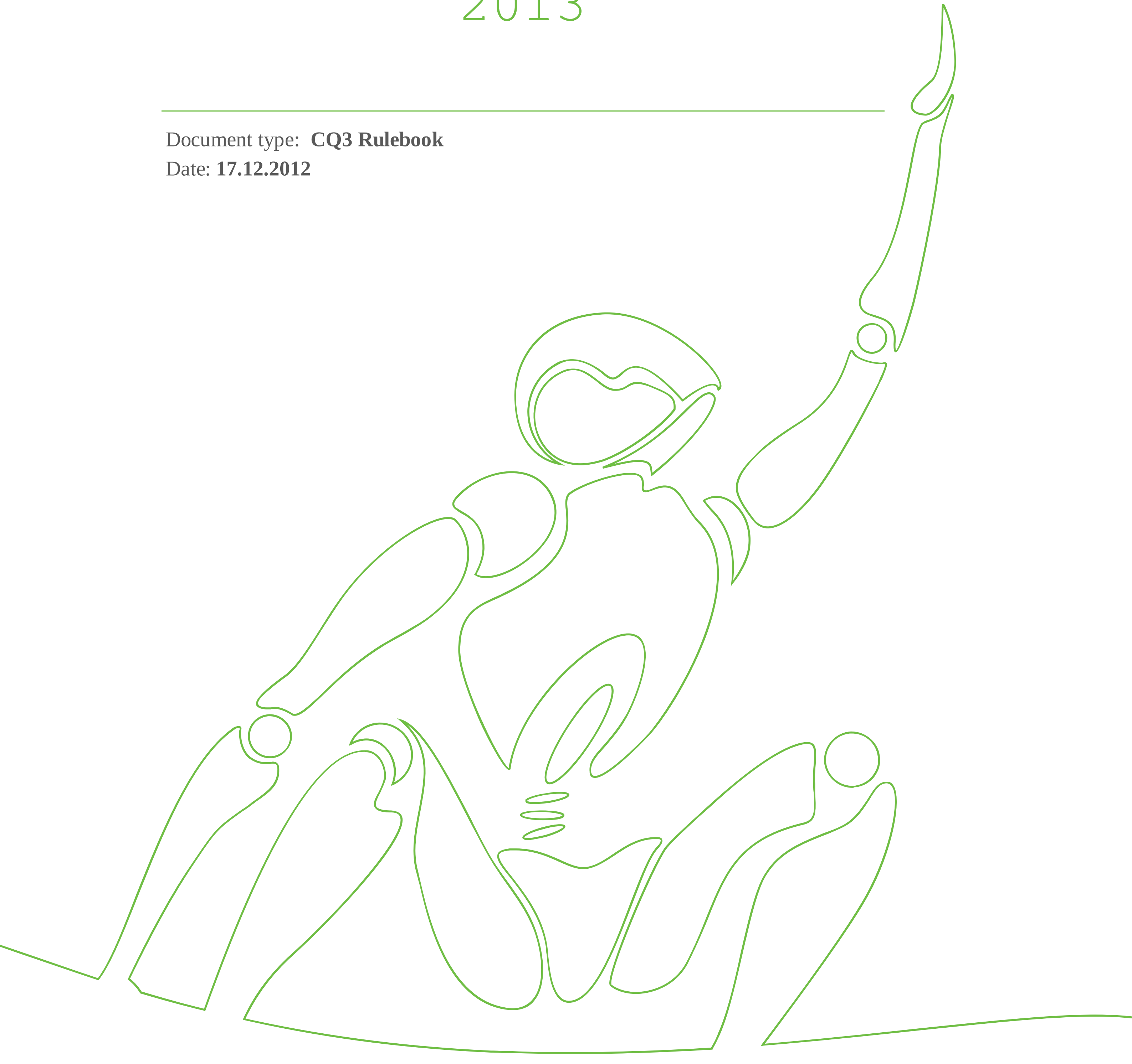
AI-MAS Winter Olympics 2013

Document type: **CQ3 Rulebook**

Date: **17.12.2012**



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Introduction

This document specifies the rules for the Crafting Quest 3 game. For more technical details please read the SDK documentation and getting started tutorial.

Game Overview

Goal of the game

Crafting Quest 3 is a multiplayer turn-based strategy game. In order to win, a player needs to have the most points at the end of the game. Points are gained by destroying enemy units, picking up resources and crafting items. Each player controls a scenario dependent number of units, that can move on a map, and competes against one or more opposing players. In order to interact with other units and the environment, each unit has a series of actions that it can perform, covered in-depth in the *Unit stats*, *Actions* and *Crafting* subsections. The player with the most points at the end of the game wins.

Initial game status

All units are placed on the map at the beginning of the game. The maps are symmetrical, such that no player gains an advantage over the other with respect to unit positioning. Each player will receive the dimensions of the map and the positions of his units at the beginning of the game.

Game progress

All Scenario dependent parameters (map dimensions, maximum number of turns, blueprint features) will be known when a game instance is created.
The game is turn based and ends after a specified number of turns. A turn has a given time limit of 1000 ms during which the player can submit as many action requests as possible, given the current energy levels of his units. The response to an action request is immediate within the player’s turn time frame and reveals the new state of the unit that performed the action: the information in the neighboring cells and information referring to the unit. Players get notifications each turn as to how many rounds are left and energy related information. Once the time limit is up, the server automatically pauses the client and restarts it once the opponent's turn has ended. There is no condition regarding how many energy points must be used each turn.

Victory condition: gather more points than any of your opponents in the allotted time (number of turns) or defeat all opponents.

Map

The map's layout is scenario dependent: players do not have any prior knowledge regarding map characteristics. The map has a rectangular shape and is composed of square cells. Each cell has two unique identifiers - the line number and the column number - starting from 0. The maps have a minimum width/height of 50 cells and a maximum of 100.

Terrain

The map cells can have one of the following two types: Grass or Rock. All units can pass through Grass; no units can pass through Rocks.

Resources

Resources are used to build objects and craft items, and are not shared between units in the same team. Each resource has a unique name and type. Resources can be found in map cells buried - and not visible - or at the surface - and visible - (see the Dig, Drop and View subsections in the Actions section). Initially, all resources are buried. Cells can contain any number of buried resources of any type.

The resources will not be uniformly dispersed over the entire map. Rather, there will be regions on the map that will be abundant in a specific type of resource, whereas other regions may contain no resources at all. Resources will not appear over inaccessible terrain (the Rock terrain type).

Unit

This section specificies unit statistics and available actions.

Stats

A unit is defined through two stats: the current energy level and the max energy level.

Current energy level The actions of a unit are restricted by the energy it has. Energy points cannot be shared between units and the energy of each unit is replenished logarithmically towards the maximum possible value at the beginning of each turn. All actions have an associated energy requirement and the current energy value is decreased every time the unit performs an action. The unit can only execute an action if its energy meets the action's requirements (see Actions).

Max energy level This is the maximum energy value that the unit can have. This maximum value is configured in the game scenario. The maximum energy value is decreased whenever the unit is hit by an attack. Should this value go below 0, the unit is considered out of action and will be removed from the Game.

Actions

This section describes the actions available to all units. Some actions have an energy requirement and some actions may yield better results if the energy expended to perform them exceeds the requirements.

Move A unit can request a move in any adjacent cell to the one it finds itself in. Each movement action will cost a quantity of energy which can be increased by the presence of defense towers and the weight of carried items. Units cannot move to cells containing a defense tower or another unit. If a unit moves to a cell containing a trap (see *Crafted Items* for details) its current energy is reduced to zero and the movement is stopped.

Attack All units are capable of attacking and destroying enemy units. When two opposing units are in adjacent cells, either unit can decide to attack the other. The effectiveness of an attack is determined by the energy invested into taking this action and is increased by the equipped weapon, if any. Moreover, the damage done is modulated by the adversary's equipped armor, if any. By being able to see what equipment and energy an enemy unit has, your unit could decide whether an attack is a good decision or not. Damage is equal to *energy_expended * (1 + attacking_unit_attack_bonus) * (1 - defending_unit_defense_bonus)*. If there is no weapon or defense item equipped the corresponding bonus is 0.

Retaliate Each unit is able to retaliate against any attack that it is the target of. In order to do this, the player must set the energy value to retaliate with and the energy cutoff value (the maximum energy value to spend on retaliatory actions).

Dig When in a cell, a unit can opt to perform a dig action to discover the resource contents of the cell. At this point, all resources in the cell become known to the unit performing the action. The dig action is solely informational. It does not add any resources to those carried by a unit, nor does it make the resources visible to other units. The dig action has an energy cost.

Pickup A unit can choose to pick up any of the buried or visible resources/items in a cell. Units do not need to dig for resources before picking them up, however, they do still need information about the type and quantity of resources available; this information may be acquired by clever use of the view action. A unit must specify pairings of the form <resource type, quantity> / <item type, quantity> for the item(s) it wants to pick up. The pickup action has an energy cost.

Drop A unit may not be able to move if it is carrying enough resources and/or items as to exceed its carry weight limit, or, it may wish to make more room for another type of resource. A unit can choose to perform a drop action at any point in time. As in the case of the pickup action, a unit must specify pairings of the form < type, quantity> for the items it wants to drop. Once the resources / items have been dropped, they will become visible to other units that come near the cell. This means that other units will be able to pick them up without any further effort other than the energy expended for the pickup action (unless there is a tower protecting them). This action has no associated energy cost. Moreover, should a unit be killed after an attack or retaliation, its items and resources will be dropped automatically.

View Each unit can see all cells in any direction with a distance of maximum 5 cells from the one the unit is in, and, can see through all types of cells. For each cell the unit sees, it gains the following information: terrain type, visible resources (dropped by other units), crafted items it contains (dropped by other units), any towers present in the cell, any units present in the cell. This action has no associated energy cost.

Craft Each unit can craft new items based on blueprints and resources. For more information see Crafting.

Research In order to craft better items, a unit from your team must research new blueprints by investing gold and energy into a research action. As a result, the entire team will receive a new blueprint containing information on how to build a new item. Each unit may then build the new item type, assuming it has the required resources.

Place trap This action crafts a trap and places it in the crafting unit's cell.

Place tower This action crafts a tower and places it in the crafting unit's cell.

Equip item Equips the specified item in the appropriate slot (either weapon or armor), moving the currently equipped item if any into the inventory.

Trade In order to trade items between units, a drop - pickup sequence must be used. Simply drop the desired items into a cell and pick them up with the appropriate unit.

Crafting

Constructing items is what helps the player attain greater scores, as well as improve units through better arms and armor. Unlike resources, crafted items are crafted using blueprints and cannot be found buried in cells. Items can be found at the surface, if dropped there by other units. Items may be traded between units on the same team.

Resources

The team controlled by the player has two kinds of resources available: the list of currently known blueprints and raw materials found on the map, acquired through the Pickup action. These resources can be used in order to craft items and improve your units' fighting strength. Raw materials come in several varieties, such as wood, iron, leather and so on. Blueprints require specific quantities of specific raw material types in order to work.

Blueprints

Blueprints give you knowledge about how to craft items. A blueprint specifies the list of required ingredients needed for creating a specific item. At the beginning of the game, only some basic blueprints are known. To reach higher levels, a unit from the team must expend energy and gold to research a technological advancement. Blueprints are shared between units in the same team.

Crafted items

Each unit may craft a variety of weapons and armor either to use itself or trade to other units in the team. In order to craft an item, a unit must submit the type of the target item it wants to build, and the list of pairings <resource type, quantity> / <item, quantity> that it wants to use in order to build the new artifact (the blueprint presents more than one way of building an item).

Weapons The specified weapon (according to the blueprint used) is created and placed in the unit's inventory. Resources are deducted as per blueprint specification. Weapons give an attack bonus.

Armor The specified armor (according to the blueprint used) is created and placed in the unit's inventory. Resources are deducted as per blueprint specification. Armors give a defense bonus.

Traps The specified trap is crafted and placed in the unit's cell. Resources are deducted as per blueprint specification. Traps may be used to freeze enemy units, making them unable to do any type of action for several rounds. Units are affected by a trap if they move to a cell with a trap in it.

Towers Defense towers may be used to slow down enemy units, making it easier to reach and attack them. A unit can opt to build a defense tower for strategic advantage. Each tower has a radius of action. It will drain the current energy levels of opposing units that fall within its reach. While draining a unit's energy levels the tower also gets weakened by the same amount of energy points it drains from a unit. When a tower's energy level drops below 0, it will be destroyed. The specified tower is crafted and placed in the unit's cell. Resources are deducted as per blueprint specification. No units may pass through a cell with a tower in it after it has been built.