

Domain



Motivation

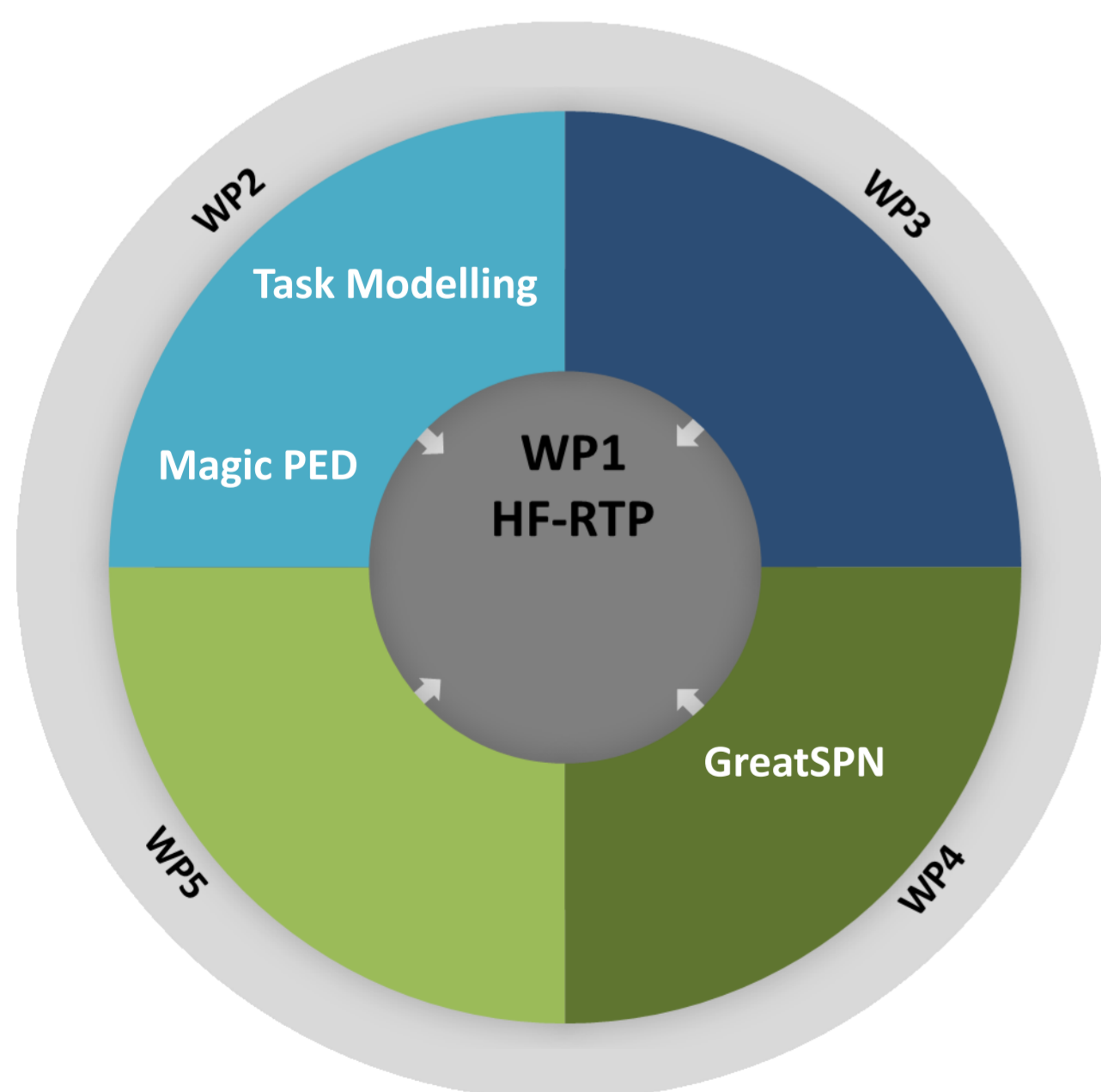
The objective of this AdCoS is to ease the collaboration between the different actors and systems that compose a laboratory in a medical environment (proper assignment of tasks, manage real time instructions (alarms, checkpoints, reminders), optimise the workflow and cooperation among operators, etc.).



One of the main problems older adults and newcomers face at work is the adaptation to a changeable working environment, which comes from many factors: new computer and machine interfaces, new devices, new procedures and workflow, new business line and markets, etc.

An incorrect entering of changes in the working environment can cause a wrong understanding of concepts as well as demotivation and low productivity, especially in older employees. Furthermore, it can lead to user errors, which can put patients at risk.

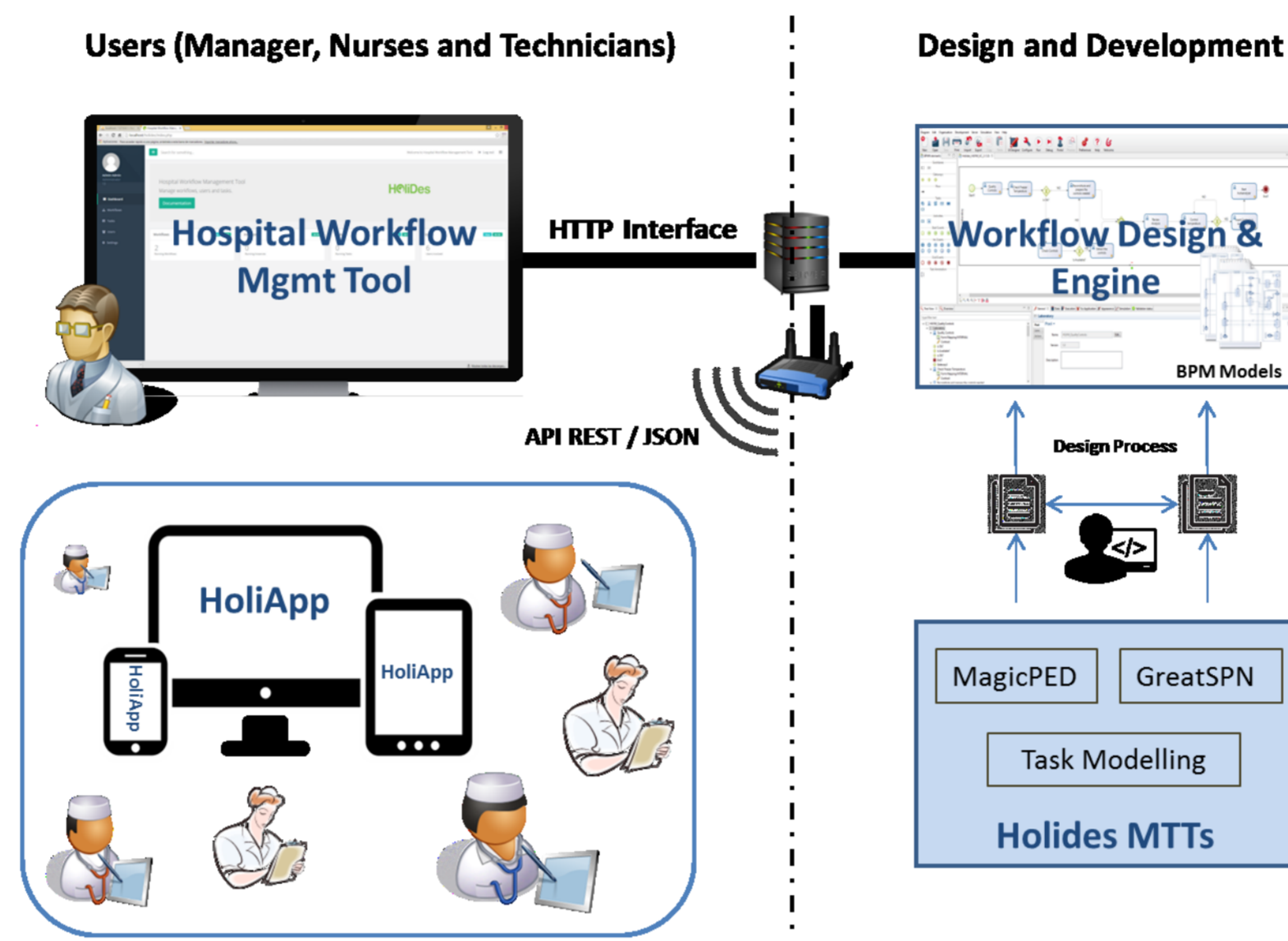
Applied MTTs



Final Development

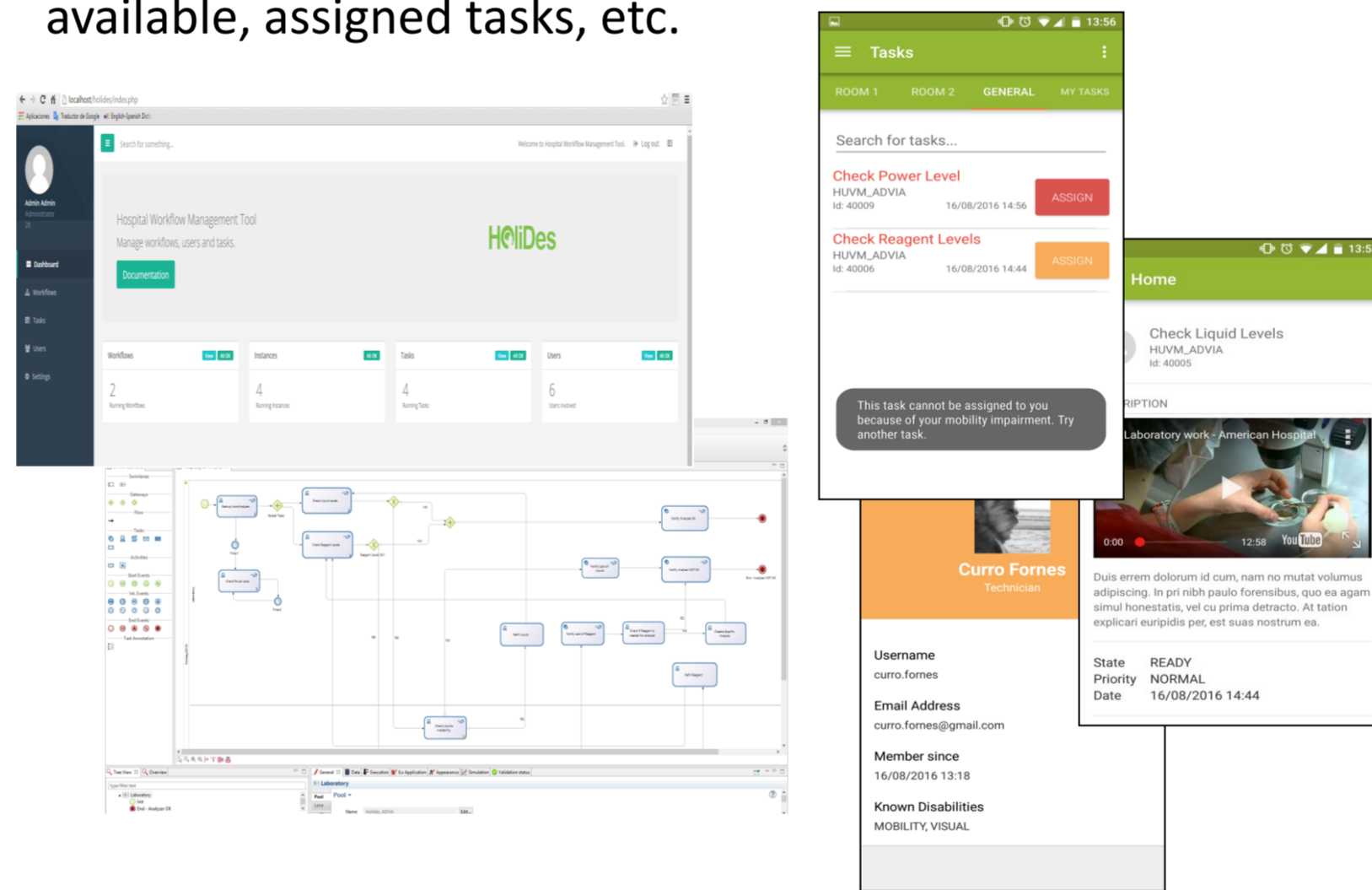
The AdCoS eases the development of a workflow solution for hospitals focusing on the following aspects:

- Helping to proper staff **assignment** to tasks.
- Providing **real time instructions** – trigger alarms – reminders and check points.
- Optimizing the workflow and **cooperation** with the rest of operators.



The AdCoS use case is made up mainly of three parts:

- **Workflow Engine:** This tool is in charge of processing the instructions, decision making and interacting with the real device that implements the prototype mobile application.
- **Management Tool:** tool where the workflows and users are managed by instructors or managers.
- **Client application:** application where the workflow and alarm information is shown in real time to the operators, e.g. available tasks to be performed, alert about new task available, assigned tasks, etc.



Several HoliDes methods and tools (GreatSPN, HEE, task modelling approach, MagicPED, RTMaps...), initially selected as the candidates for accomplishing the use case, were analysed indicating which of them covered most of our requirements based on the steps of the AdCoS design and development process (requirements, design, simulator and prototype development and prototype validation).

GreatSPN, MagicPED and Task Modelling have been used to design, validate and optimize the workflows models that later are implemented in the on the Workflow engine.

Evaluation

The prototype helps us to pre-validate the implementation of a AdCoS System, before the full implementation on a real hospital is carried out. From developers perspective, we estimated a reduction of development cost of these system higher than 11%.

For the evaluation, three performance indicators have been selected:

- **Number of task performed:** increase of the number of tasks performed by the operator in a workday.
- **Error in daily task:** this indicator expresses the number error-prone activities.
- **User Interface:** It describes level of acceptance about the GUIs, task instructions and their ease of use.

Note that this AdCoS was engineered and purpose-built from the ground up, so the logic and the GUIs have been developed during the project. It has been tested in laboratory environment, achieving TRL4

Performance Indicator (PI)	Estimation
Task performed	Increment 25 %
Error daily task	Reduced 20 %
User Interface	Acceptance of 90%

These performance indicators have been evaluated by users as source of information using testing and questionnaires in a laboratory environment.

USEFULNESS	1	2	3	4	5	6	7	NA
1. It helps me be more effective	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. It helps me be more productive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. It is useful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. It gives me more control over the activities in my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. It makes the things I want to accomplish easier to get done	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. It lets me use time when I use it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. It saves me energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. It does everything I would expect it to do	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. It is easy to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. It is simple to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. It is user friendly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. It requires the fewest steps possible to accomplish what I want to do with it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. It is flexible	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Using it is effortless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I can use it without needing instructions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I don't notice any inaccuracies as I use it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Both experienced and beginner users would like it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I can recover from mistakes quickly and easily	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I can use it immediately every time	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. I learned to use it quickly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. I rarely remember how to use it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. It is easy to learn to use it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. I quickly become skilled with it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. I can attend to it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. I would recommend it to a friend	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. It is fun to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. It works the way I want it to work	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. It is wonderful	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. I feel I need to have it	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. It is addictive to use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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