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**Reference: QSE:CIS\_Crowdsourcing**

**Topic: Collective Intelligence System Architectures to reinvent Crowdworker Self-Organization and Improvement of Crowdsourcing Systems**

LVA-Type: Bachelor's / Master's Thesis, (MSc) Project in SE and Internet Comp.

Start: As soon as possible

End: By arrangement

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## Background

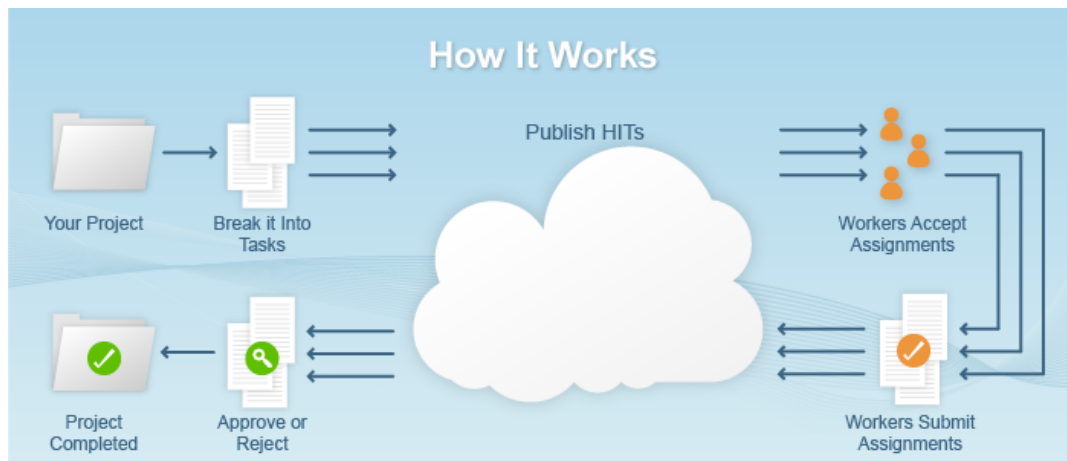


Fig 1: Overview of Crowdsourcing Process on Amazon Mechanical Turk.

*Collective Intelligence Systems* (CIS) like Twitter, Wikipedia or Stackoverflow, are one type of crowd-powered systems and have a strongly influence on nowadays knowledge creation, information sharing and dissemination processes.

Another type of crowd-powered systems are *Crowdsourcing* platforms that have seen widespread adoption in the last decade as an efficient way of outsourcing micro tasks. Crowdsourcing is the concept (Fig 1.) of outsourcing an activity of an employee to an external crowd. In detail, *requesters* use a dedicated crowdsourcing platform (i.e. Amazon Mechanical Turk [1], Crowdfunder [2]) to post *tasks*, which can then be performed by users, called *workers*. Once the task is completed and the requester accepts the result, the worker gets *paid*.

Although the mechanism has proven sustainable on the requester side, recent results [3] indicate that the workers still face major challenges like poor awareness about a requester's trustworthiness, the cost-effort effectiveness of tasks or the platform's adherence to regulations.

In order to support workers of crowdsourcing platforms with these limitations together with other stakeholders (developers, workers unions, etc.), novel types of CIS designs should be systematically explored, implemented or reviewed, which target aforementioned limitations. Current research [4] has already shown that workers do not exclusively rely on the

crowdsourcing platform, but also on a shadow ecosystem of other platforms as essential drivers of their information sharing and work organization processes.

In this work the student learns mechanisms of crowdsourcing systems and collective intelligence systems and, depending of the scope/size of the work, current software architectural design methods (in particular in multi-stakeholder settings), agile software development methods, social web platform development with state-of-the art technology stacks and systematic research methods.

The scope of the work is negotiable depending on the LVA-Type (Bachelor's/Master's thesis, project in SE).

## Tasks

- Goal is the exploration, design, technical planning and development of Collective Intelligence Systems for the Crowdsourcing domain.
- Basic parts include:
  - o Exploration and modeling of concept solution candidates.
  - o Design and documentation of prototype architecture.
  - o Implementation of a prototype using Ruby on Rails and additional frameworks.
  - o Testing and quality assurance of the created solution for collective intelligence effectiveness.

## Experience and skills needed

- Ruby on Rails
- Basic experiences in data modelling and databases (e.g. MySQL, PostgreSQL).
- Basic experiences in software architecture and documentation methods (e.g., UML, BPMN).
- Experience / interest in Social Web, Crowdsourcing, Collective Intelligence and Social Networks.
- Good written and spoken English skills.
- Experience with Git.

Please also find background information on SE and CIS at: <http://qse.ifs.tuwien.ac.at/ci/>

## Links

[1] Amazon Mechanical Turk. <https://www.mturk.com>

[2] Crowdfunder. <https://www.crowdfunder.com>

[3] Huws, U. Crowd Work in Austria.  
[https://media.arbeiterkammer.at/wien/PDF/varueckblicke/Praesentation\\_Ursula\\_Huws.pdf](https://media.arbeiterkammer.at/wien/PDF/varueckblicke/Praesentation_Ursula_Huws.pdf)

[4] Suri, Siddharth; et al. The Crowd is a Collaborative Network. CSCW. 2016.  
<https://www.microsoft.com/en-us/research/publication/the-crowd-is-a-collaborative-network/>