to multiple subscribers in real time.
- Integrate to at least 2 partners

### Release 3 (+3 months) “Sharing with Friends and Family”

- Update and add Mobile Android (User View, Caretaker View)
- Create sharing center with Health Proxy capability
- Add passive data collection tools and quizzes to help make end of life decisions
- Create educational content to help families and users

## Financial Overview

The Live and Leave Well business model is Freemium for individuals, subscription based for institutions wishing to access the data, and flat fee for institutions interested in buying anonymized data research.

- User Business Model is Freemium with a target of \$45 annual revenue per user
- Free one free submission DNR, PR, POLST, MOLST and sharing with 5 people
- Additional charges for: Managing multiple users (managing your parents and you), updates to improve your score per update/annual fee, phone services to coordinate care, inform proxies and update records per occurrence
- Subscription services to institutions (anonymous/aggregate) ~ \$10,000 - \$50,000

### Available Market ~ 89 Million

People over 65 years in U.S. 39 Million and people over 40 years who are caretakers. Nearly half (47%) of adults in their 40s and 50s have a parent age 65 or older. [Link to Pew Research](#)

### Costs Overview

Costs will primarily be customer acquisition costs and development. For the prototype, the \$5,000 prize money would be 90% used for software development and platform setup. The remaining \$500 would be used to support customer acquisition. Legal fees, software and marketing is currently self-funded by the organization. We plan to limit costs by limiting the number of states we rollout to on a schedule that allows us to gain revenue, before acquiring additional users. Another way to reduce the cost of customer acquisition could be partnering to add users by partnering with a third party such as the healthcare advocacy groups, veteran’s associations, and insurers.

## Risks, Mitigations and Insurance

Regulatory and malpractice risks are no greater than the inefficient paper process used today. Compliance with multiple state regulations, and possibly multiple data standards is not a risk to quality as to completion times. Live and Leave Well leadership has experience with meeting multiple state compliance requirements. Further, LLW.com will work with advocacy and state governing organizations to ensure compliance. HIPAA compliance will be managed in a separate process to ensure our data, physical security and PPI processes are flawless.

Identifying patients on the scene is a concern. LLW.com plans to combine a telephone service and physical identification path to help ensure against identification errors. The HEART API will help ensure we manage the risk of sharing any data without proper permissions.

<b>Leave and Leave Well</b> <b>High Level Financials</b> <b>Model: Freemium for individuals &amp; subscription for institutions</b>						
Assumptions		Year 1	Year 2	Year 3	Year 4	Total
Cost per Customer Acquired	\$ 35					
Number Individuals Joining		10,000	20,000	30,000	70,000	130,000
Number Institutions Subscribing		2	4	8	10	24
Avg Monthly Revenue/Individual	\$ 65	\$ 650,000	\$ 1,300,000	\$ 1,950,000	\$ 4,550,000	\$ 8,450,000
Avg Monthly Revenue from Institutional Subscribers	\$ 10,000	\$ 20,000	\$ 40,000	\$ 80,000	\$ 100,000	\$ 240,000
<b>Costs</b>						
Development		\$ 70,000	\$ 150,000	\$ 200,000	\$ 200,000	\$ 620,000
Integration		\$ 45,000	\$ 100,000	\$ 150,000	\$ 150,000	\$ 445,000
Customer Acquisition		\$ 350,000	\$ 700,000	\$ 1,050,000	\$ 2,450,000	\$ 4,550,000
Total Cost		\$ 465,000	\$ 950,000	\$ 1,400,000	\$ 2,800,000	\$ 5,615,000
<b>Revenue</b>		\$ 670,000	\$ 1,340,000	\$ 2,030,000	\$ 4,650,000	\$ 8,690,000
Net Profit		\$ 205,000	\$ 390,000	\$ 630,000	\$ 1,850,000	\$ 3,075,000

## Participant Roles and Rationales

### CEO Jocelyn Byrne Houle <https://www.linkedin.com/in/jocelyn>

Jocelyn has +17 years' experience delivering large scale financial applications. As the Sr. Director of New Product Development for Freddie Mac, Jocelyn designed and delivered 3 industry standard risk evaluation systems. Jocelyn has a patent for the risk model she designed to evaluate home values throughout the U.S. She also has deep experience with technology startups and platform companies. Jocelyn was the founder of the Adrenaline Group (80 people and \$10 million in billings annually) as well as a Product Manager for Microsoft.

### Lead Technical Advisor and Architect – Carlos Espada <https://www.linkedin.com/in/skysoft>

Carlos led the implementation and management of the Heart and Lung Associates of America. He has deep knowledge of medical data standards, risks and implementation requirements. As the lead programmer for Fresenius Medical Care, he worked directly with patients in the dialysis unit, hospitals, and ambulatory centers where he was responsible for developing and implementing information systems required for the gathering of clinical data for research purposes.

### Chief Technical Advisor Scott McLoughlin <https://www.linkedin.com/in/scmcloughlin>

Scott has +20 years' experience as a C++ developer and entrepreneur. Also a founder of Adrenaline, Scott served as that organizations CEO for 5 years. A true full stack developer, Scott sold his artificial intelligence language the U.S. Army. Fun fact, Scott also wrote Harvard University's UNIX handbook.