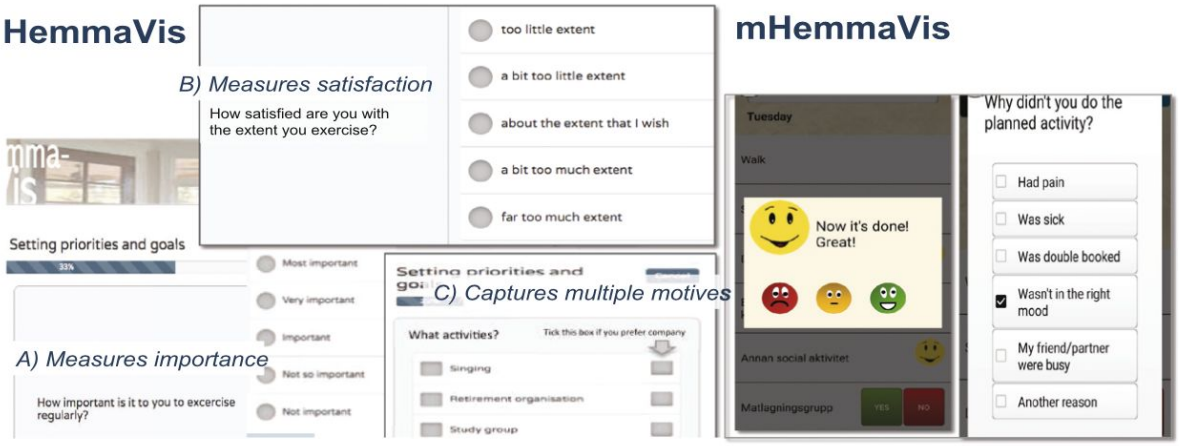
Literature Survey

This section will be discussing the work done so far related to the Persuasive system. There are several studies that talk about the Persuasive system for elderly people, this section will have a brief on those studies. Apart from these studies, there are mobile applications developed on persuading aged people, this part will reflect the comparison and limitations of such applications which is the must for a Persuasive system.

Flowie: A Persuasive Virtual Coach to Motivate Elderly Individuals to Walk (2009) - has described briefly about encouraging elderly people to walk more than their usual walk. The design considered walking as a primary healthy exercise. The study referenced and incorporated a few principles regarding the persuasive concept.
A pedometer connecting to a user interface in the form of a photo frame hung on the wall. The pedometer records the walking of the user and displays it on the interface.

The above figure was the “Flowie” designed by the author that persuades the user in walking. The figure (left) is the general view, the figure (center) shows the day’s overview, and the figure (right) displays a graphical representation of weekly analysis.
The author concluded saying the pedometer was not an appropriate device for the system since it takes only walking into account and not any other activities, the system might go wrong in the environmental circumstances and also about the user condition.
Though the system was intended to control diseases after aging, it did not specifically provide suggestions for the particular aging diseases.

Personalised Persuasive Coaching to Increase Older Adults’ Physical and Social Activities: A Motivational Model (2017) - a study on persuading elderly people aimed at encouraging the user in participating at various social events and physical activities.
The author has described an agent who would guide the user to perform their routine. This agent was designed with the help of a “Motivational model”. The motivational model decides what should be the agent’s reaction in every consequence. Therefore an algorithm was written for the situation and for the reaction of agent in various situations.

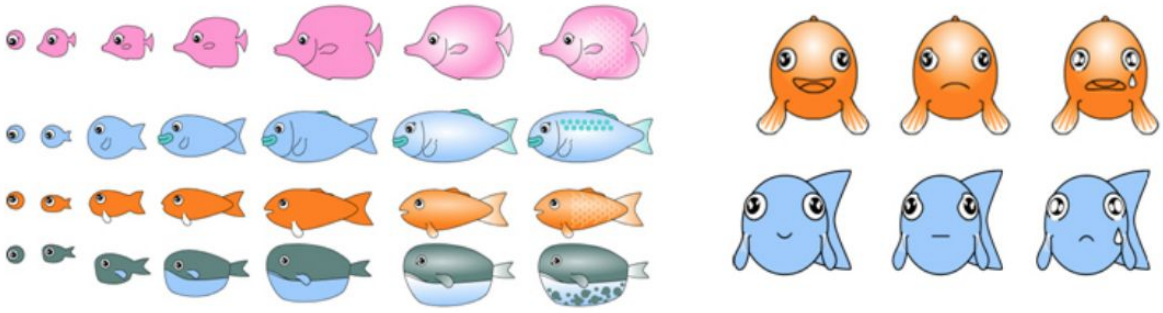


The above figure shows HemmaVis mobile application is used for collecting user's data and mHemmaVis is used for modifying the user's routine.

This study concluded with a theory that examines various behavioral aspects, and also an algorithm was designed to persuade the user. These theoretical factors were incorporated into a mobile application that promotes users to participate in physical and social events. The author also stated that the approaches for adverse results will be discussed in further studies.

Fish'n'Steps: Encouraging Physical Activity with an Interactive Computer Game (2006) -

A study designed a game to encourage users towards physical activities. The user activities are measured through a pedometer. A virtual fish was designed in the game as a pet in which the user's activity will result in the growth and happy face of the pet, else the poor activity of the user results in no growth and sad pet.



The above figure shows the growth of the pet(fish) as the user performs their activity and achieves their goal, and also shows (right) the positive(happy/smiley face of the fish) and the negativity(crying/sad face of the fish) of the user's performance.

The author concluded saying the users were excited and interested initially but their interest came down gradually within a few weeks. Users were not happy with wearing a pedometer and putting the information to the public kiosk.

Previous study comparison

Previous study	Focused on	drawbacks	persuades
Flowie: A Persuasive Virtual Coach to Motivate Elderly Individuals to Walk - 2009	Waking	Environmental circumstances, user condition	The exercise was constant but there was no increase in the walk.
Personalised Persuasive Coaching to Increase Older Adults' Physical and Social Activities: A Motivational Model - 2017	Physical and social activities	Adverse results	No usability testing done.
Persuasive technology to support active and healthy ageing: An exploration of past, present, and future - 2018	Walking (obesity)	Users were not happy with uploading information in a public kiosk, and the design didn't have a constant user interest.	Yes, in the initial stage

Mobile Application comparison

Application name	mobile	android/ios	Age group	free/paid	Focused on
7 Minute Workout	yes	ios, android	everyone	Basics free	workout
MyFitnessPal	yes	ios, android	everyone	Basics free	Burning calories by food diet
MapMyWalk	yes	ios, android	everyone	Basics free	walking
Daily Yoga / Pocket yoga	yes	ios, android	everyone	Basics free	yoga
Tai chi for seniors	yes	ios, android	Above 50	Basics free	Tai chi

The above table shows the comparison of the mobile applications that are highly used for fitness. **7 Minute Workout** mobile application is basically designed for everyone irrespective of age, and it concentrates more on workouts or physical exercises. The application is not for any particular diseases/health conditions, its just the daily basic exercises.
MyFitnessPal looks more on burning calories with a food diet. Various food diets and exercises are suggested and kept track for the user to burn calories and reduce/gain weight.

MapMyWalk application provides various features to support walking for the user. The application provides GPR facilities for tracking the user's walking.
Daily Yoga / Pocket yoga promotes users of all age groups for daily yoga to keep them fit and flexible.
Tai chi for seniors is especially for elderly people of age above 50 years, this application tends to train users tai chi.

The present applications are not specifically for elderly people and also are not particular about aged diseases. As most of the elderly people are not highly digitalized, application with self-set goals or too many selections and modification of the goal on the application would not be a feasible option.
As all of the studies focus on persuading elderly people in improvising their daily routine into healthier and also to get rid of aged diseases it is very important to provide a system with user-friendly features, easily operable, and motivates the user to maintain the routine consistently.

Principles to persuade

1. **Reciprocity**
   take and then give policy. Accept the offer and you are bound for the offer and indirectly acceptance of doing something in return.
2. **Commitment & Consistency**
   We follow a certain routine in life for a long time, the theory says we tend to maintain the same. The written or verbal form of goals would make people stand for it no matter what and even after the goals are removed from the written or verbal form it will be followed as it is mentally accepted by people in their mindset.
3. **Social Proof**
   Cialdini says we follow or perform some action especially by looking at others.
4. **Liking**
   It is very obvious that we like a person who is just like us in terms of the way of thinking, and also the same likings so do we have, these are few things which make us like someone. Cialdini says the person we like asks for something it's natural human tendency to most likely to tell yes or give an acceptance no matter what. This tells us a person can easily be persuaded by someone they like.

5. **Authority**

   We tend to follow the instructions or give acceptance for people who have certain authorities, for example, we follow and accept doctor's wordings. We believe the authorities are the experts in their work field.

6. **Scarcity**

   We are so triggered to get something that is limited and the value for it will go high, but the things that are available always comparably will not have much value or demand. For example, willingness to buy a product that is not in stock can persuade a person.

Primary Task Support

The primary task support consists of design principles that help in accomplishing the user's tasks. The below table shows the design principles in the primary task.

Principle	Explanation	Application features
Reduction	A system that reduces complex behavior into simple tasks helps users perform the target behavior, and it may increase the benefit/cost ratio of a behavior.	the application would notify the user to perform activities to their particular physical health issues (example: hypertension, arthritis)
Tunneling	Using the system to guide users through a process or experience provides opportunities to persuade along the way.	Guides the user in each step to achieve their activity goal.
Tailoring	Information provided by the system will be more persuasive if it is tailored to the potential needs, interests, personality, usage context, or other factors relevant to a user group.	Displaying the activity reviews in concerned with the user's understanding (example: in a simple way like in numbers and graph)
Personalization	A system that offers personalized content or services has a greater capability for persuasion.	Goals are set for each user depending on their physical health state.
Self-monitoring	A system that keeps track of one's own performance or status supports the user in achieving goals.	Monitors the user's health (example: pulse rate, walking.)

Simulation	Systems that provide simulations can persuade by enabling users to observe immediately the link between cause and effect.	The status of the user before and after activities will be displayed in a graph (monthly review)
Rehearsal	A system providing means with which to rehearse a behavior can enable people to change their attitudes or behavior in the real world.	The physical activities(exercises, yoga) video will be displayed for the user to perform their activity.