The PEPPER System Application Program Interface

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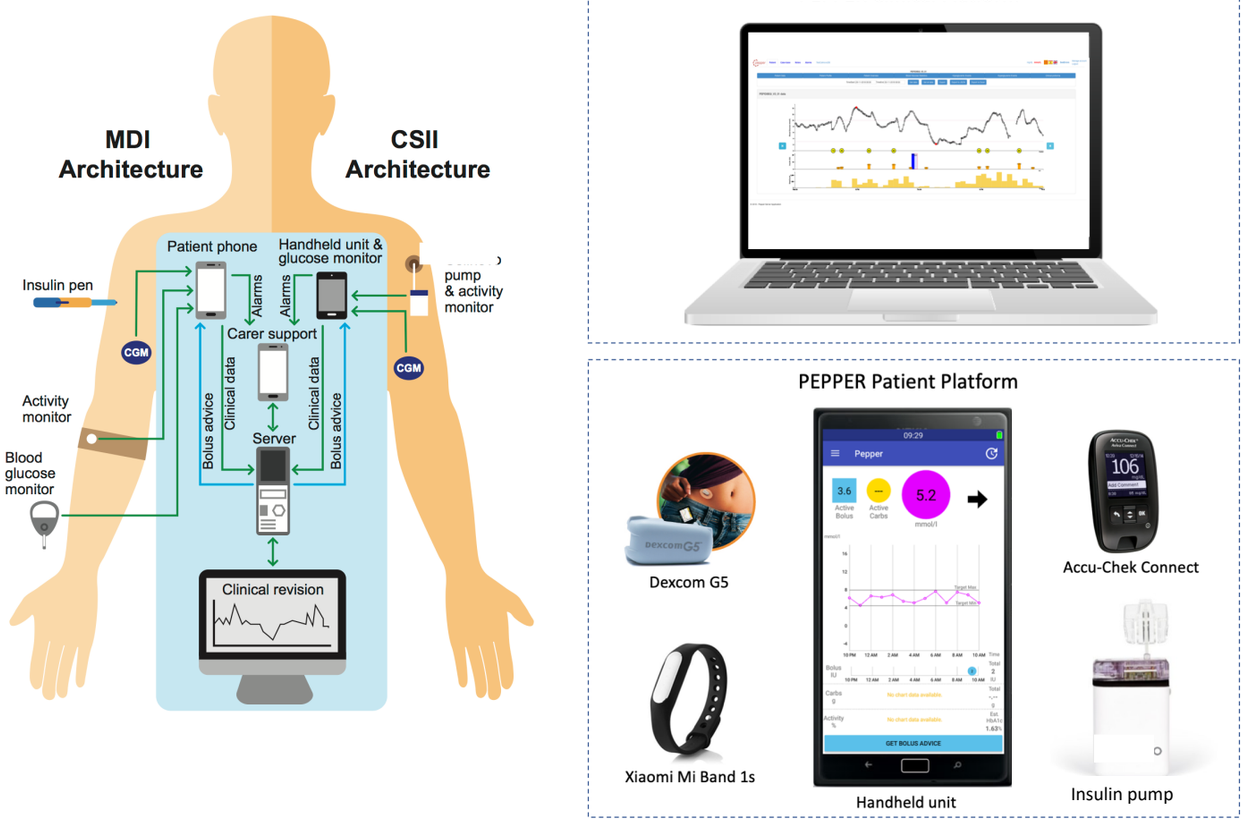
Background and Aims

- PEPPER (Patient Empowerment through Predictive PERsonalised decision support) is an EU-funded H2020 project that provides a personalized decision support system for type 1 diabetes self-management [1]. (http://www.pepper.eu.com/)
- The PEPPER system includes an AI-powered insulin dose recommender [2] and a safety system comprised of different modules (predictive glucose alerts, predictive low-glucose suspend, carbohydrate recommender, dynamic insulin constraint) [3].
- PEPPER offers a dual architecture to cater for both insulin injections and insulin pump treatments.
- Users wear a real-time continuous glucose monitoring and an activity monitor that communicates to the handheld device.
- The handheld unit communicates to a secure web server that enables remote clinical supervision.



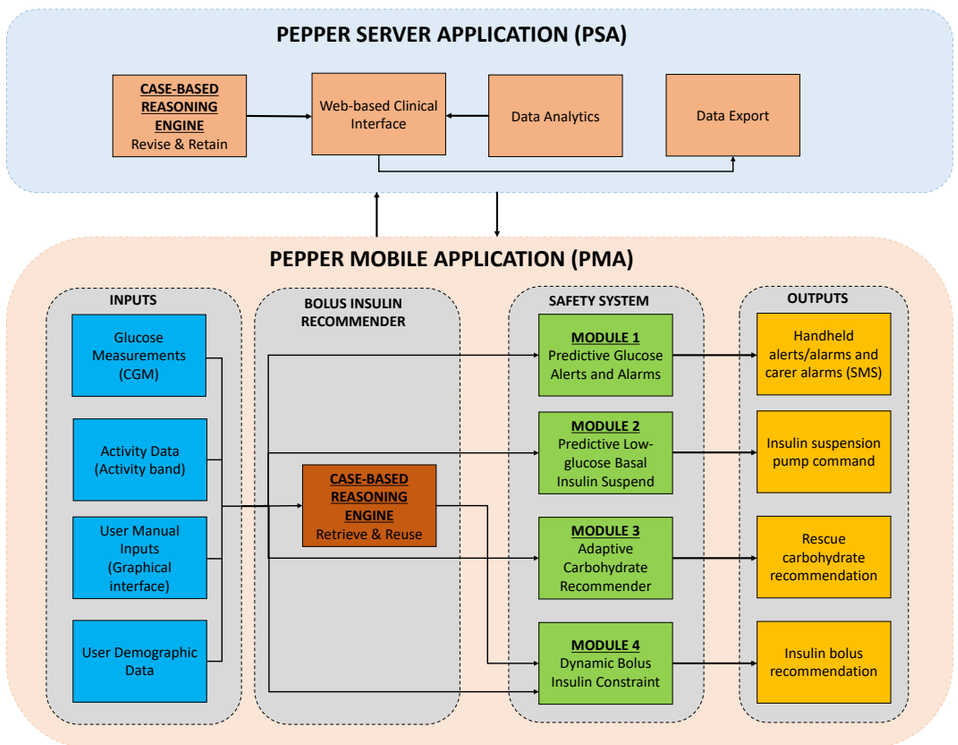
Left) PEPPER system MDI and CSII architectures and Right) PEPPER system components

- PEPPER complies with all medical software standards (IEC62304, IEC62366, SnomedCT, and HL7) and has been evaluated through a randomised cross-over clinical study.
- Although PEPPER was designed to be used as a whole, it is also possible to use its multiple individual components in an independent way.
- This work describes the application program interface (API) developed for this purpose.

Methods

- The PEPPER API comprises four individual APIs and a system architecture defining their interoperability:
  1. insulin dose recommender
  2. safety system
  3. handset graphical user interface
  4. web interface (backend and frontend)

- All APIs are developed in JAVA but the web interface API which is developed in C#.
- All APIs use a JSON messaging system for communication between handset and server.



Block diagram of the PEPPER system modular architecture

Results

- The PEPPER API is currently available under different licensing agreements and its documentation can be freely accessed online.

www.pepper.eu.com/API

Conclusion

- The PEPPER API provides a convenient way to integrate a variety of software modules into an insulin decision support system or artificial pancreas.
- The algorithms have been shown to work together, without conflict, in the PEPPER system, which has been clinically evaluated.

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References

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