**GO\_PERSONAL HEALTH RECORD – APPENDIX**

**OFFICE SECRETARIAT**

**TECHNOLOGY**

**IMPLEMENTATION STUDIES**

**OFFICE SECRETARIAT STAFF, LOCATION AND CONTACT DETAILS**

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**TECHNOLOGY**

Chatbot Technology

Database Technology

Server Technology

Chatbot Technology

ChatBot (CB) is simply a computer software. It simulates a human conversation. A CB will carry

out this conversation via messages or voice commands which either way is a trivial programming

task. Anyway CBs are programed to work independently of the humans (Elupula 2019). CBs are

particularly useful in repetitive tasks in human conversations for instance like taking

consent for a research project. Here probably the CB has added advantage of strikingly

similar verbatim output for each and every recruit in a sample running upto even hundreds

of thousands. CBs are also now known as Intelligent Personal Assistants. This is because of the

AI based programming used in some of the most modern bots (Walch 2019). We designed and

deployed several CBs for this study for the following reasons :

1. The scalability requirements - we need to recruit as many as possible for the success of the project

2. The efficiency - the repeatability and reliability of the conversation

3. Cost benefit - it is thousand times cheaper to use a CB rather than physicians to elicit some of the most repetitively asked questions in traditional medical history taking.

4. Availability of the technology for the company sponsoring this program

5. Reusability of the some of the CBs for the same purposes

Database Technology

PHR is an electronic personal health record designed and developed using JQM hybrid technology

to be deployed over the internet as a web application. The data is saved in a MySql database

server at the namecheap.com hosting company. The PHR system runs on MySQL server

version: 5.6.36-82.1-log - Percona Server (GPL), Release 82.1, Revision 1a00d79 on PHP

version: 5.6.30. At the end of the study a master database file will be generated using the

MySql server and kept at the office secretariat. The master database file will be generated in

the following 5 file formats - CSV for MS Excel, open document spreadsheet, CSV, pdf and

XML formats. This will help the research team to migrate the data into SPSS, SAS or any

other statistical package for further data analysis. Once this is done original data then will be kept for a maximum duration of 1 year at the server and then permanently deleted from the server.

Server Technology

The PHR system is hosted at Namecheap company https://www.namecheap.com.

Namecheap is an ICANN-accredited domain name registrar providing domain name registration

and web hosting based in Phoenix, Arizona, US. Namecheap is a well known hosting provider with

11 million registered users and 10 million domains. It has many security features included in its

plans. Overall, Namecheap is good domain registrar and provide domain names and web hosting

services at reasonable prices and industry standard security features, flexible domain management

services. They also offer around-the-clock customer support and dynamic DNS performance.

In addition Namecheap offers SSL certificates and DDoS protection which provides acceptable

security for the systems relevant to this project.

**IMPLEMENTATION STUDIES**

Implementation studies measure the success of the implementation of an intervention. This is important because the outcome of an intervention outside of the research context to a great extent depends on the implementation. The designers of implementation of research interventions usually prepare an implementation strategy. Implementation strategy usually includes the steps and modifications required to carry out the intervention as studied in the research context. These steps and modification of course should not compromise the intervention in a way the outcome expected is changed. Usually many actions can be taken and in fact should be taken realistically speaking to apply many of the research findings reported in the literature particularly coming from different sociocultural contexts. Therefore when an evidence based intervention does not produce the required outcomes outside of the research context then the implementation strategy is explored to evaluate the outcomes.

Usually the primary research study gives the details of the method of the study which usually comprise the main implementation strategy. But research being a very costly exercise and also being a luxury for the researchers in the developing countries some of the research may require careful consideration of the methodology of the primary research to adapt to the local context. This is where the implementation fidelity assumes importance. Implementation fidelity is the degree to which the intervention as execute is compatible with the specifications of the implementers of the intervention.

What is Implementation Fidelity of a Project ?

(Bowen et al. 2009, Carrol et al. 2007, Dusenbury et al. 2003, Elliot et al. 2004, Mihalic 2004, Mihalic 2002)

Implementation fidelity is the degree to which a program

is implemented as intended by the program developers.

It is important because implementation fidelity acts as a potential

moderator of the relationship between interventions

and their intended outcomes. It is measured by assessing 5 factors :

1. Adherence

2. Epxosure/Dose

3. Quality of delivery

4. Participant reponsiveness

5. Program differentiation

What is Feasibility of a Project ?

(McLeod 2021)(Bowen et al. 2009, Carrol et al. 2007, Dane and Schneider 1998)

Feasibility evaluates the practicality of the project so that the implementation can be undertaken

without undue concern of failure. Feasibility is a measure of program's potential for success and thus an

important factor in the credibility of the program. Feasibility studies are critical for developing novel

and complex projects. While feasibility as a concept includes among other things efficacy,

legal matters, finances and marketability we will be focusing only on 3 factors in the current project.

They are :

1. Limited efficacy testing

2. Data quality dimensions

2. Program complexity

3. Facilitators of the program delivery

The following measures are usually taken to assess the implementation fidelity of an intervention :

Adherence to an intervention - degree to which the intervention is delivered as designed or written

Exposure or dose - amount of intervention received by the participants OR the frequency and duration of the intervention designers of the intervention wanted and achieved

Quality of delivery - manner in which the research assistant, volunteer or staff member delivers the intervention

Participant responsiveness - degree of engagement of the participants of the program

Program differentiation - component analysis and usage patterns

Limited-efficacy testing : Limited efficacy testing usually refers to a first impression assessment of the tool or intervention for its potential. Thus it is limited in statistical robustness, sampling and methodology yet provide a strong credibility to its ability to deliver the expected outcomes in future research. They are also referred to as pilot studies or proof of concept studies depending on the level of sophistication of the intervention.

(Dusenbury et al. 2003, Dane and Schnider 1998, Mihalic 2004, Bowen et al. 2009)

In the case of PHR implementation studies quality of data collected also assumes much importance as

PHR by nature being a data collection method to realize the benefits of the PHR. Therefore we

added a data quality dimension too for the measures of implementation fidelity.

Data Quality Dimensions of the PHR :

The dimensions are defined below.

Completeness: Is a truth about a patient present in the EHR?

Correctness: Is an element that is present in the EHR true?

Concordance: Is there agreement between elements in the EHR, or between the EHR and another data source?

Plausibility: Does an element in the EHR makes sense in light of other knowledge about what that element is measuring?

Currency: Is an element in the EHR a relevant representation of the patient state at a given point in time?

(Weiskopf and Weng 2013)

REFERENCES

Bowen DJ, Kreuter M, Spring B, Cofta-Woerpel L, Linnan L, Weiner D, Bakken S, Kaplan CP, Squiers L, Fabrizio C, Fernandez M, How We Design Feasibility Studies. Am J Prev Med. 2009 May ; 36(5): 452–457. doi:10.1016/j.amepre.2009.02.002

Carrol C, Patterson M, Wood S, Booth A, Rick J, Balain S. A Conceptual Framework for Implementation Fidelity. Implementation Science 2007;2:40. DOI 10.1186/1748-5908-2-40.

Dane A, Schneider B. Program integrity in primary and early secondary prevention : Are implementation effects out of control. Clin Psychol Rev 1998, 18:23-45.

Dusenbury L, Brannigan R, Falco M, Hansen W: A review of research on fidelity of implementation: Implications for drug abuse prevention in school settings. Health Educ Res 2003,18:237-256.

Elliot D, Mihalic S: Issues in disseminating and replicating effective prevention programs. Prev Sci 2004, 5:47-53.

Mihalic S: The importance of implementation fidelity. Emotional & Behavioral Disorders in Youth 2004, 4:83-86. and 99–105.

Mihalic S: The importance of implementation fidelity. In Blueprints Violence Prevention Initiative Boulder, Colorado; 2002

Weiskop NG and Weng C. Methods and Dimensions of Electronic Health Record data quality assessment : enabling reuse for clinical research. J Am Med Inform Assoc 2013;20:144–151. doi:10.1136/amiajnl-2011-000681