Adaptive Software-based Feedback Acquisition: A Personas-based Design

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Introduction

Users' feedback impact

- **Users' feedback is crucial to improve software quality in general:**
    - It can be used to identify missing features
    - Clarify user trends and preferences for future improvement.
    - Reporting software bugs/problems.
    - Above all, giving users a voice.
- **Users' feedback highly impact the quality and validity of the so-called socially-adaptive software.**
- **According to industrial reports, users' feedback proved to highly impact the overall success of businesses (i.e. Ferret feedback company and its success stories with big brands such as BMW, Asda, Argos, etc)**

(**http://www.feedbackferret.com/**)

Problem

- **Highly variant behaviours of users to feedback acquisition**
  - Different motivations.
  - Different preferences in interaction
  - Different preferences in incentives

- **Lack of engineering approaches to inform the design of feedback acquisition to accommodate these different behaviours**

Aim of the Study

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- **The aim was to :**
- Empirically investigate users' different perspectives and behavioural aspects to feedback acquisition
- Integrate these variations in behaviours in the design of an adaptive feedback acquisition by employing the concept of Persona

Methodology

Methodology

- **Mixed Method approach (sequential-exploratory)**

- **First phase (qualitative):**

  - Interviews with 7 participants

  - Served as a foundation for the second phase

- **Second phase (quantitative):**

  - Questionnaires, 100 participants (BU and overseas participants), Good response rate (100 out of 180)

  - The survey script contained 31 questions discussing and investigating the results of the first phase

  - Improved the quality and generalizability of the first phase results

Methodology

- **Third phase, follow up phase (qualitative):**

  - 4 focus groups (with Middle Eastern and Westerns), 27 participants, further investigation of cultural role on users' behaviour to feedback

- **Personas Creation**

- **PAFA, a Persona-based Method for Adaptive Feedback Acquisition**

Glimpse of previous studies&findings

Participants' characteristics

- **First phase participants:**

Participants	Age	Gender	Education Level	Home Country
P1	19	Male	Undergraduate	UK
P2	29	Male	Postgraduate	Nigeria
P3	24	Female	Postgraduate	Nigeria
P4	19	Female	Undergraduate	KSA
P5	23	Male	Undergraduate	UK
P6	28	Male	Undergraduate	USA
P7	26	Female	Postgraduate	KSA

- **Second phase participants:**

		Age Range					Gender		
		18-25	26-34	35-54	55-64	Total	Male	Female	Total
level of education	High school	3	0	0	0	3	3	0	3
	Bachelor's degree	9	3	6	0	18	13	5	18
	Master's degree	6	36	10	3	55	30	25	55
	Professional degree	0	0	1	1	2	1	1	2
	Doctorate degree	3	11	5	0	19	10	9	19
	Others	0	3	0	0	3	2	1	3
	Total	21	53	22	4	100	59	41	100

Participants' characteristics

- **Third phase participants:**

Participants' Characteristics			
Participant	Age	Gender	Home Country
European Participants			
P1	58	Female	Italian
P2	45	Female	English
P3	22	Male	Polish
P4	71	Male	French
P5	34	Female	Polish
P6	43	Female	French
P7	49	Female	Swiss
P8	39	Male	Sweden
P9	56	Male	Irish
P10	35	Female	Romania
P11	41	Male	UK
P12	27	Female	Polish
P13	19	Male	Sweden
Total	**13 Participants**		
Middle Eastern Participants			
P1	41	Female	KSA
P2	45	Female	KSA
P3	35	Female	KSA
P4	18	Male	KSA
P5	20	Male	KSA
P6	27	Female	KSA
P7	55	Male	KSA
P8	30	Male	KSA
P9	22	Male	KSA
P10	18	Female	KSA
P11	61	Male	KSA
P12	28	Female	KSA
P13	25	Male	KSA
P14	19	Male	KSA

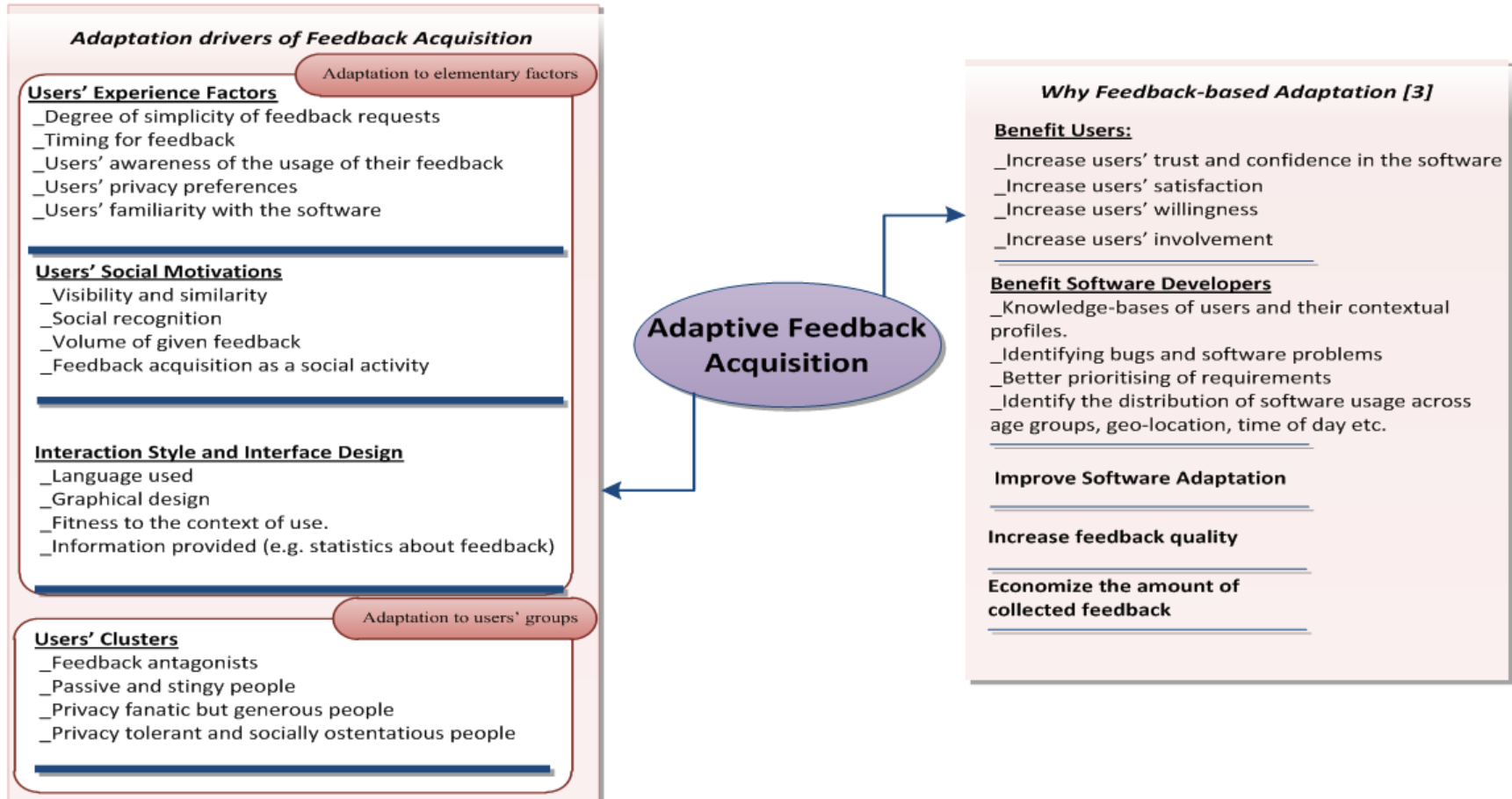# Overview of interviews analysis
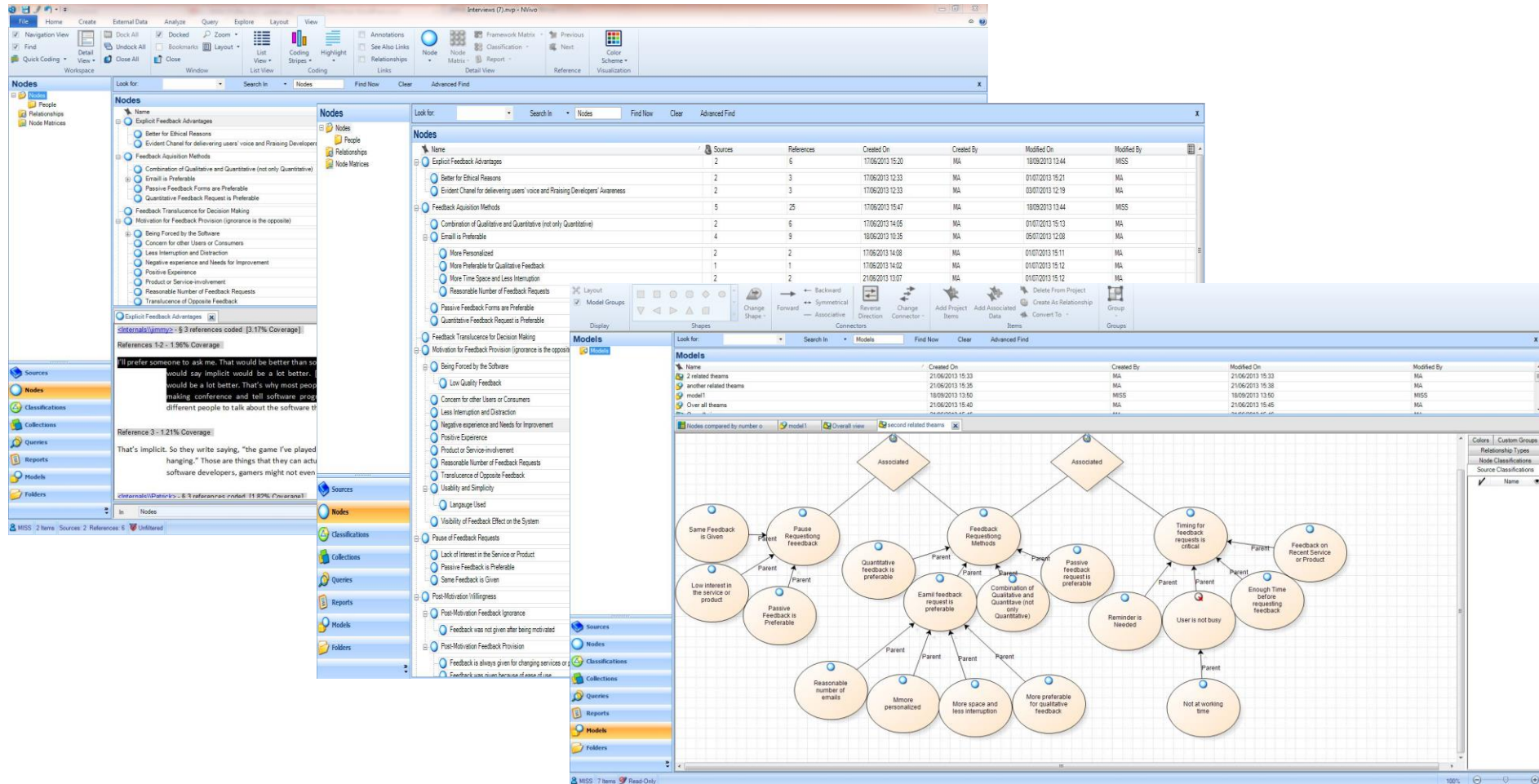
Users Clusters

- **Initial clusters of users' behaviour to feedback acquisition:**

Clusters	N	Likeness to be asked	Method	Explicit/ Implicit	Reminder	Visibility- Willingness increases	Social Activity- interest	Social recognition -willingness increases- impact	Feedback Volume	Feedback Similarity
Cluster 1 (*feedback antagonists)*	38	No	Online		No	No	No	No	No	No
Cluster 2 (*passive and stingy people)*	27	No	Passive		No	No	No	No	No	No
Cluster 3 (*privacy fanatic and* generous people)	21	Yes	Offline	Very Explicit	Yes	Yes_ If able to see others feedback first	No	Yes	Few- increase	50%
Cluster 4 (*privacy tolerant and socially ostentatious people*)	14	No	Hint+ Online	Implicit is also OK	No	Yes_ If able to see others feedback first	Yes	Yes	Large- increase	Similar- increase

Conceptual Framework for Adaptive Feedback Acquisition

Adaptation drivers of Feedback Acquisition

Adaptation to elementary factors

Users' Experience Factors
_Degree of simplicity of feedback requests
_Timing for feedback
_Users' awareness of the usage of their feedback
_Users' privacy preferences
_Users' familiarity with the software

Users' Social Motivations
_Visibility and similarity
_Social recognition
_Volume of given feedback
_Feedback acquisition as a social activity

Interaction Style and Interface Design
_Language used
_Graphical design
_Fitness to the context of use.
_Information provided (e.g. statistics about feedback)

Adaptation to users' groups

Users' Clusters
_Feedback antagonists
_Passive and stingy people
_Privacy fanatic but generous people
_Privacy tolerant and socially ostentatious people

Adaptive Feedback Acquisition

Why Feedback-based Adaptation [3]

Benefit Users:
_Increase users' trust and confidence in the software
_Increase users' satisfaction
_Increase users' willingness
_Increase users' involvement

Benefit Software Developers
_Knowledge-bases of users and their contextual profiles.
_Identifying bugs and software problems
_Better prioritising of requirements
_Identify the distribution of software usage across age groups, geo-location, time of day etc.

Improve Software Adaptation

Increase feedback quality

Economize the amount of collected feedback

Conceptual Framework for an adaptive acquisition of users' feedback.

- ## **Publication:**

- **Almaliki, M., Faniyi, F., Bahsoon, R., Phalp, K. and Ali, R., 2014. Requirements- driven Social Adaptation: Expert Survey. In the 19th working conference on Requirement Engineering Foundation for Software Quality (REFSQ'14).**

- **Almaliki, M.,C.Ncube and Ali, R., 2014. The Design of Adaptive Acquisition of Users Feedback: an Empirical Study. In the IEEE 8th International Conference on Research Challenges in Information Science (RCIS'14).**

- **Almaliki, M., Jiang, N., Ali, R. and Dalpiaz, F., 2014. Gamified Culture-aware Feedback Acquisition. In: The 2nd International Workshop on Crowdsourcing and Gamification in the Cloud (CGCloud 2014), Co-located with UCC 2014. 8 December 2014 London, UK**

Personas

Definition and role

- **Personas as interactive design tool are fictional characters that represent different types of users and their behaviours based on data gathered from ethnographic and empirical analysis of actual users (Cooper 1999).**
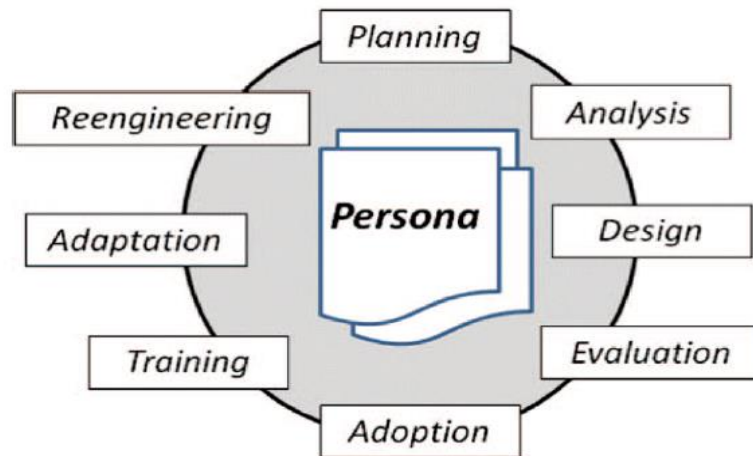
The role of a persona throughout the design phase of software (Seffah et al. 2009).
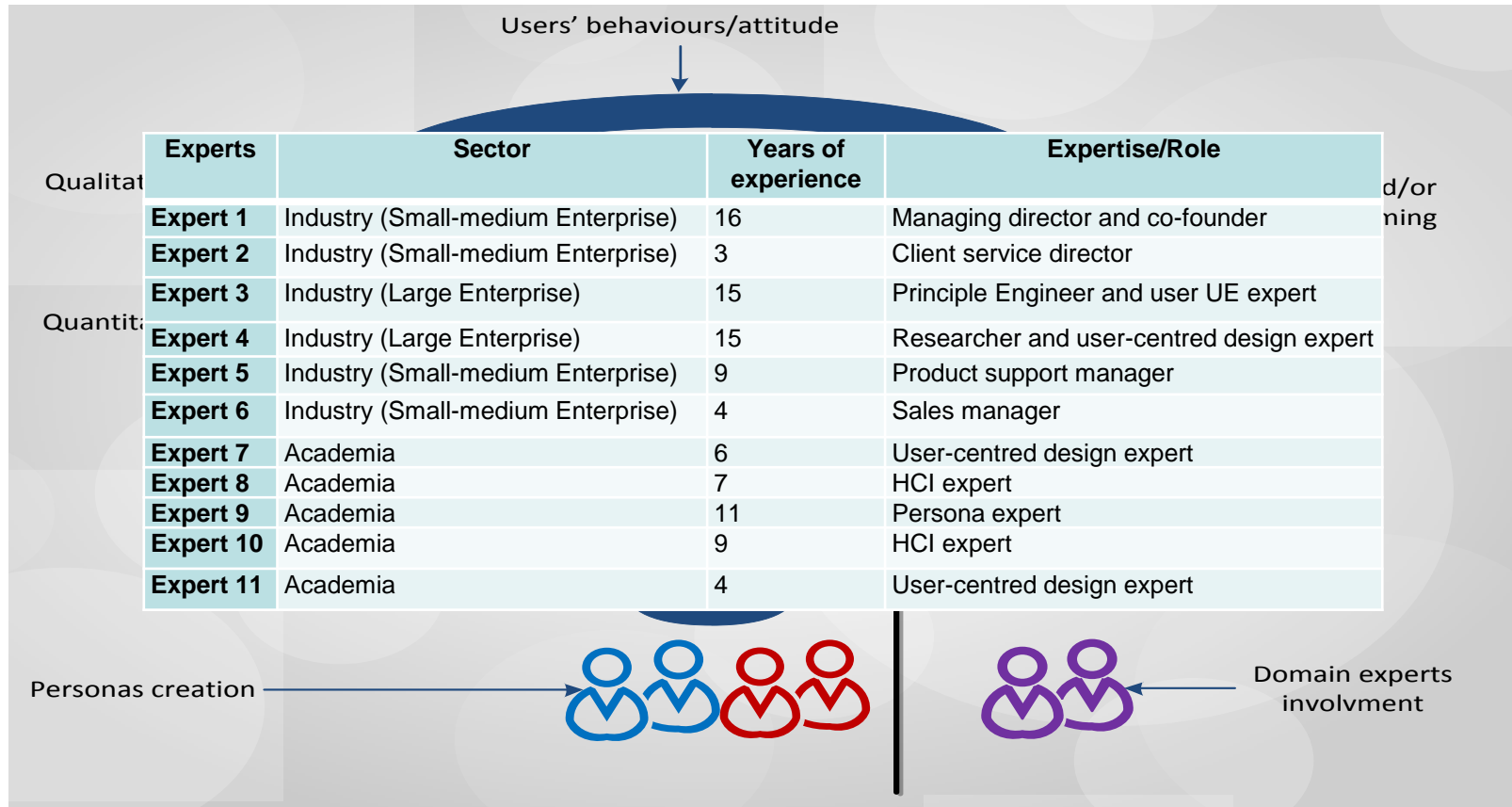
Why Personas?

- **An easier design process by relating to human face and name instead of abstract user/customer data.**

- **Shared, fast and effective form of communication.**

- **Limitation of stakeholders' ability to shape users to their convenience.**

- **keeping the focus on the limited subset of users (persona) at a time which can result in more robust design decisions.**

- **Software/product validation tool in which proposed designs are reviewed against the needs described by an individual persona.**

Personas creation

Experts	Sector	Years of experience	Expertise/Role
Expert 1	Industry (Small-medium Enterprise)	16	Managing director and co-founder
Expert 2	Industry (Small-medium Enterprise)	3	Client service director
Expert 3	Industry (Large Enterprise)	15	Principle Engineer and user UE expert
Expert 4	Industry (Large Enterprise)	15	Researcher and user-centred design expert
Expert 5	Industry (Small-medium Enterprise)	9	Product support manager
Expert 6	Industry (Small-medium Enterprise)	4	Sales manager
Expert 7	Academia	6	User-centred design expert
Expert 8	Academia	7	HCI expert
Expert 9	Academia	11	Persona expert
Expert 10	Academia	9	HCI expert
Expert 11	Academia	4	User-centred design expert

Visual view of the persona creation approach used within this research (adapted from Mulder and Yaar 2006)

Personas Components

components	Description
Identity	includes a short statement/status describing the overall persona's attitude to feedback acquisition (i.e. anti-user of the application)
Profile (fictional)	Includes the first name and a picture of the persona. It also includes a description of basic demographic information such as age group, gender, profession, etc. *Note: in this work, fictional information is only meant to bring life to the persona and make it memorable and should not impact the design of the feedback acquisition.*
Goals	Indicates persona's goals of responding to feedback requests in software applications.
Behaviour	Describes persona's behaviour and attitude to feedback acquisition.
Culture Suitability	Indicates the persona's suitability to a certain culture. *Note: culture suitability doesn't restrict a persona to a certain culture. It just gives a slight and initial indication of its potential suitability to that culture. We mainly studied the difference between western and middle eastern only.*

Persona components used within this research (adapted from Courage and Baxter 2005)

Linda&Jack

Linda

Profile: Privacy tolerant and socially ostentatious
Age: 20
Gender: Female
Job: Undergraduate student
Socially affected to give feedback: Yes
Culture Suitability: Middle Eastern-like

Statement: *"Giving feedback is a social and community experience and it helps to feel among others".*
Goals: Impact the software with her feedback + raising others awareness about the used software + being socially recognised.

Behaviour to feedback:
Linda is an undergraduate university student and spends a great deal of time on her computer studying as well as heavily social networking (i.e. Facebooking). **[Discouragement]** In general, she is not a big fan of the idea of dull and typical feedback requests and reminders coming from software applications. **[Motivation]** However, she gets interested in replying to feedback requests when the feedback requests socially motivate her to do so (i.e. by making her socially recognized for her helpful feedback). This is perhaps due to her likeness of social networking and the time she spends socialising with others/friends on the internes which made her motivated towards socially enriched feedback requests. Generally, Linda is positively affected by one or more of the following social factors to give feedback:

- **Volume of already given feedback:** She gets enthusiastic to give feedback when there is low number of feedbacks already given on a software. She believes it's helpful to increase the number of given feedback which will then result in other users having a better and richer idea about the software.
- **Visibility and similarity of other users' feedback:** Linda also gets more interested to give feedback if she is able to see other users' feedback on the software first and then having the option to accept/reject to give feedback.
- **Social recognition:** Since Linda appreciates social networking and gives it a great deal of her time, she likes to be socially recognized for her given feedback which she believes could help others and make her socially popular.
- **Feedback acquisition as a social activity:** This social factor also makes Linda motivated to give feedback as well as engaging with software. For example, she gets enthusiastic to feedback requests when she is able to visualize how her social friends are rating a certain software and how their feedback influenced the trend in her community.

[Method] In addition, Linda prefers to be approached for feedback by using hints and tips to gather her feedback (e.g. by telling her that she can go to a feedback centre for this purpose and leave her feedback) or by using an online method as a second option (i.e. popups while she is using the software). **[Privacy]** Interestingly, Linda does not mind to be implicitly reached for feedback (e.g. implicitly collecting information about her software usage)

Jack

Profile: Privacy fanatic and generous
Age: 35
Gender: Male
Job: Researcher
Socially affected to give feedback: Yes
Culture Suitability: Middle Eastern-like

Statement: *"I think emails are good if you want someone to actually sit down and write a couple of sentences about how they feel about your service popups and other 'push' mechanisms intrude & interrupt flow."*

Goals: Impact the software with his feedback + raising others awareness about the used software + being socially recognised.

Behaviour to feedback:

Jack as a researcher spends most of his time on the computer working on his research as well as networking with other researchers. **[Motivation]** Jack believes in the power feedback in general and its positive impact. He is a very positive person towards feedback requests and reminders coming from software application.
[Method] However, he prefers to be asked for feedback in an offline way (i.e. through emails or text messages).
[Discouragement] He believes online feedback request (i.e. popups) could somehow be intruding and interrupting especially when he is working on his research and deeply thinking.
[Privacy] In addition, Jack is always concerned about his privacy and therefore he does not accept to implicitly collect feedback from him (i.e. tracking his usage of the software). **[Motivation]** In addition, Jack is a socially motivated feedback provider and his willingness to give feedback is positively influenced by one or more of the following social factors:

- **Social recognition:** He likes to be socially recognized for his valuable and trustworthy feedback which he believes could help others and raise the social awareness about the software in use.
- **Volume of already given feedback:** He gets enthusiastic to give feedback when there is high number of feedbacks already given on a software. This means to jack the software is popular and deserves his feedback.
- **Visibility of other users' feedback:** Jack also gets more interested to give feedback if he is able to see other users' feedback on the software first and then having the option to accept/reject to give feedback.

Mark&Richard

Mark

Profile: Passive and stingy
Age: 50
Gender: Male
Job: Business man
Socially affected to give feedback: No
Culture Suitability: Neutral

Statement: "*I find it problematic, hindering and unprofessional to send me any kind of feedback requests. If I'm not happy with something I will go to their website and complain right to them*".
Goals: Get my voice heard when I need.

Behaviour to feedback:

Mark is a business man and he spends a lot of time on his computer working on his business. He holds a very negative view about feedback request coming from software applications. He does not have the time to be responding to feedback request due to his heavy workload.

[Discouragement] Mark thinks feedback request coming from software applications can waste his time and he doesn't tolerate to be asked for feedback at all (whether it's online of offline feedback request). In fact, he thinks that feedback requests that interrupt him while he is working are an impolite way to get information out of him. Since Mark doesn't tolerate to be asked for feedback at the first place, he is not affected by any social factors to give feedback at all (i.e. social recognition does not make him happy to give feedback).

[Method and Motivation] However, Mark believes that there should be a channel for him to deliver his opinion whenever he likes by making him able to submit his feedback on a voluntarily base and without being proactively asked by the software (i.e. through a contact us form).

Richard

Profile: Loyal and passionate
Age: 18
Gender: Male
Job: High school student
Culture Suitability: Neutral

Statement: *"If I'm passionate about something, can't stand negative reviews about it. I would always defend it. As simple as that"*

Goal: To feel better when defending and praising what he is passionate about.

Behaviour to feedback:

Richard is a high school student and he is highly passionate about his new smartphone. His passion makes him blind to any drawbacks of his smartphone. He is not a big fan of the idea of being asked for/reminded to give feedbacks by software applications.

[Method] However, when it comes to something he loves he happily respond with a positive input regardless of the way he is being asked for the feedback (i.e. offline or real-time)

[Motivation] The main motivation that drives Richard willingness to give feedback is his passion and loyalty about certain product/software. [concerns] However, the quality of his feedback can be questionable since he tends to exaggerate in praising and defending what he loves.

Sara, Hana and Amy

Sara

Profile: Incentive Seeker
Age: 28
Gender: Female
Job: Supermarket cashier
Culture Suitability: Neutral

Statement: *"what's for me in it?, In fact, I wonder why would people give feedback for free?"*

Goal: To win tangible incentives.

Behaviour to feedback:

Sara is a supermarket cashier and she highly believes in tangibly rewarding customers for their loyalty (i.e. customers win a free product after certain visits to the supermarket). She thinks the same applies to feedback request coming from software applications.

[Motivation] She argues that her the effort and time she spends giving feedback should be tangibly rewarded.

[Method] As long as there is an incentive, she is happy to respond to feedback requests regardless of the way she is being asked for the feedback (i.e. offline or real-time method).

[Concerns] However her response would be mostly positive and not well thought. This is due to her desire to get the incentive no matter how the feedback she gives looks like. This can have a negative effect on overall reputation of the software/product due to the low quality feedback that doesn't objectively represent her experience.

Hana

Profile: Perfectionist/complainer
Age: 24
Gender: Female
Job: Hotel receptionist
Culture Suitability: Neutral

Statement: *"I'm perfectionist and I always seek perfection, If I tiny thing is wrong then of course I will speak"*

Goal: To express her disappointment and sometimes ability to criticise+ seeking perfection.

Behaviour to feedback:

Hana is a hotel receptionist and her job requires her to seek perfection due to the size of criticism she receives from the hotel guests.

[Method] She wouldn't mind to be asked for feedback by software applications and she would always reply but mostly with a negative response regardless of the way she is being asked for feedback (i.e. offline or real-time method). She is a very picky person and never get satisfied no matter how good is the provided software/service.

[Motivation] The main motivation that drives Hana willingness to give feedback is her desire to achieve perfection and her ability to criticise any thing.

[Concerns] However, the quality of her feedback can be questionable since she tends to exaggerate in criticism which could eventually result in an exaggerated harm to the software/product.

Amy

Profile: Impact seeker
Age: 29
Gender: Female
Job: School teacher
Socially affected to give feedback: No
Culture Suitability: Slightly Western-like

Statement: *"The benefits of my feedback are always not clear to me as a user."*

Goal: To consider her feedback and see the impact of it on the software.

Behaviour to feedback:

Amy is a school teacher and spends a great deal of time on the internet reading and researching educational related topics. She is not a big fan of the idea of being asked for/reminded to give feedbacks by software applications.

[Discouragement] She does not believe her given feedback is going to be considered or lead to any changes/improvements on the software. She does not even get influenced or motivated by any social factors to give feedback (i.e. visibility of others feedback on the software doesn't really make her want to give feedback).

[Method] However, sometimes she can be tolerant to online feedback request (i.e. showing her a feedback popup dialogue while she is using the software).

[Discouragement] This is due to the fact that she doesn't accept the idea of having her email inbox filled with feedback requests or feedback reminders.

[Motivation] She tolerates the online ones since she has the control to respond or dismiss it at only one click sometimes. In conclusion, Amy can act more positively to feedback request if her feedback is considered and she can see its impact on the software.

PAFA; a **P**ersona-based Method for **A**daptive **F**eedback **A**cquisition
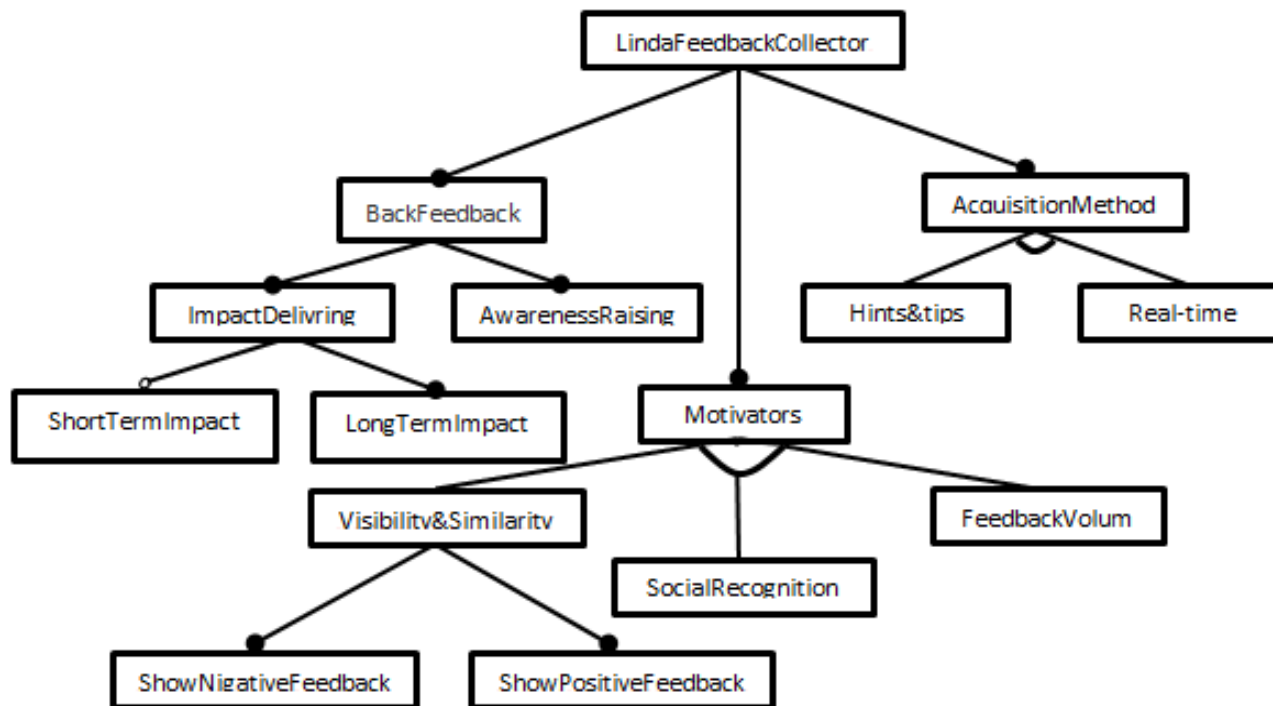
Conclusion

- This work provides a clearer view and a deeper understanding of users' different behaviours to feedback acquisition represented in seven personas of users' behaviour to feedback acquisition.

- This highlights the need for an adaptive feedback acquisition to cater for these various behaviours.

- Additionally, this work gives a clear view on how the introduced personas can benefit software engineers when designing an adaptive feedback acquisition.

- PAFA method was also introduced to adopt the proposed personas to inform the design of an adaptive feedback acquisition.

Future work

- **Elaboration on the PAFA method and applying it on case studies aiming to refine it more and propose tools to support it.**

- **Further investigation of PAFA's novel techniques such as the staged configuration and personality questions.**

Acknowledgement

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Current industrial collaboration

Feedback?