

## Contents

Who are Collective Intelligence Systems? .....	2
What is the main business of CIS Systems Ltd? .....	2
What HE Experience do you have? .....	2
What functionality does CI-Connect offer? .....	3
How do you meet UKVI Assurance? .....	4
Has CI-Connect been audited by UKVI? .....	4
What Resources are available for Implementation? .....	4
Project Management .....	4
Technical Resources available .....	4
How does CI-Connect integrate with other systems? .....	5
Student Data .....	5
Timetabling .....	5
Staff Data .....	5
Access Control.....	6
How is Attendance Data Collected? .....	6
How often are new releases made? .....	6
What does the system Architecture look like? .....	7
Where is the Cloud Hosting .....	8
How do you provide Customer Support .....	8
Can the system reduce administration time for academic and administration staff? .....	8
How we address Sustainability? .....	9
Case Study.....	10

## Who are Collective Intelligence Systems?

CIS was formed in 2012 and draws on the experience of a software house established for over 30 years two HE specialists with over 35 years of combined experience in Higher Education and an IT leader now involved in HE solutions. This combined experience has formed a company that understands the sector and the need to provide reliable cost effective solutions.

## What is the main business of CIS Systems Ltd?

The focus for CIS Systems has been the creation of CI-Connect. A post-arrival student management system with the initial focus being on attendance management.

*“Connect has greatly improved the quality, speed and efficiency of our information management. It provides users with instant access to key information and is a comprehensive academic management system. It is intuitive, flexible and easy to use.”*

Attendance management is a key tool to improving student retention and progression, and our approach offers major potential benefits in terms of the student perception by introducing student engagement via an app and notifications.

We believe there are wider opportunities in the HE market where our expertise can provide targeted improvements in HE business processes and systems. This enables institutions to make major improvements in business processes without the wholesale replacements of their existing systems, typically student records, timetabling, facilities management etc.

The solution has been developed ‘in the cloud for the cloud’ to allow for affordable and rapid deployment. Our vision for CI-Connect is to provide a simple system to help solve complex problems.

## What HE Experience do you have?

Patrick Kennedy and Emma Richardson have worked in the Higher Education sector for a number of years and are now established consultants. With Geoff Lester, an IT leader in the commercial sector they have worked together on a number of projects within HE over the past few years, with some 15 clients in the sector. These have covered a range of client needs, which have been strategic and operational, spanning the areas of strategic planning, performance intelligence, business process and systems implementation. The insights gained into the rapid evolution of HE from this experience have been invaluable in developing CI-Connect. Our intimate knowledge of the sector will continue to inform our services and product development.

## What functionality does CI-Connect offer?

CI-Connect presents to its users, student information provided by the core student record system (typically SITS or Banner), timetable, staff and curriculum data which is transferred via automated interfaces or csv imports. It provides the following functionality:

- Store the course structure including the modules and sessions associated with each course.
- Specify which sessions require attendance to be recorded.
- Integrate student data through an API connection.
- Set up teaching groups for each session to identify the students that should be present at each session. This information will provide a personal up-to-date timetable for the student which can be accessed on-line or by mobile phone.
- Record the attendance at sessions with a variety of methods – from taking the register online, bar code scanning, electronic chip devices and mobile phone input. Any combination of these devices is permitted within an organisation. Our approach provides a flexible solution minimising initial costs and speeding implementation.
- Record late attendance at sessions.
- Monitor the completion of registers by staff and highlight to them where action is needed to address incomplete registers.
- Set attendance targets.
- Monitor minors.
- Record other interactions with the student as well as attendance
- Record the delivery of and marks achieved for set pieces of work.
- Record the outcome of meetings with students and steps taken to address low performance in terms of attendance and academic performance.
- Record other events e.g. UKVI workshops, field trips, social events
- Contact students on their attendance and retain information provided.
- Record absence and associated documentation.
- Temporary teachers allows teachers to be set up in advance of organisation access being provided to ensure that academic staff can access the system and reduce the need for manual registers to be taken. It also allows cover teachers to take a register without the need for an administration intervention.
- To ensure that data is able to be current, the system manages the live schedule. Any changes can be managed within the system allowing changes to rooms, teachers, and cancellations.
- Effectivity dates allow students to be moved between groups in advance or retrospectively to ensure that attendance is accurate.
- A mail merge reporting facility allows administrators to manage student communication and put control of this information into the hands of administrators. These can be produced electronically or in printed form.
- Multi campus administration by a single team.

## How do you meet UKVI Assurance?

With UKVI requiring institutions to prove that students are engaging in their studies, CI-Connect has been built with the foundations of attendance management providing a system that is robust, yet technology agnostic to capture student attendance. The system allows the UKVI requirements to be exceeded if required, but to be flexible to allow all types of student engagement to be captured and a number of different checks and balances to be used. It also recognises that student retention and progression is fundamental to a HEI's success and we have designed the system to allow for the capture of all this information alongside the core requirement to meet the UKVI trusted status.

## Has CI-Connect been audited by UKVI?

CI-Connect has been audited by UKVI. This is a quote from one INTO centre who received an unexpected visit in September 2014:

*"Yesterday, with impeccable timing since we are still in the midst of arrivals, we had an unannounced visit from UKVI. It was a routine visit, triggered by our application to have our Highly Trusted Sponsor status renewed. However, the depth and scope of the visit was greater than in the past and we think that this signals a clear UKVI intent to look at all colleges with a higher degree of scrutiny. They looked at all area in a lot more detail than previously, which was why they sent 3 people instead of 1 as in the past. They were expecting to be with us for 2 days but, as we were able to retrieve most of what they wanted very quickly, stayed only for 5 hours. Having systems such as INTO Connect also impressed them."*

## What Resources are available for Implementation?

We appreciate from our own client-side experience just how important it is from the outset to create a set of working relationships that will (as far as both CIS and the University can possibly assure) remain in place for the entirety of the project. On that basis, we would want to provide assurance to you that the project lead would remain so for the project duration.

CIS will provide the following resources to ensure the highest quality implementation:

### Project Management

There are currently 3 HE specialists who provide project management support.

- To manage the requirement gathering
- Understand current processes and issues
- Assist in the definition of the use cases
- User training
- System configuration and implementation of the system alongside University staff
- Ongoing support
- Managing change

### Technical Resources available

- A team of 7 provide infrastructure support for the deployment of the system
- The Customer Support team of 11 support the implementation and ongoing use of the product
- A Development Manager would manage and oversee required developments
- There are currently in excess of 30 Development staff within the business. Currently 3 developers are working full time on the development of the core system.

## How does CI-Connect integrate with other systems?

The fundamental design and system architecture of CI Connect is to support real time integration into a multitude of systems enabling data to pass in and out of the system seamlessly. There are a variety of options that have currently been used with API integration for student and course data. Equally data can be imported through controlled csv files with error checking built in.

CI Connect's offering is based on providing niche solutions tightly integrated with existing core systems enabling institutions to make rapid improvements in their business processes without wholesale system replacement. The fundamental design and system architecture of CI-Connect is to support real time integration into a multitude of systems enabling data to pass in and out of the system seamlessly. We are extremely confident that working with internal IT staff and 3rd party suppliers we can integrate with any systems platform.

Systems integration is a key competence within our partner business who operate in commercial print and the highly automated packaging market sectors. It is routine to have extensive integration with all business systems. Reliability is fundamental to business success in this market sector and in many cases packaging plants operate 24 hours.

### Student Data

Our client INTO, required integration with Salesforce.com, their cloud based CRM system that manages the enquiry, application through to arrivals for their student data. An API is provided to manage student and course data from Salesforce.com to CI Connect.

In this case the customer wished to push the data to CI Connect, and had some specific technical requirements due to the nature of the applications involved, because of this we agreed on a SOAP service layer, operating over SSL and using key based authentication between existing on premise systems and CI-Connect's cloud structure. The services are implemented above CI-Connect's validation, caching and trigger layer and so remain performant and reliable.

Where possible/appropriate we have also used RESTful services, and within the development team we have extensive experience in implementing and consuming REST services.

### Timetabling

Data from the timetabling activity is provided through an upload facility. The data that is used in this upload facility is provided from a variety of timetabling solutions both Facility and manual excel files.

The imports are only available to an Active Directory authenticated user, and based on their permissions they upload an excel document to cloud storage using a user friendly interface that uses http chunked upload via ajax to report on progress. The file is then validated and any issues shown to the user in a grid that previews the results of the import.

This could be provided through an API integration facility.

### Staff Data

This is currently not imported, its setup via the temp teacher utility, and then a little bit of data is added via ACS when they first log in. This could be populated via an API

## **Access Control**

Login into Connect is via Azure Access Control Services (ACS) enabling the option of on premise or cloud based Active Directory authentication amongst others.

## **How is Attendance Data Collected?**

CI-Connect attendance management is technology agnostic. Attendance data supports a wide range of recording methods concurrently – from paper recording, bar codes, chip devices, finger print scanning and mobile phone apps. With campuses which may include multiple locations, we are aware that there may not be a single platform across all of their departments and campuses. Our approach enables an institution to take an assorted approach to attendance data collection if the landscape requires. As part of this flexible approach we are currently developing proximity technology using the students mobile phone and ibeacons. This enables a student to record her attendance using a contactless technology at very low costs (<£40) per room. This is a significantly more modest approach than the installation of biometric devices and can be mobile so doesn't have to be fixed to locations.

## **How often are new releases made?**

We have a continual development policy which ensures that systems are constantly improved and benefit from additional functionality. New releases are quarterly currently while we are still developing new functionality. It is important to remember that all upgrades are performed by the support team. CIS takes the responsibility of getting your system back on-line.

We anticipate that as the user base of CI-Connect grows, we will hold regular user meetings so that institutions can share their experiences and steer the development path.

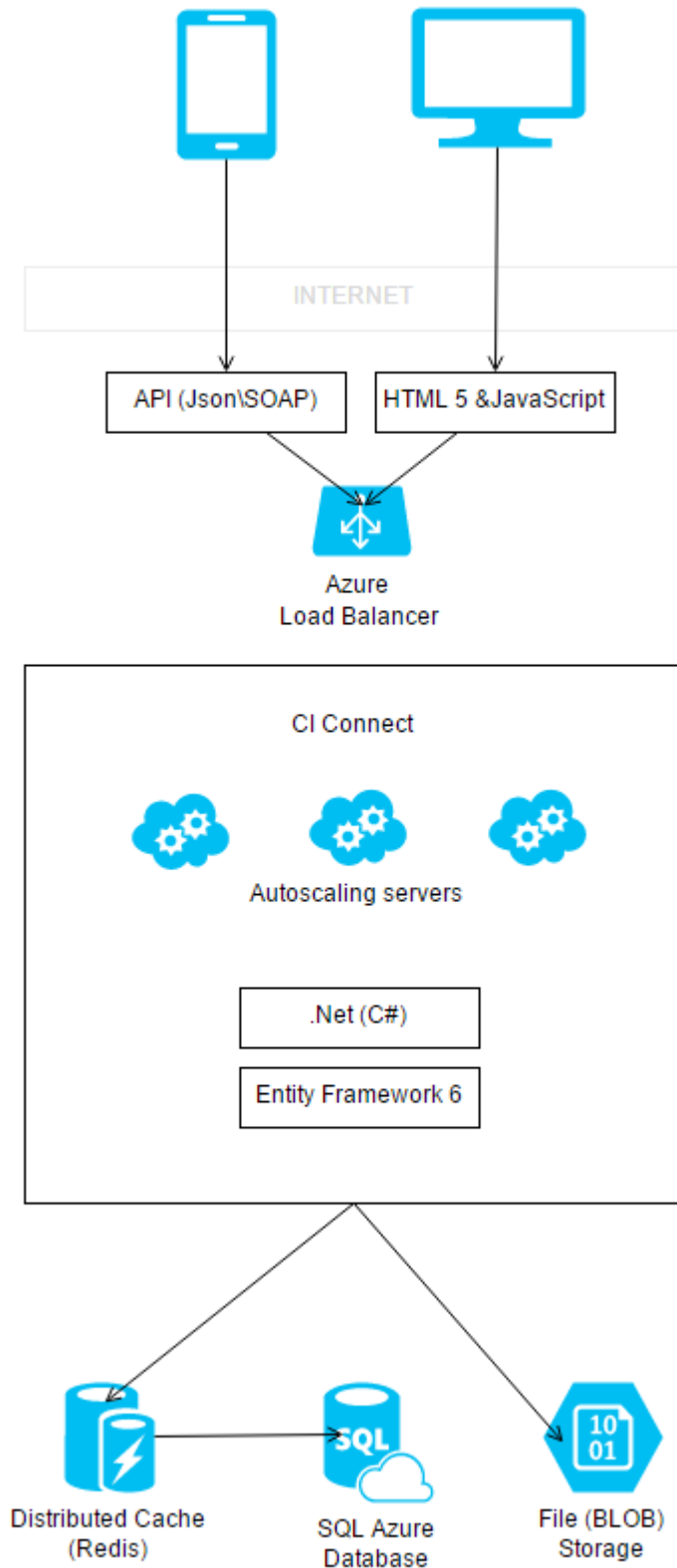
## **How is the system performance monitoring carried out?**

The system uses Microsoft Azure monitoring to ensure optimum performance. Typically Azure can be configured to scale dynamically based on actual load, firing up extra resources for peaks and releasing them after the load has subsided.

KPI's such as CPU (or DTUs on the database), Data IO, Cache hits\misses, Long running queries & storage status are monitored using either Azure's built in monitoring or custom scripts. Once a threshold is hit a notification is fired to the support team, who will use custom scripts and queries to track the incident, working with the development team as required to reach a quick resolution.

## What does the system Architecture look like?

The system is designed to run on top of Microsoft Azure, but can be installed in a private Azure instance or on-premise if required. When running on azure we take advantage of the 'elastic' resources the system provides, using multiple server resources that can auto-scale in response to the load. A sophisticated distributed cache layer is based on top of Redis to ensure optimum resilience.



## Where is the Cloud Hosting

Current cloud hosting is set across Western Europe. This is the customer's choice, it is possible to choose the region nearest to you, or have several. It can even be mirrored across regions.

## How do you provide Customer Support

All CIS clients will have an Account Manager who will maintain regular contact and will act as the first point of escalation.

Part of the ongoing support and maintenance contract will be an agreed SLA with varying agreed response times depending on the urgency of the call. The resolution rate being achieved by the business as a whole is at 89% (within 24 hours).

All support calls for CI-Connect are routed to the 11 strong Shuttleworth Support Team. Our experience with CI-Connect to date is that call levels are low, which is partly a function of the intuitive user-friendly software, partly because the solution is robust, and also that INTO have an in-house resource that offers in-house support. However, the Support Team is dedicated to providing a service that will ensure that your organisation can perform at its optimum level whether your question or query is hardware or software related.

At the heart of the support process is an Automated Call Management System. Incidents are logged either via e mail, online or by phone. A log number is generated and communicated back to the client automatically. First line support will attempt to resolve the issue either through a phone call or email. If the issue cannot be resolved or the SLA period is exceeded the issue moves to second line support where further investigation takes place. Resolution follows or escalation to Development. The Support Database has browser access and enables clients to see the status of all their contacts with Support and whether issues have been escalated. A real time analysis of the numbers and types of call that are being made is available. Importantly every client can see a summary of the time that it takes the support team to resolve their questions according to the degree of urgency that was placed on the call in the first instance. Our performance will be reviewed by the Project Lead on a monthly basis against the agreed SLA.

## Can the system reduce administration time for academic and administration staff?

CI-Connect enables an institution to progress from paper based registers to automated data collection using a variety of automated data collection technology – from bar codes to mobile phone apps, and as a result:

- Academic staff can very quickly take registers and focus on the delivery of their session with the minimum of disruption.
- Administration staff are no longer needing to spend time updating spreadsheets and filing documents. The data is stored securely and the user configurable reporting tools enable ready analysis.

Management can have direct oversight of:

- Levels of attendance by course /module/lecturer over any given period
- Registers that are outstanding – a measure of attendance data validity.
- A clear set of use cases to be met to ensure the benefits are fully delivered.



## How we address Sustainability?

**Social** – The support desk is the long term contact point behind CI-Connect and is UK based. It is staffed by highly motivated staff with a very low rate of staff turnover.

**Economic** – The commercial and industrial background of the CIS directors brings a wider view of benefits and costs of informational technology. CIS Systems Ltd is committed to delivering systems with a rapid return on investment for our clients. CI-Connect can be provided as ‘software as a service’ reducing both initial capital outlay and reducing risk for an organisation. Our licensing model is based on the number of students registered on the system and costs flex as those numbers change.

**Environmental** – The CI-Connect Cloud based solution offers a flexible highly resilient platform which requires no hardware purchase by the institution achieving both environmental and economic benefits. CI Connect is a true cloud product which enables the hardware power and energy to be turned up and down as is required by the application. This ‘elastic’ computing is highly energy efficient. There are obvious economic and energy savings that could be achieved, as there is no server hardware required, no space for those servers and therefore no requirement to remove the heat generated by those servers. Research has shown that the carbon footprint of cloud computing is significantly less than on premise solutions.

## Case Study

Our client, INTO University Partnerships, is a growing education provider for around 5,000 overseas students in the UK, in partnership with 9 universities. The initial contract was awarded in November 2012. The initial development contract was for a six figure sum. This has been extended every six months and continues to be so.

INTO is a complex business that operates 13 teaching centres in the UK. The majority of these centres are joint ventures with UK universities. UKVI status is fundamental to INTO's business and their objective was to replace their existing system with something more effective and easier to operate. As part of a review of their systems, finding a flexible approach to attendance management which was both quick and easy to deploy and allowed flexibility in approach was difficult to source, so the review recommended a self-build. CIS responded to that requirement and was successful in receiving the contract to provide the requisite solution.

Attendance Management has been at the heart of the solution provided to INTO. They currently exceed the UKVI requirements and monitor attendance to all their study sessions. Over 100,000 attendance transactions per month are generated

'Widgets' have been developed in the system to provide users with summary information of their current responsibility. A teaching member of staff will log in and see their current sessions, their outstanding registers, required to be taken within 24 hours of the session or their outstanding registers with minors on, required within 4 hours of the session being taken. All these parameters are configurable but ensure that users are aware of the data that is in their control and ensure they have easy access to ensure it is up to date. The system is built in a way that allows specific types of sessions or just a proportion of a session to require attendance. It also has the capability to record attendance for any other sessions or event that an organisation requires to set up and maintain. This would allow different interactions with the student to be recorded as a contact point e.g. exams, other non-study sessions where the contact is recorded e.g. UKVI workshop.

Throughout the development, both parties have worked together to produce a solution which is valuable to any HE organisation. As part of the agreement with INTO, the intellectual property rights are retained by CIS. INTO recognises the benefits of a wide customer base for the product and are happy to provide references.

After 18 months of operation, INTO regard CI-Connect as fundamental to their operating efficiency, and made a decision to de-commission their SITS implementation. INTO are engaged in driving improvements in their business processes using information provided by CI-Connect. They are continuing to invest in CI-Connect and additional functionality now includes:

- Attendance management including absence management and monitoring minors
- Schedule Management
- Student Profile
- Uploading of documents
- Storage of marks
- Recording of any interactions with students
- Progression
- Teacher Utilisation
- Student Reports to allow the production of reports for varying different student requirements e.g. sponsor reports

- A mobile phone application is in development offering an extremely efficient attendance data collection tool and a means of establishing two way communications with students

CI-Connect is Cloud based and the Microsoft Azure platform has proven to be extremely responsive and resilient - there have been no service interruptions during over 18 months of operation. All technical upgrades are carried out by CIS, no in-house technical resource is required unless changes to interfaces are specified.

The initial highly demanding development timetable was completed on time and pilot implementation in two centres was completed 4 months after signing of contracts. The implementation was extended to all 13 centres through the year and functionality continues to be developed. The implementation was managed by a small project team. Project Management was provided by Emma Richardson as an external consultant on a part time basis, system training and implementation was provide by their single central support person and consultation and user engagement was carried out the Head of their Business Systems. Each centre has a lead user and two pilot centres were agreed to lead the implementation. Use cases have been successfully deployed as part of the business requirement process and then for use in testing and support of the system in an operational environment. This has helped in focussing users on the scenarios they need to achieve and ensure the system can meet their requirements.

INTO decided to handle first line support calls. This is managed by a single central person who provides training, first line support, user testing, assists with system functionality specification, use case writing and implementation of new functionality. The web-based interface has enabled users to quickly become familiar with the system and the resource needed for implementation and on-going support has proven to very modest.

CIS provided dedicated development resource staff, who work closely with INTO in-house IT staff on the technical specification and integration and. INTO were extremely demanding in terms of the technical specification and the result has been a flexible development framework which enables enhancements to be implemented quickly and securely. On-going developments are released 4 times per year and all enhancements are tracked using JIRA, project tracking software.