The ScholarChip School Climate Software and Components (SC³)
Introduction

Schools are aware of the importance of school climate as a factor in providing quality education. The term *school climate* includes three basic categories, one of which is the orderliness of the environment and the clarity of rules. This category may include a variety of metrics and events such as attendance, student safety, hall traffic, noise and adherence to school rules. Many states have moved to make attendance a learning metric, along with traditional subjects such as language and mathematics. Some large urban districts have gone as far as creating positions of “School Climate Officers” to monitor and improve these metrics. The goal of all these steps is to achieve what is universally recognized: a safe and quiet school environment is critical to learning and consistent attendance and student accountability are the first steps in this process.

This white paper outlines the ScholarChip Platform for attendance, hall monitoring, student safety, student privacy and food and library services. ScholarChip is a leader in recognizing this emerging area and providing the right combination of both hardware and software to manage aspects of school climate without taxing the local school infrastructure. The platform is both simple to adopt and use as a result, rather than in spite of, the extreme sophistication of the technology employed. The platform is an enterprise-class hardware and software configuration that recognizes the unique needs of K-12 schools and makes no compromises in delivering the best-of-breed solutions.

Uses of the ScholarChip Platform

Schools use the ScholarChip Platform in a variety of ways. The versatility and ubiquity of the platform makes it easy for any school to custom fit the components to the needs of the school. Typically, the ScholarChip Platform:

**Secure ID**

- Provides secure, highly private, smart card IDs to all students and staff. The one smart card can serve all needs ranging from attendance, food services and library to emergency and locker management.

**Automated Attendance**

- Automatically and rapidly collects fine-grained attendance at multiple locations and times during the school day, both on and off campus.
- Reduces truancy through effective reporting and attendance monitoring.

**Reduced Truancy**

- Safeguards student safety through automated control and monitoring of school entry and egress.
- Automates documentation and monitoring of discipline events. From the most minor to the most serious infractions in order to anticipate potential problems and rectify existing ones.
- Provides effective emergency management through locating of all students both on and off campus.
Emergency Response

Data Warehousing

- Creates portable student emergency contact information for “anywhere” access.
- Utilizes over 400 reports from the data warehouse to review school data for monitoring of trends, issues and remedies.

The ScholarChip Platform

The ScholarChip Platform is a combination of advanced hardware and software tools designed to monitor and improve the various metrics of the school climate. The platform is unique in that it is designed from the ground-up for these tasks and is not a series of add-ons to other school software packages. The platform is thorough, robust, reliable and integrated; providing a multitude of services in an Application Service Provider (ASP) model. This minimizes the impact on school resources and staff and allows for rapid adoptions, installation and training.

Platform Architecture

The ScholarChip Platform has a three tier architecture to allow flexible deployment, high performance and robust redundancy. Since the platform requires zero administration from the schools and is delivered as an Application Service Provider (ASP) model, rapid implementation is matched to real-time monitoring by ScholarChip with a guarantee of 99.9% up-time.

The three tiers of the ScholarChip Platform are:

- **Tier I.** This is the data center Tier where all data resides on replicated relational database servers (Oracle) and where the ScholarChip Identity and Climate web-based application is serviced. The data warehouse also resides on Tier I. Tier I is physically resident in a high security data center located at 111 8th Ave in New York City and serviced by multiple cross-connect OC3 fiber optic links to the Internet. The data center is CISP certified for high security suitable to financial and other similar transactions. Access to the data center is restricted through three sequential access points with 24-hour guards and biometric controls.

- **Tier II.** This is the in-school device tier. All appliances in the school communicate with Tier I via secure web services over standard ports. This means that the installation of the ScholarChip system requires no complicated changes in firewall configurations at the school level, yet remains secure and authenticated. This major technological advance ensures that school installations are simple and quick. ScholarChip has been installed in 65 schools in 4 weeks in the City of Philadelphia.
- **Tier III.** This is the smart card tier carried by all students and staff. The smart card has on-board memory and processing which means that the overall system is inherently secure at all hardware levels.
Platform Hardware Components

The platform has a suite of hardware components, supported by advanced web-based software, to handle all contingencies and to allow a build-as-you-grow model of adoption. The hardware components include:

The ScholarChip Contactless Smart Card. This card is issued to all school community members, students, teachers and staff in order to provide them with a secure hardware token for physical identification and electronic transactions. ScholarChip is a leader in providing K-12 schools with robust, proven, low-cost smart cards. ScholarChip is also a leader in the emerging field of contactless smart cards, being one of the largest issuers of such cards in the United States. The cards are normally issued to students at the beginning of the school year and at other times as needed. The cards are the same size and composition as standard plastic credit and bank cards but with an on-board computer chip capable of storing and processing data. The cards are passive, requiring no batteries (they are powered by the card reader), and are proven to be “school robust”. The ScholarChip cards adhere to the ISO standard 14443A and are automatically personalized and programmed using the ScholarChip Photography and Card Issuance System. Card issuance is simple and rapid, up to 200 cards per hour fully programmed on a single issuance station.

The ScholarChip Building Attendance Kiosk. This device, available in a variety of physical formats matched exactly to the school’s needs, allows for students to check-in and check-out of the school building by merely tapping their card at the kiosk. The automated attendance taking is rapid (up to 40 students per minute per kiosk) and allows the school administrators to determine exactly which students are in the building or absent. When used with classroom attendance and then handheld hall monitoring appliance, the kiosks are an effective means of both taking attendance and enhancing students’ accountability. Schools with an open campus policy for all or some of the students are able to view, in real-time, all students who are on or off campus. This provides a higher level of security and accountability.

The ScholarChip Wall Mounted Attendance Appliance. The ScholarChip Wall Mounted Attendance Board allows schools to visually monitor the students presence in school based on building entry/egress. As students tap in or out using their ScholarChip Smart ID card, their attendance is updated on the ScholarChip Management Site and their picture display changes.

The ScholarChip School Bus Attendance Appliance. This appliance, mounted on a school bus, allows for attendance taking in real-time as students board the bus. Since the unit is GPS-capable and communicates with the ScholarChip Tier I data center in near to real-time, it is possible for the school to have a complete inventory of the location of all students prior to arriving at school and immediately upon boarding the bus. The transportation appliance is a unique addition to the school attendance system that simultaneously enhances student safety and school attendance. The
appliance can alert bus drivers to students boarding the wrong bus or to students who have missed their regular bus stop.

The ScholarChip Handheld Hall Monitoring Appliance. This device, similar in size and weight to a cell phone or a PDA, allows hall monitors, teachers and school administrators to view student schedules, emergency contact information, medical conditions, take attendance and enter disciplinary events by merely tapping the student’s card against the device. This device can be used in a variety of situations and environments to allow on campus and off-campus monitoring of students.

The ScholarChip Automated Card-based Classroom Attendance System. This device allows any classroom with a computer to be used as an automated card-based attendance system. It is superior to many of the web-based attendance “pages” now in vogue among the many Student Management Systems since it requires no teacher intervention and is faster, resulting in more time on tasks at hand in each class. The automated attendance is particularly useful in large classrooms, such as music, band, physical education or auditorium programs.

The ScholarChip Secure Door Access System. This appliance controls door entry through the use of the ScholarChip contactless smart card. It is generally suitable for certain limited access areas such as bathrooms, pools, faculty areas and similar locations. The device utilizes standard door strikes and can be programmed from the ScholarChip Management Site to allow or block specific groups or individuals.

The ScholarChip Photography and Card Issuance Station. This station allows schools to easily and automatically issue cards to students using server-based templates. The chip on the card is programmed automatically. All information is derived from the server and no data entry is required. The card issuance is the most advanced smart card ID system of its kind and has demonstrated both speed and robustness under all conditions.

The ScholarChip Paper Attendance Scan System (PASS). This system is targeted at schools without classroom computers or when the school requires a paper record of attendance. The platform uses standard white sheets for entry of student attendance. The sheets are generated in real-time from classroom rosters and can be printed on the supplied printer or any standard laser printer. The optical scanning system and associated Optical Character Recognition system (OCR) are server-based, allowing rapid scanning, attendance taking and correction. On a typical school day the ScholarChip servers will read and process thousands of paper scan records to augment the electronic classroom attendance records.
**Platform Software Components**

A major strength of the ScholarChip Platform is the software back end which provides users with the capability to view, control and analyze climate events. The software back end uses advanced relational databases and data warehousing engines (Oracle) to provide schools with business intelligence to manage the diverse needs of students, especially in the areas of attendance, discipline, safety, document management and reporting.

The end-user will generally interact with two major software subsystems:

**The Management Site.** This is an advanced web-based application allowing card issuance, building and classroom attendance monitoring, hardware monitoring, discipline events creation and reporting, classroom attendance, safety events, and food and library services. The application is hosted at the ScholarChip Tier I data center and is delivered via any standard web browser on any major platform, including Windows, Apple and UNIX. The system can support any number of users and schools can be grouped in hierarchies to resemble the real-life situations of schools, districts as well as regional and urban groupings. Users can be assigned to various security levels that control application tasks. The application is also delivered with 99.9% guarantee up time on a 24x7x365 basis. Advanced network and load balancing architecture, typical on any enterprise-class application, guarantee both security and up-time.

**The ScholarChip Data Warehouse and Reporting System.** This is an advanced data warehousing and reporting system designed to provide schools with the reporting necessary to detect trends, monitor in-school behavior of students and respond proactively to any discipline, attendance or other similar issues.

The ScholarChip Platform provides a complete solution for school climate incorporating smart card ID, automated attendance, bus attendance, hall monitoring and emergency management. The Application Service Provider (ASP) model of the platform is an ideal way for schools to implement the system without taxing school resources.

**About ScholarChip**

ScholarChip was founded in 2000 by Dr. Maged Atiya to provide digital identity and smart card solutions. Prior to founding ScholarChip, Dr. Atiya was a Senior Physicist at Brookhaven National Laboratory on Long Island and Assistant Professor of Physics at Columbia University.

ScholarChip has grown rapidly in the last few years to become one of the largest smart card issuers in the US. It currently serves 70 secondary and 400 post-secondary educational institutions, providing smart card attendance systems, digital signatures, financial aid and secure payment gateways. ScholarChip operates a 10,000 sq. ft. development facility on Long Island and also has satellite offices in New York City and Philadelphia.