### **Zarttech ESOP Design Decision**

* The Smart Contract Architecture follows a simple and straightforward architecture, with a single contract named EmployeeStockOptionPlan. It uses a mapping to store employee information and employs events to log important contract actions. The contract owner has exclusive access to certain functions through the use of modifiers.
* Access Control: The contract implements access control mechanisms to ensure that only the contract owner and authorized employees can perform certain actions. The onlyOwner modifier restricts specific functions to be called only by the contract owner, while the onlyEmployee modifier restricts functions to authorized employees.
* Data Structure: The contract defines a struct named Employee to store employee-related information. This struct includes fields such as grantAmount (number of granted options), vestedAmount (number of vested options), exercisedAmount (number of exercised options), vestingStart (vesting start timestamp), vestingDuration (vesting duration in seconds), and transferTo (address to which vested options can be transferred).
* Events: The contract emits events to provide transparency and enable easy tracking of important contract actions. Events such as StockOptionsGranted, VestingScheduleSet, OptionsExercised, and OptionsTransferred are emitted to log the grant of stock options, setting of vesting schedules, exercising of options, and transferring of options, respectively.
* Modifiers: Modifiers are used to enforce access control and simplify function implementation. The onlyOwner modifier ensures that only the contract owner can execute specific functions, while the onlyEmployee modifier restricts certain functions to authorized employees.
* Ownership: The contract assigns the address of the deployer as the contract owner in the constructor. This ensures that the contract owner has exclusive rights to grant stock options, set vesting schedules, and perform other owner-specific actions.
* Vesting Schedule: The contract allows the company to set a vesting schedule for each employee's options. The vesting schedule includes the vesting start timestamp and vesting duration. This ensures that employees can exercise their options only after a specified period, promoting long-term commitment and alignment of interests.
* Transferability: The contract enables the transfer of vested options from one employee to another eligible employee. The transferOptions function facilitates this transfer, subject to any transfer restrictions specified in the vesting schedule. Transferred options are accounted for in the respective employee's vested options balance.
* Code Readability: The code includes comments where necessary to improve code readability and maintainability. Code comments explain the purpose and functionality of functions, modifiers, and events, making it easier for developers to understand and modify the contract if required.

These design decisions aim to provide a secure, flexible, and transparent Employee Stock Option Plan smart contract.