



Komsky JC, Nelson D, Adams AE & Pompilio, DV

SimpleC, LLC

SimpleC implements artificial intelligence, by IBM Watson, to perform natural language processing to categorize qualitative into quantitative variables.

Introduction/Background

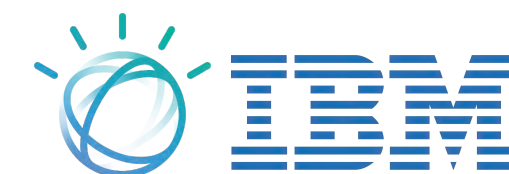
Over 133 million Americans have a chronic disease, including cardiovascular disease, diabetes, and dementia. Over 40% of adults in the US have two or more chronic conditions (CDC, 2019). Chronic diseases can drastically impact an individual's quality of life and affect how they perform daily activities.

Older adults prefer to age in place which is more challenging with multiple chronic conditions. Technology can support care at home and improve adherence to a plan of care through reminders, context, and personalization.

SimpleC is a cognitive and behavioral health technology company that delivers research-based digital therapeutics to improve care and quality of life for individuals with cognitive impairments and chronic conditions.

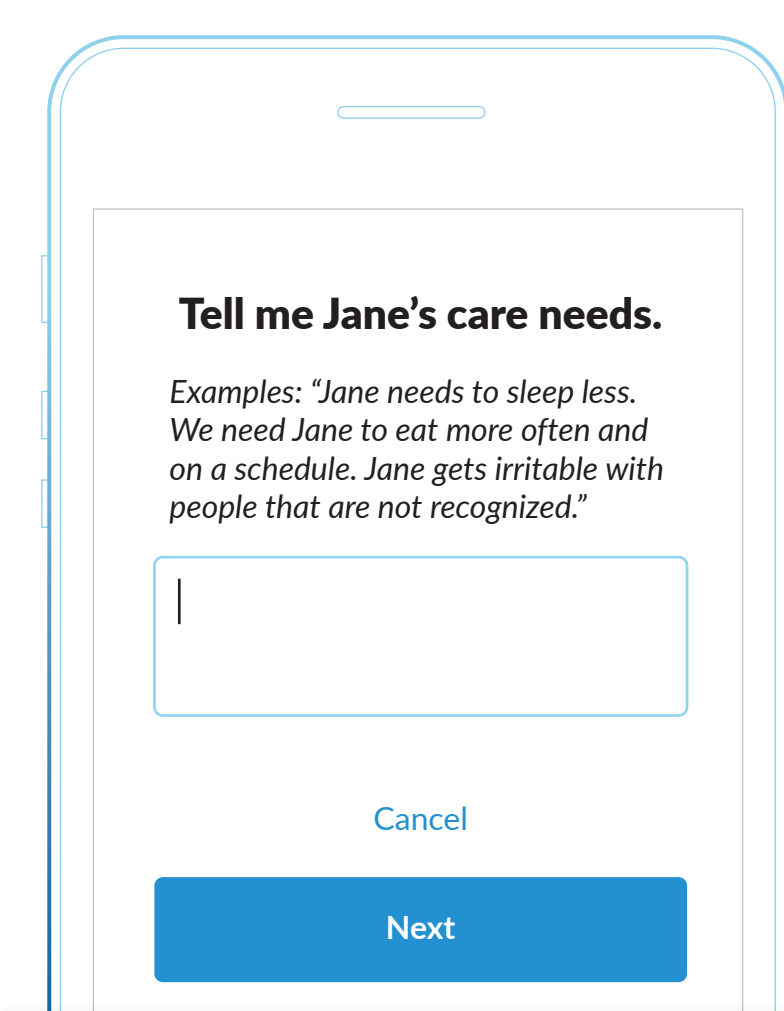
Users create a care profile on the Care 360 platform and freely input descriptions of symptoms and care-related challenges in their own words. Their natural language input is processed using artificial intelligence to code free responses into discrete data points.

We present a series of empirical case studies (N=3) in which caregivers of persons with dementia are observed as they interact with our Watson-driven system.



Methodology

- Natural Language Input**
Participants reported symptoms and care needs of care recipients as free response.
- Analysis by Artificial Intelligence**
Artificial Intelligence-driven system processed free responses in real-time.
- Artificial Intelligence Output**
Generate and display a list of care goals relevant to the free response input.
- Output Validation**
Participants select desired care goals from the list.
- Application of Results**
Assign and deliver Therapies through SimpleC Companion™



Family Connect™



SimpleC Companion™

Results

Case Study 1	
Natural Language Input	Artificial Intelligence Output
We need [mom] to drink more water.	<input checked="" type="checkbox"/> Hydration <input checked="" type="checkbox"/> Increase Hydration Independently Through Cuing
Output Validation	
"Yes, Hydration! Yes!"	
Case Study 2	
Natural Language Input	Artificial Intelligence Output
Have some fun!	<input type="checkbox"/> Verbal Aggression <input type="checkbox"/> Irritability <input checked="" type="checkbox"/> Depression <input type="checkbox"/> Improve Sleep Patterns <input checked="" type="checkbox"/> Increase Individual's Participation In A Physical Activity <input type="checkbox"/> Do A Physical Activity That You Enjoy <input checked="" type="checkbox"/> Go For A Walk <input type="checkbox"/> Time To Exercise <input checked="" type="checkbox"/> Increase Individual's Participation In A Cognitive Activity <input checked="" type="checkbox"/> Enjoy A Game Of Solitaire <input checked="" type="checkbox"/> Name That Flower <input type="checkbox"/> ...
Output Validation	
"Go For A Walk would fit her better than Time To Exercise. But Do A Physical Activity You Enjoy, that kind of covers both. But I think she would have trouble thinking of a physical activity she enjoys. So I think it would be easier to say Go For A Walk."	
"Name That Flower! She's an avid gardener so I think she might enjoy that."	
Case Study 3	
Natural Language Input	Artificial Intelligence Output
She has a schedule for sleep bedtime @600pm. Awakens @900am.	<input checked="" type="checkbox"/> Sleep <input checked="" type="checkbox"/> Decrease Amount Of Time Slept Throughout The Day <input checked="" type="checkbox"/> Good Morning, It's Time To Wake Up <input type="checkbox"/> It's Time To Wake Up <input type="checkbox"/> Reduce Napping To Improve Sleep <input checked="" type="checkbox"/> Reminiscence To Decrease Sleep <input type="checkbox"/> Depression <input type="checkbox"/> Dressing <input type="checkbox"/> Anxiety
Output Validation	
"That would be a good one, during the day. And we can do Good Morning, Time To Wake Up. Because that's when it's hard for her to get up."	

Conclusions

Artificial intelligence was successful at analyzing the qualitative data in the case studies presented.

In each case study, participants validated the output generated by our system. Participants selected at least one care goal identified by our Watson-driven system from their natural language input, leading to new interventions delivered to the care recipient.

Verbal feedback indicated satisfaction with the automated interpretation of their natural language free response input.

Such implementation of artificial intelligence can be used broadly in psychology research to automate the interpretation of qualitative free responses into discrete quantitative variables. This can increase efficiency and accuracy of coding study data.

SimpleC is now working on using artificial intelligence to interpret physicians' notes in EMRs to provide a more complete view of a patients' care needs for multiple chronic conditions.

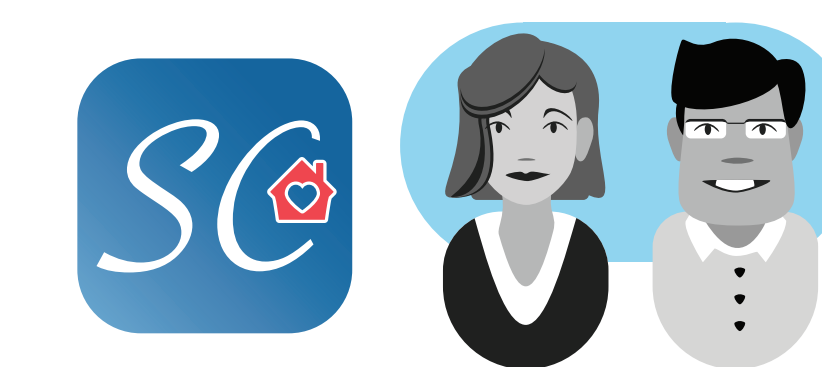
SimpleC Care 360 Platform of Care

Care 360 platform captures all health information to notify and alert the recipient, clinicians, and family of change in health status and suggest improvements.



SimpleC Companion™

The Companion communicates, using mobile technology, the right message at the right time. Stimulating digital therapeutics present and automate the family and care giver hands-on knowledge. It is a complete non-drug approach.



Family Connect

A mobile application that engages all active family members, in the platform, so everyone works together to communicate and support the care recipient at any time of day. Input to Care 360 is captured and used to improve care.



Clinical Connect

Clinicians are constantly tracking health status across multiple care recipients. Clinical Connect creates an easy way to capture health measures for immediate use on the platform to identify, and head off, health care events for each individual recipient.

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Contact Us

Dan Pompilio, CEO
dpompilio@simplec.com

Dr. Jane Komsky, Director of Risk Analysis and Cognitive Research
jkomsky@simplec.com